МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
Донецький національний університет
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імені Михайла Туган-Барановського

Кафедра іноземної філології,
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МЕТОДИЧНІ РЕКОМЕНДАЦІЇ З ВИВЧЕННЯ ДИСЦИПЛІНИ

ПЕРЕКЛАД НАУКОВО-ТЕХНІЧНОЇ ЛІТЕРАТУРИ

ступінь: бакалавр

Кривий Ріг
2022

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Затверджено на засіданні
кафедри іноземної філології, українознавства та соціально-правових дисциплін
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В 76

Воробйова Л. В., Остапенко С. А., Герасименко О. Ю.

В 76 Методичні рекомендації з вивчення дисципліни «Переклад науково-технічної літератури», ступінь бакалавр. Кривий Ріг : ДонНУЕТ, 2022. 121 с.

Запропонована методична розробка сприятиме формуванню практичних навичок, необхідних для здійснення аналізу оригінальних текстів і адекватного перекладу науково-технічної літератури. Робота містить вправи за темами, які надають можливість проаналізувати труднощі передачі прагматичної специфіки оригіналу при перекладі та встановити шляхи подолання перекладацьких труднощів, пов’язаних з лінгвальними та граматичними факторами.

Методичні рекомендації відповідають сучасним методичним вимогам до навчальної літератури.

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ЗМІСТ / CONTENTS

ВСТУП / INTRODUCTION

Потік наукової інформації, що постійно зростає, обмін інформацією між фахівцями різних галузей і організація міжнародних симпозіумів і конференцій потребують активної роботи кваліфікованих перекладачів. Курс «Переклад науково-технічної літератури» є складовою циклу професійно орієнтованих вибіркових дисциплін, які вивчають студенти спеціальності «Германські мови та літератури (переклад включно)».

Курс «Переклад науково-технічної літератури» у взаємодії з іншими теоретичними курсами розширює лінгвістичний світогляд студентів, створює теоретичну основу для набуття практичних навичок та умінь у галузі перекладу, поглиблює їхню практичну мовну підготовку.

Мета курсу – формування практичних навичок, необхідних для здійснення аналізу оригінальних текстів і адекватного перекладу науково-технічної літератури

Завданнями к**урсу** є:

- ознайомити студентів з теоретичними положеннями дисципліни;
- визначити жанрово-стилістичні особливості науково-технічних текстів, встановити їх мовні маркери;
- встановити лексичну, морфологічну, синтаксичну своєрідність англійських науково-технічних текстів;
- розглянути основні вимоги до перекладу науково-технічної літератури;
- ознайомити студентів з видами технічного перекладу;
- встановити шляхи подолання перекладацьких труднощів, пов’язаних з лінгвальними факторами;
- проаналізувати труднощі передачі прагматичної специфіки оригіналу при перекладі.

У результаті вивчення навчальної дисципліни студент повинен

знати:

- основні теоретичні положення дисципліни;
- особливості дискурсу науково-технічного спілкування в англійській та українській мовах;
- основні принципи передачі в перекладі лексико-граматичних та жанрово-стилістичних особливостей матеріалів сфери науки і техніки.

вміти:

- використовувати в процесі перекладу засвоєні прийоми та способи відтворення лексико-граматичних та жанрово-стилістичних особливостей науково-технічних текстів;
- використовувати на практиці широко вживані перекладацькі прийоми (вилучення, доповнення, конкретизація, транскодування, калькування тощо), які мають місце при перекладі науково-технічних текстів;
- передавати в перекладі стиль оригіналу.

Зміст практичних занять складається з вивчення лексики, виконання перекладів з української мови на англійську і навпаки науково-технічних текстів з різних напрямків: електроніки, радіотехніки, машинобудування, медицини, хімічної промисловості, металургії тощо. Текстовий матеріал має оригінальний неадаптований характер. Процес виконання завдань залучає розгляд основних лексико-граматичних особливостей стиля науково-технічної літератури та засобів її відтворення у перекладі.

Методичні вказівки складаються з восьми розділів і містять вправи за темами, які надають можливість проаналізувати труднощі передачі прагматичної специфіки оригіналу при перекладі та встановити шляхи подолання перекладацьких труднощів, пов’язаних з лінгвальними та граматичними факторами.

ЧАСТИНА 1.
ЗАГАЛЬНІ РЕКОМЕНДАЦІЇ ЩОДО ВИВЧЕННЯ ДИСЦИПЛІНИ

PART 1.
GENERAL STUDY GUIDE

1. Опис дисципліни

Найменування показників	Характеристика дисципліни
Обов'язкова / вибіркова дисципліна	Обовязкова для ЗВО спеціальності 035 «Філологія»
Семестр	6
Кількість кредитів	5
Загальна кількість годин	150
Кількість змістових модулів	3
Лекції, годин	-
Практичні/ семінарські, годин	64
Лабораторні, годин	-
Самостійна робота, годин	86
Тижневих годин для денної форми навчання:	
аудиторних	4
самостійної роботи студента	5.4
Вид контролю	залік

2. Мета та завдання дисципліни

Мета - формування практичних навичок, необхідних для здійснення аналізу оригінальних текстів і адекватного перекладу науково-технічної літератури.

Завдання - ознайомити студентів з теоретичними положеннями дисципліни; визначити жанрово-стилістичні особливості науково-технічних текстів, встановити їх мовні маркери; встановити лексичну, морфологічну, синтаксичну своєрідність англійських науково-технічних текстів; розглянути основні вимоги до перекладу науково-технічної літератури; ознайомити студентів з різновидами технічного перекладу; встановити шляхи подолання перекладацьких труднощів, пов’язаних з лінгвальними факторами; проаналізувати труднощі передачі прагматичної специфіки оригіналу при перекладі.

Предмет – засоби науково-технічного перекладу

Зміст дисципліни розкривається в темах:

Тема 1. Соціофункціональна характеристика науково-технічного дискурсу
Тема 2. Основні положення перекладу науково-технічної літератури
Тема 3. Лексичні особливості стиля науково-технічної літератури
Тема 4. Стандартизація термінології
Тема 5. Граматичні особливості стиля науково-технічної літератури
Тема 6. Синтаксичні засоби науково-технічних текстів
Тема 7. Переклад наукової статті
Тема 8. Специфіка використання спеціалізованих словників

Опанування дисципліни дозволяє забезпечити:

формування:

загальних програмних компетентностей:

здатність спілкуватися англійською мовою як усно, так і письмово;

здатність до абстрактного мислення, аналізу та синтезу;

здатність застосовувати знання у практичних ситуаціях;

здатність вчитися і оволодівати сучасними знаннями;

здатність до пошуку, оброблення та аналізу інформації з різних джерел;

здатність генерувати нові ідеї (креативність);

здатність працювати в команді та автономно;

здатність діяти на основі етичних міркувань (мотивів);

здатність діяти соціально відповідально та свідомо;

здатність використовувати інформаційні і комунікаційні технології.

фахових програмних компетентностей:

здатність вільно, гнучко і ефективно використовувати англійську мову, в усній та письмовій формі, у офіційному, неофіційному, та нейтральному регістрах спілкування, для розв'язання завдань у науковій сфері життя;

здатність до збирання й аналізу, систематизації, інтерпретації та перекладу текстів технічної документації;

здатність здійснювати перекладацьку діяльність різних видів;

здатність усвідомлювати термінологію наукового стилю та вміння застосовувати її у процесі перекладу;

здатність вільно оперувати спеціальною термінологією для розв'язання професійних завдань;

здатність аналізувати та розуміти ситуацію на ринку перекладацьких послуг з урахуванням вимог до роботи перекладача, професійного стандарту.

2) досягнення **програмних результатів навчання:**

вільно спілкуватися з професійних питань англійською мовою усно й письмово, використовувати її для організації ефективної міжкультурної комунікації;

ефективно працювати з інформацією: добирати необхідну інформацію з різних джерел, зокрема з фахової літератури та електронних баз, критично аналізувати й інтерпретувати її, впорядковувати, класифікувати й систематизувати;

відшуковувати необхідні дані в довідковій літературі, базах даних та інших джерелах, аналізувати та оцінювати ці дані, систематизувати й упорядковувати інформацію для вирішення комплексних задач професійної діяльності;

знати принципи, технології і прийоми створення усних і письмових текстів наукового стилю англійською мовою;

усвідомлювати важливість ролі перекладача та принципів професійної діяльності;

аналізувати лексичні одиниці, визначати їхню взаємодію та характеризувати мовні явища і процеси, що їх зумовлюють;

забезпечення міжмовної та міжкультурної усної та письмової комунікації та міжмовного і міжкультурного обміну інформацією в різних галузях шляхом перекладу різноманітних за змістом та жанром текстів іноземною (іноземними) та українською мовам;

збирати, аналізувати, систематизувати й інтерпретувати факти мови й мовлення й використовувати їх для розв'язання складних задач і проблем у спеціалізованих сферах професійної діяльності та/або навчання;

знання ролі перекладача та принципів професійної діяльності; володіння прийомами забезпечення якості науково-технічного перекладу (вичитування, критичне оцінювання, редагування, зворотний переклад);

володіти науково-технічною термінологією та адекватно застосовувати її у процесі перекладу;

аналізувати та розуміти та ситуацію на ринку перекладацьких послуг з урахуванням вимог до роботи перекладача, професійного стандарту.

3) набуття **результатів навчання** (згідно Дублінських дескрипторів):

- **знання:**

теоретичних засад науково-технічного перекладу з використанням інноваційних методів та відповідних прийомів;

клішованої лексики, що використовується під час науково-технічного перекладу;

мовних засобів, які використовуються у науково-технічному спілкуванні;

лексики й термінології;

особливостей творення і вживання термінів;

основних принципів передачі в перекладі лексико-граматичних та жанрово-стилістичних особливостей матеріалів сфери науки і техніки.

- **уміння/навички:**

конструювати параграфи для організації думок в єдину інтелектуальну структуру;

здійснювати адекватний науково-технічний переклад англійською та українською мовами;

редагувати наукові статті, анотації, технічну документацію та ін. з метою якомога точнішого вираження змісту перекладу;

оцінювати та класифікувати перекладацькі помилки та вносити необхідні корективи у переклад з урахуванням різних типів адекватності;

анотувати та реферувати англомовні науково-технічні тексти рідною та англійською мовами;

стилістично правильно висловлювати власну думку;

користуватися різними видами словників, довідковою літературою;

збагачувати власну мовну компетентність шляхом самоосвіти.

- **комунікація:**

ефективно встановлювати і підтримувати комунікацію в навчальних ситуаціях, типових для майбутньої професійної діяльності, використовуючи відповідні мовленнєві вміння та навички;

здатність застосовувати мовленнєві засоби для вираження власної думки; адекватно формулювати власну думку у межах програмного матеріалу;

здатність оцінювати та передбачати ситуацію мовлення з метою успішного ведення комунікації;

володіння вербальними і невербальними засобами комунікації, уміння контролювати емоції у процесі ділової комунікації;

- **відповідальність і автономія:**

відповідальність за самостійне ведення комунікації;

здатність самостійно оцінювати коректність складеної та перекладеної технічної документації, наукових доробків, науково-технічної літератури з точки зору дотримання норм сучасної англійської літературної мови;

здатність самостійно здійснювати підвищення рівня знань в галузі науково-технічного перекладу;

відповідальність за адекватність визначення важливих мовних та комунікаційних проблем у культурному розмаїтті професійних та академічних ситуацій;

застосовувати міжкультурне розуміння у процесі безпосереднього усного і писемного спілкування в академічному та професійному середовищі.

3. Структура дисципліни

Назви змістових модулів і тем	Кількість годин				
	усього	У тому числі			
		л	п/с	лаб	срс
1	2	3	4	5	6
Змістовий модуль 1: Дискурс науково-технічного спілкування					
Тема 1. Соціофункціональна характеристика науково-технічного дискурсу	8		4		4
Тема 2. Основні положення перекладу науково-технічної літератури	10		4		6
Разом за змістовим модулем 1	**18**		**8**		**10**
Змістовий модуль 2: Лінгвальні маркери дискурсу науково-технічного спілкування					
Тема 3. Лексичні особливості стиля науково-технічної літератури	30		14		16
Тема 4. Стандартизація термінології	28		12		16
Разом за змістовим модулем 2	**58**		**26**		**32**
Змістовий модуль 3: Проблеми перекладу науково-технічних текстів					
Тема 5. Граматичні особливості стиля науково-технічної літератури	38		16		22
Тема 6. Синтаксичні засоби науково-технічних текстів	14		6		8
Тема 7. Переклад наукової статті	12		6		6
Тема 8. Специфіка використання спеціалізованих словників	10		2		8
Разом за змістовим модулем 3	**74**		**30**		**44**
Усього годин	**150**		**64**		**86**

4. Теми семінарських/практичних/лабораторних занять

№ з/п	Вид та тема заняття	Кількість годин
1	Практичне заняття Дискурс науково-технічного спілкування та його особливості	2
2	Практичне заняття Мовне відбиття НТП у текстах науково-технічної комунікації	2
3	Практичне заняття Функціональний стиль науково-технічної літератури	4
4	Практичне заняття Жанрова класифікація науково-технічних документів	2
5	Практичне заняття Головні лексичні проблеми	2
6	Практичне заняття Особливості перекладу поліеквівалентної лексики	2
7	Практичне заняття Неологізми та способи їх творення	2
8	Практичне заняття Критерії якості науково-технічного перекладу	2
9	Практичне заняття Способи перекладу лексичних одиниць	4
10	Практичне заняття Склад науково-технічної термінології	2
11	Практичне заняття Терміни як складові термінологічних систем	2
12	Практичне заняття Основні засоби перекладу термінів	2
13	Практичне заняття Переклад термінів утворених префіксальним способом	2
14	Практичне заняття Переклад термінів з напівпрефіксами	2
15	Практичне заняття Переклад термінів утворених суфіксальним способом	2
16	Практичне заняття Особливості структури речення науково-технічного тексту	2
17	Практичне заняття Англо-українські еквіваленти деяких іменників, прикметників, прислівників, дієслів, типових для наукової та технічної літератури	2
18	Практичне заняття Переклад присудка	2
19	Практичне заняття Часові форми дієслова	2
20	Практичне заняття Узгодження часових форм	2
21	Практичне заняття Переклад підмета. Формальний підмет there, неозначений займенник one	2
22	Практичне заняття Переклад додатка.	2

23	Практичне заняття Переклад означення	
24	Практичне заняття Переклад обставин	2
25	Практичне заняття Синтаксичні засоби науково-технічних текстів	2
26	Практичне заняття Передача значень синтаксичних конструкцій	4
27	Практичне заняття Композиційна структура статті	2
28	Практичне заняття Особливості перекладу заголовків, умовних позначень, метричної системи, скорочень, кліше та мовних еквівалентів технічної документації	4
29	Практичне заняття Специфіка використання спеціалізованих словників	2
Всього:		**64**

5. Розподіл балів, які отримують студенти

Вид контролю: залік

Відповідно до системи оцінювання знань студентів ДонНУЕТ, рівень сформованості компетентностей студента оцінюються впродовж семестру (100 балів).

Оцінювання протягом семестру
(заочна форма навчання)

№ теми практичного заняття	Вид роботи/бали					
	Тестові завдання	Ситуаційні завдання	Виконання практичних завдань теми	Індиві-дуальне завдання	ПМК	Сума балів
Змістовий модуль 1						
Тема 1			2			2
Тема 2			2			2
Тема 3			2			2
Тема 3.1			2			2
Разом змістовий модуль 1			8			8
Змістовий модуль 2						
Тема 4			2			2
Тема 5			2			2
Тема 6			2			2
Тема 7			2	6		8
Тема 8			2			2
Тема 9			2			2
Тем.1. 9			2			2
Тема 10			2			2
Тема 11			2			2
Тема 12			2			2
Тема 13			2			2
Тема 14			2			2

Тема 15			2			2
Разом змістовий модуль 2			26	6	10	42
Змістовий модуль 3						
Тема 16			2			2
Тема 17			2			2
Тема 18			2			2
Тема 19			2	6		8
Тема 20			2			2
Тема 21			2			2
Тема 22			2			2
Тема 23			2			2
Тема 24			2			2
Тема 25			2			2
Тема 26			2			2
Тема 26.1			2			2
Тема 27			2			2
Тема 28			2	2		4
Тема 28.1			2			2
Тема 29			2			2
Разом змістовий модуль 3			32	8	10	50
Разом						**100**

Оцінювання студентів протягом семестру (заочна форма навчання)

Поточне тестування та самостійна робота					Сума в балах
Змістовий модуль 1	Змістовий модуль 2	Індивідуальне завдання 1	Змістовий модуль 3	Індивідуальне завдання 2	100
5	20	25	20	30	

Загальне оцінювання результатів вивчення навчальної дисципліни

Для виставлення підсумкової оцінки визначається сума балів, отриманих за результатами складання змістових модулів. Оцінювання здійснюється за допомогою шкали оцінювання загальних результатів вивчення дисципліни (модулю).

Оцінка		
100-бальна шкала	**Шкала ECTS**	**Національна шкала**
90-100	A	5, «відмінно»
80-89	B	4, «добре»
75-79	C	
70-74	D	3, «задовільно»
60-69	E	
35-59	FX	2, «незадовільно»
0-34	F	

ЧАСТИНА 2.
ЗМІСТ ПРАКТИЧНИХ ЗАНЯТЬ

PART 2.
PRACTICAL TRAINING SUBJECT MATTER

UNIT 1. SOCIO-FUNCTIONAL CHARACTERISTICS OF SCIENTIFIC AND TECHNICAL DISCOURSE

Task 1.1. Compare the original text and its translation.
a) English – Ukrainian translation:

Biofuels are back

Today, along with increasing demand for crude oil, which is trading near record highs, and growing concern about the environmental impact of burning fossil fuels for energy, there is a comeback of interest in fuels derived from plants. The technology behind these biofuels is not new. Bio-diesel has been around ever since German inventor Rudolph Diesel designed the diesel engine in the early 1900s.

Biodiesel production is even simpler. Oil from vegetable or animal sources is mixed with sodium methoxide, obtained by combining methanol and sodium hydroxide. This mixture is then heated and stirred to promote a chemical reaction called transesterification, which produces glycerine and methyl esters, or biodiesel.

Biofuels are clean-burning, renewable, reduce dependence on imported crude oil and create jobs. There is little waste, as glycerine is a marketable by-product, used in the manufacture of soap and cosmetic products (From Bussiness day).

Translation:

Біопаливо повертається

Сьогодні, разом із зростаючим попитом на нафту, яка продається майже в рекордній кількості, і зростаючої тривогою щодо впливу відходів добувного палива на оточуюче середовище, знову з’являється інтерес до видів палива, що отримується з рослин. Технологія отримання цих видів біопалива не нова. Про біодизель було відомо ще з того часу, як німецький винахідник Рудольф Дизель створив дизельний двигун на початку 1900-х років.

Виробництво біопалива набагато простіше. Масло і жири, одержані з рослин або тварин, змішують з метилатом натрію, який утворюється шляхом з’єднання метанолу і гидроксида натрію. Потім цю суміш нагрівають і розмішують для прискорення хімічної реакції під назвою трансестерифікація, в результаті якої утворюється гліцерин і метиловий ефір або біопаливо. Біопаливо згоряє повністю, знижує залежність від сирої нафти, що імпортується, і створює робочі місця. Воно практично не має відходів, тому що гліцерин, що є його побічним продуктом, використовується у виробництві мила і косметичних товарів.

Computer news

Microsoft has registered a Web site for something called "The Origami Project. But what we’re hearing now is that Origami might be little more than a new code name for an ultra-portable device that Microsoft demonstrated last year at its Windows Hardware Engineering Conference.

The original "Haiku" device was described as an ultra-portable miniTablet when the first prototypes made their public debut. The systems, as described Microsoft Chairman Bill Gates, would weigh about a pound, feature a battery that could hold a

charge for a full day, and integrate a camera, a phone anda music device in a single form factor (From Microsoft-Watch.com).

Translation:

Комп'ютерні новини

Компания «Майкрософт» зареєструвала веб-сайт для продукту під назвою «Проект Origami». Як стало відомо, origami – це, можливо, дещо більше, ніж проста кодова назва суперпортативного комп'ютера, яку компанія «Майкрософт» демонструвала минулого року на своїй конференції «Windows Hardware Engineering» («Розробка апаратури для операційної системи»).

Оригінальний пристрій «Хайку» був описаний як суперпортативний мініпланшет, коли його перші прототипи були показані користувачам. Цей пристрій, як сказав керівник компанії «Майкрософт» Білл Гейтс, важитиме приблизно фунт, притому, що батарея залишатиметься зарядженою весь день, і він включатиме фотоапарат, телефон і музичний пристрій.

б) Ukrainian – English translation:

Атом = 99 % пустки і 1 % світла

Відомо, що атом складає основу всіх макросистем всесвіту; він складає основу будь-якої матерії і на відміну від матерії не є щільним, оскільки між ядром атома і його електронами існує пустка. Швидкість одного маленького атома складає тисячі кілометрів за секунду, завдяки чому атом виглядає як щось тверде. Щоб розібратися в цьому, уявімо пропелер літака, що летить. Коли він в русі, ми бачимо тільки твердий, щільний круг, хоча насправді це лопаті, що лише обертаються.

Дослідники в галузі квантової фізики відкрили, що природа атома абсолютно інша, ніж та, що ми уявляли. Виявляється, електрони та інші частинки атома, розташовані незалежно один від одного, насправді тісно взаємозв'язані між собою і складають певну динамічну єдність.

Версія Ньютона про тверду матерію ще раз доводить правильність доводів. Якщо подивитися на ці речі за допомогою електронного мікроскопа, ми побачимо 99 % пустки і 1 % світла. Якщо в темній кімнаті обертати промінь світла з великою швидкістю, ми побачимо зовсім не промінь, що не обертається, а круг (За матеріалами журналу «Наука»).

Translation:

Atom = 99 % of vacuum and 1 % of light

As we know, atom forms basis of all macrosystems of the universe; it forms basis of any substance and it is not compact in contrast to substance, as between atomic nucleus and its electrons there is space.

Speed of a small atom is equal to one thousand kilometers per second, and owing to this, atom looks like something solid. In order to understand it better, let's imagine a propeller of a flying airplane. When it is in motion, we can only see a solid, compact circle, though in reality it is just a rotating propeller.

Scientific researchers in the sphere of quantum physics discovered that nature of atom is quite different from the one that we imagine. It turns out that electrons and other particles of atom, which are situated independently from each other, in reality are closely interconnected, and they form some dynamic unity.

Newton's version on solid substance proves once more correctness of arguments. If we look at these things with the help of electronic microscope, we can see 99 % of vacuum and 1 % of light. If to rotate a ray of light in a dark room with high speed, we will not be able to see a rotating ray at all, but only a circle.

Task 1.2. Translate the text into Ukrainian.

A giant factory that can't be seen

In every part of our body there reigns a tiny yet complex life. An examination under the microscope into the depths of any human organ brings us face to face with an astounding miracle: millions of tiny living things that have come together to make up that organ are engaged in arduous activity.

These tiny beings are cells, the basic units of life. Not only man but also all other living things are composed of these microscopic living beings. There are about 100 trillion cells in the human body. Some of these cells are so tiny that even 1 million of them together hardly cover a space as large as the pointed end of a pin. But thanks to the fact that these cells are very small, our bodies are not of gigantic size. Despite this, however, the cell is by far the most complex structure mankind has ever encountered.

When cells are combined with each other, they form cell groups that acquire such characteristics as flexibility, movement, reproduction, and nerve transmission. For example, the muscle cells in your legs are like a rope woven so that you can walk and run. Thanks to the structure they possess, your arm and leg muscles do not tear due to excessive stretching while you are playing with a ball. In shape, your blood cells are globular, their task being to transport oxygen, which is required by your body, by means of blood vessels. Thanks to their shape, they can easily flow through the blood vessels together with the oxygen they carry. Skin cells, on the other hand, are clamped together and closely arranged in a line. So your skin is unreceptive to microbes and water. We know that all such body units as cells, tissues, and organs have a perfect integrated system. And yet it is still unclear how they combine and carry out the functions necessary to make eyes, the brain, bones, muscles, and so on, all of which are composed mainly of carbon, hydrogen, oxygen, nitrogen, and phosphate.

Task 1.3. Translate the text into English, comment used translation transformations.

Оздоровча музика

Багато живих істот володіють слуховою системою, щоб відчувати, обробляти і впізнавати звукові сигнали. Чутливість людини до ритму, мелодії, виразним звукам та їх функціям є предметом різних досліджень. Дослідження, яке проводиться в біомузикології, аналізує вплив музики на живі організми. Сьогодні

дія музики на людський розвиток, навчання і психічне здоров’я, починаючи з передпологової стадії, стала предметом серйозного вивчення.

Музика є естетичним способом спілкування. Люди, як і природа, можуть творити музику. Дуже ефективний інструмент спілкування – музика – використовується для розваги і розслаблення. Вона також є основою величезного ринку праці і торгового сектора.

Звуки, які видають живі істоти або неживі предмети, мають ритм і гармонію. Люди, які слухають цей звук і відчувають його ритм і гармонію, називають його «музикою природи». Якщо вони нічого не відчувають, то називають його «шумом». Такі звуки, як вітерець, проточна вода або щебет птахів, є ознаками живого і активного всесвіту, і ці звуки природи пропонують розслабитися і злитися з природою.

UNIT 2. THE MAIN ASPECTS OF TRANSLATING SCIENTIFIC AND TECHNICAL LITERATURE

Task 2.1

a) Read the text 1 and define the main idea of the text. Explain how it is developed in the further sentences of the paragraph;

b) Define which structureal groups the sentences of the paragraph refer to: TS (Topic sentences), E (Example Sentences), Tr (Transition sentences), R (Restatemant Sentences). Make the structural formula of the paragraph;

c) Translate the text 1, paying attentention to the translation of terms, connected with the study process at university. On the strength of the given text 1 make your assumptions about the next probable paragraph;

d) Find the appropriate title to the text 1.

TEXT 1

More then 36% of the freshmen entering large American universities are dismissed during or at the end of the first year. Studies indicate that this rate of failure is due to a variety of causes, some of which are beyond the control of the student. Among these are inadequate academic and personal councelling services, inferior quality of instruction in very large freshmen classes, and the computerized anonumity of most administrative procedures. But many of the causes of early student failure can be traced to non-adaptive behavior on the part of the student himself.

Task 2.2

a) Read the text 2 about universities of Great Britain and the United States. Define the main idea of the text judging from the context of the paragraph, taking into consideration that TS (Topic sentence) is omitted. Explain how the main idea is developed in the further sentences of the paragraph;

b) Choose the best TS among the given below:

1. **The organization, aims and the operation of universities in the U.S.are different.**
2. **British universities are smaller then their American counterparts.**
3. **American and British universities have similar goals in their persuit of knowledge, but are different in organization and operation.**

c) Define which structureal groups the sentences of the paragraph refer to: TS (Topic sentences), E (Example Sentences), Tr (Transition sentences), R (Restatemant Sentences). Make the structural formula of the paragraph;

d) Translate the text 1, paying attentention to the translation of terms, connected with the foreing higher educational establishments. On the strength of the given text 2 make your assumptions about the next probable paragraph;

e) Find the appropriate title to the text 2.

TEXT 2

Universities and colleges of Great Britain, mostly because of their selective intake, are usually small and traditional. American seats of higher learning, which combine a number of different colleges and professional schools, are usually large and innovative, sometimes with 25,000 to 35,000 students on one campus. Teacher training colleges and polytechnics are alternatives to universities for some English students. In contrast, virtually all schools of education, engineering and business studies are intergral part of universities in the USA. English universities receive about 70% of their financial support through Parliamentary grants. Similary, in the US, public institutions receive about 75% of their funds from local, state and federal sources, but private colleges and universities receive little or no governmental support. In England, personal financial aid is provded by the government to over 80% of the students, according to the parents' income. In the US students' aid is administered by the university ot the sponsoring agency and is provided by private organizations and the state or federal governments. Obviously, British and American universities have similar educational aims, but different sources of financial support.

UNIT 3. LEXICAL STYLE PECULIARITIES OF SCIENTIFIC AND TECHNICAL TEXTS

Task 3.1. Translate the sentences, identify which words (terms) that need to be translated based on the choice of alternative matches:

Section A. 1. Conflict may, according to some theorists, have a positive social function. 2. He was among the first to exploit front-end geometry for steering stability. 3. One such refinement is a damping device that shortens the time required for the swinging of the weighing arm to cease. 4. Stems of grasses have two parts: nodes and intemodes; the node is a joint in the stem at the place where leaves are attached. 5. Acetylcholine acts like a "key"- it is released from one cell and moves to the next cell, which it activates by fitting into a "lock," called a receptor. 6. Deuterium was first identified (1931) by Harold Urey, F.G. Brickwedee, and G.M. Murphy in the spectrum of the residue from the evaporation of liquid hydrogen. 7. In CAD, engineers use specialized computer software to create models that represent the geometry and other characteristics of objects.

Section B. 8. Because of the geometry of the openings in the chamber walls and of the ducts connected to these openings, the pumping pressure of the chambers draws water in one direction through the sponge. 9. In the fields of geomorphology and hydrology, aerial photographs find application in watershed studies, flood control, and evaluation of water pollution and shoreline changes. 10. Rotation of the steering wheel is translated, through gearing and a network of rods and joints (the steering linkage), into right or left movement of the car's front wheels. 11. Many analog devices have been replaced by digital devices, mainly because digital instruments can better deal with the problem of unwanted information, or noise. 12. Simple interest means that the interest payment for the year is the principal amount multiplied by the interest rate; for example, the interest on $ 1,000 is $60 if the interest rate is 6%.

Section C. 13. Policy is guided by the recognition that crime is often socially produced, that criminals suffer from "problems in living," and that only truly dangerous offenders should be incarcerated. 14. Trace amounts of various metals in stream sediments are used in reconnaissance exploration just as previous prospectors used the gold pan to trace placer gold to the mother lode. 15. If a template matches some area of the sample image, the image might contain the corresponding object; unfortunately, the match is usually imperfect due to image noise, object variation, object rotation, changes in lighting, and other factors. 16. The Egyptian royal cubit was divided into units of seven palms, the palm being the width of four fingers; in turn, each palm could be subdivided into four digits, the breadth of the middle finger.

Section D. 17. To encipher a message or datum requires knowing n plus a number e, the latter also known to everyone. Although everyone can encipher a message or datum using the known numbers, decipherment can be accomplished only by someone who knows n and a private number, d. 18. In June 1970, North American Rockwell received the contract for the airframe, with General Electric to supply the engines. Designated B-1 (later, B-1 A), the original supersonic, variable -geometry,

strategic bomber prototype emerged as a monoplane with swing wings of 41.67m(136ft8 1/2 in) extended span and 15 degrees sweepback, and a spread of 23.84 m (78 ft 2 1/2 in) in the fully swept position (67.5 degrees). 19. The personality' structure and life history of the psychopath are quite different from those of the person whose antisocial or criminal behavior is related to some underlying emotional disturbance, and from those of a person whose antisocial behavior results from living in a criminal subculture or in an environment in which such behavior is expected or rewarded.

Task 3.2. Translate the sentences, identifying in which cases the transcoding technique should be used when translating terms.

Section A. 1. In astronomy, for example, bolometers measure the energy of starlight. 2. Typical condensation polymers are polyamides, polyesters, and certain polyurethanes. 3. Creosote is an excellent antiseptic and was formerly used in the treatment of chest infections. 4. The rotor of a helicopter usually has two or more blades radiating symmetrically from a central hub. 5. Although the proton is not an elementary particle (it contains three constituent quarks), its mass is of special importance. 6. By using so-called superheaters, modem boilers can achieve almost 90 per cent fuel efficiency. 7. The World-Wide Web is an Internet-based application that exploits this capability to provide a global information service.

Section B. 8. Many personal computers and workstations now have software packages that mimic the operation of a fax machine. 9. A blasting cap or exploder is a small charge of a detonator designed to be embedded in dynamite and ignited either by a burning fuse or a spark. 10. An accelerator card allows a user to upgrade a system to a faster microprocessor without having to replace the cards, drives, keyboard, or case. 11. Although composite materials have certain advantages over conventional materials, composites also have some disadvantages. 12. Contact between two societies in which each experiences cultural change to an approximately equal degree is called acculturation. 13. Desegregation is the abolition of social segregation according to ethnic background.

Section C. 14. Barrister is a lawyer permitted to plead at the Bar, usually at the request of a solicitor. 15. The international unit of light intensity, the candela, was defined as 1/60 of the light radiated from a square centimetre of a blackbody, a perfect radiator, held at the temperature of freezing platinum. 16. Because modem interferometers can measure very tiny angles, they are further used—again, on such nearby giant stars as Betelgeuse-to gain images of brightness variations on the surfaces of such stars. 17. Cellophane was invented about 1910 by the Swiss chemist Jacques Brandenberger, who in 1912 invented the first machines for large-scale production and established a factory near Paris. 18. Monorails have also been installed in Tokyo, between the airport and the central area, a distance of 13.2 km (8.2 mi), and in Dallas, Texas, between the airport car park and a passenger terminal.

Section D. 19. Aerosol Dispenser container and valve are designed to dispense a wide variety of substances in the form of fine sprays, foams, or liquid streams. The

product to be dispensed, such as paint, cosmetics, or food, is sealed in the container with a propellant gas under pressure. 19. Radioaltimeters, radar devices modified to measure vertical distance only, beam a pulse of electromagnetic radiation downwards from the aircraft. 21. Somewhat similar to scrapers are graders, which are self-propelled, wheeled machines with a long, inclined, vertically adjustable steel blade. Graders are primarily finishing equipment; they level earth already moved into position by bulldozers and scrapers. 22. When exhaust gases pass through the catalytic converter, these metals act as catalysts, encouraging chemical reactions that change pollutants, such as carbon monoxide and certain hydrocarbons, into less harmful carbon dioxide and water.

Section E. 23. Large cultivators for field crops are usually tractor drawn. Small cultivators with wheels, usually called wheel hoes, can be pushed manually by the operator and used in vegetable gardens. 24. Methods of starting large engines include the inertia starter, which consists of a flywheel that is rotated by hand or by means of an electric motor until its kinetic energy is sufficient to turn the crankshaft, and the explosive starter, which employs the explosion of a blank cartridge to drive a turbine wheel that is coupled to the engine. 25. The marine gyropilot has no gyroscope, but picks up electrically any divergence from the set course reference supplied by the gyrocompass; these signals are amplified and applied to the steering engine of the ship to cause the rudder to return the ship to its proper course.

Section F. 26. The systematic process of product design has to resolve the often conflicting demands that arise in the development of products. These might include considerations of manufacturing, marketing, aesthetic appeal, protection of the environment, ergonomics, financial cost, ease of maintenance, and safety. 27. Deflation involves a sustained decline in the aggregate level of prices, such as occurred during the Great Depression of the 1930s; it is usually associated with a prolonged erosion of economic activity and high unemployment. 28. Monetarism is commonly contrasted with Keynesianism, which roughly corresponds to the view that changes in the money supply have little, if any, short-term impact on the economy, that the economy will not automatically move towards full employment, and that fiscal policy can be effective in helping attain full employment.

Section G. 29. Oligopoly, a market dominated by a few producers or suppliers. It falls somewhere between a situation where there is what is known as perfect competition and one in which there is a monopoly, domination of the market by one producer or supplier. 30. The initial influence of behaviourism on psychology was to minimize the introspective study of the mental processes, emotions, and feelings and to substitute the study of the objective behaviour of individuals in relation to their environment by means of experimental methods. 31. Pyromania can often be treated by psychotherapy. The pyromaniac is legally considered an arsonist. 32. Passive or negative euthanasia involves not doing something to prevent death - that is, allowing someone to die; active or positive euthanasia involves taking deliberate action to cause a death.

Section H. 33. Exogamy serves two principal functions: the prevention of the ill effects of inbreeding and the elimination, from groups such as clans that function

cooperatively, of the tension caused by sexual rivalries. 34. A modem converts the digital signals of the sending computer to analogue signals that can be transmitted through telephone lines. 35. In the world of computers, multimedia is a subset of hypermedia, which combines the elements of multimedia with hypertext, which links the information. 36. Defamation, the act of damaging the reputation of another by means of false and malicious communications that expose that person to contempt, ridicule, hatred, or social ostracism. 37. Like Lutherans and Calvinists, the Anabaptists believed in the paramount importance of personal faith in God, as opposed to ritualism, and to the right of independent personal judgment.

Section I. 38. The auctioneer acts as the agent of the seller and is paid a commission based on the sale price. Some auctioneers, Sotheby's and Christies, for example, also charge the buyer a commission on the sale price. 39. Boycott initiators often attempt to enlist the support of friendly or neutral sections of the population, as, for example, when democratic groups in various countries refused to purchase goods from National Socialist Germany before World War II.

Task 3.3. Translate the sentences, identifying in which cases the descriptive translation technique should be used when translating terms.

Section A. 1. A star that is in balance and burning hydrogen in its core is called a main sequence star. 2. A flowchart is a pictorial description of a procedure to be followed in solving a given problem. 3. The biota (plants and animals) of each kind of biome have similar characteristics worldwide; biomes comprise smaller units called habitats. 4. The associated ocean bottom is generally flat in the Atlantic and hilly in the Pacific and is composed mainly of pelagic or partially pelagic muds - that is, open-ocean sediments as contrasted to those deposited near continents by rivers. 5. In 1989 the United States began constructing a proton collider, the Superconducting Super Collider (SSC), which was to yield collision energies of 40 TeV. 6. Advection is the process by which one or more properties or components of the atmosphere - such as temperature, moisture, or pollutants - are affected by horizontal (and sometimes vertical) air movements.

Section B. 7. Aperture synthesis is a method in radio astronomy that utilizes several telescopes simultaneously to create images of cosmic radio sources, which results in much better resolution than can be achieved by the individual telescopes. 8. An intermetallic compound is made up of two or more elements that together produce a new substance having its own composition, crystal structure, and properties. 9. Such programs typically include collections of stored images called "clip art," which users can electronically "clip out," "paste into" the working file, and then manipulate. 10. Online, interactive services are information and transactional services that are delivered to individual users, through a personal computer or other electronic devices, using a two-way telecommunications system such as a telephone or cable television.

Section C. 11. The combined status and income or occupational divisions in capitalist industrial societies are sufficiently alike to permit sociologists to identify four main classes: an upper class of owners, managers, and top public officials; a middle

class of nonmanual white-collar workers and owners of small businesses; a manual working class; and a lower class, or underclass, of the irregularly employed and the rural poor. 12. Because futurists recognize the unavoidable uncertainty inherent in forecasting, much of their work focuses on "what-if" examinations of alternatives rather than precise prediction. 13. Affor- dances are perceivable characteristics of objects, people, and layouts that support some action- for example, the convenient mountability of a stairway.

Section D. 14. Affirmative action is a formal effort to provide increased employment opportunities for women and ethnic minorities, to overcome past patterns of discrimination: under the Equal Employment Opportunity Act of 1972 most federal contractors, all state governments and institutions (including universities), and most local governments were required to initiate plans to increase the proportions of their female and minority employees until they matched the proportions existing in the available labor market. 15. Already there are "debit" cards, with which customers may make purchases with money deducted immediately and electronically from their checking accounts; "dumb" cards, which allow holders to use a certain amount of prepaid telephone time; and "smart" cards. 16. Some anthropologists use the term enculturation to refer to the process of socialization. 17. Adoptionism, or adop- tianism, was a theological doctrine propounded in the 8th century by a Spanish bishop, Elipandus of Toledo: concerned to distinguish between the divine and human natures of Christ, Elipandus held that in his divinity Christ was the son of God by nature, but in his humanity by adoption only.

Task 3.4. Translate the sentences, identifying words of broad semantics and adequate way of their translation (including deletion):

Section A. 1. There are two points to be made here. 2. Let me summarize the main points that have been made in this chapter. 3. It is at this point that we turn to more technical questions. 4. Let us now turn to the kind of results that might come from answering point 2.6. 5. But we are not interested in it as isolated pieces of writing but as a representative instance of how scientific descriptions are made. 6. Note that at this stage we are not concerned with whether or not these findings are significant for our understanding of the problem. 7. The point then is that there is not, nor can be without misrepresentation, one definitive interpretation of the data. 8. Clearly, a position for which there are no arguments, which has no satisfactory criticisms of its major alternative and which, finally, is internally inconsistent, must be rejected in favor of that alternative, given, as is the case here, that there are no other serious alternatives.

Section B. 9. In this context cannibalism could be a formal affair, but the situation sometimes exploded into uncontrolled action, including the assault of a corpse and fights over the best portions of meat. 10. The history of the relation between philosophy and theology is thus a long and mixed affair, running the gamut from clarifying religion and providing a justification for it to tearing apart its intellectual underpinnings and trying to see what is left that a 20th-century scientifically oriented person can believe or take seriously. 11. Until recently, television in Europe was a

government monopoly, and although there were a few spectacularly successful stations-notably Britain's two BBC channels-by and large, European TV was a fairly dull affair, enlivened now and then by made-for-TV movies by such directors as Federico Fellini and Ingmar Bergman or by American imports.

Section C. 12. In fact, software and the disk that contains it are often thought of as being the same thing. 13. A reason for such precaution is that it is easy to confuse "one thing causes another" with "one thing follows another." 14. The most remarkable thing that particles do is to change into one another, either by the decay of a single particle into several others or in a collision between two particles from which several new ones may emerge. 15. No such thing as a perpetual motion machine actually could exist. 16. Darwin's geological observations and theories had one thing in common - the idea that things in nature change with time. 17. The New Deal is the term used to refer to U.S. president Franklin D. Roosevelt's program (1933-39) of relief, recovery, and reform that aimed at solving the economic problems created by the Depression of the 1930s.

Section D. 18. The Fair Deal was the name given to the domestic programs of President Harry S. Truman. First used in 1949, the term generally refers to Truman's entire presidency (1945-53). 19. A great deal of information about the ancient Celts has been gathered by archaeologists from the physical remains of their settlements, cult sites, and burial places all across Europe. 20. The concern with these materials is that the emitted radiation may interact with the human body and cause damage to cells. 21. The early history of spaceflight was characterized by deep concern on the part of many scientists that humans would not be able to withstand the rigors of spaceflight, especially during launch and reentry, and might not be able to function usefully in space. 22. This concern with abstract form was shared by the leading European photographers of the 1920s, who bore no allegiance to the creed of straight photography.

Section E. 23. Both Aswan dams have been the focus of worldwide archaeological concern. 24. In simplest terms, the concern of science is "why," and of technology, "how." 25. Other evidence has given astronomers a good idea of the origin of the universe – the concern of cosmology. 26. Unlike most geologic landforms, meteorite craters are created almost instantaneously; they can therefore be experimentally scale-modeled without concern for the time factor. 27. On the other hand, some theorists have a scientific dislike of the possibility that black holes (and singularities in particular) exist in the first place, because they project that such objects ultimately would constitute a direct challenge to the known laws of physics. 28. The improvement of the safety of existing chemical products, for example, pesticides, is another challenge. 29. The stereocontrolled synthesis of a complex molecule - for example, the antibiotic monensin, which has 17 asymmetric centers and 131,072 possible stereoisomers - represents a tremendous intellectual challenge.

Section F. 30. Combating AIDS is a major challenge to biomedical scientists and health-care providers. 31. Egoism, however, is not just another version of normative theory; it is, rather, a challenge to ethical theory itself. The challenge of egoism is that it raises the questions, Why should I be moral? What's in it for me?, which rest on the

idea that if there is no advantage in being moral, the agent can have no reason to be. 32. Historically associated with the Netherlands, Belgium became a separate entity in the 17th century but did not become independent until 1830. 33. Although the Nguni peoples share a common language and culture, with regional variations, they are not a political entity. 34. The neutron may be regarded as one of the basic constituents of the atom, even though it (like all hadrons) is a complex entity. 35. In nuclear physics, a quark is a hypothetical entity representing a basic constituent of matter - even more fundamental than the proton and neutron, which were once thought to be "elementary" particles.

Section G. 36. The employees of the corporation are not held personally responsible for the acts of the corporation as a legal entity, although, under the law, they may be held responsible for acts committed as individuals. 37. In addition to the traditional judicial system, a separate and somewhat competing entity, the court of chancery or equity, also developed. 38. A heat engine is any device that withdraws heat from a heat source, converts some of this heat into useful work, and transfers the remainder of the heat to a cooler reservoir. 39. The average flux of solar energy incident of the top of the atmosphere per unit area perpendicular to the Sun's rays is about 1,380 watts/sq. m. 40. Conditional instability is a widespread occurrence and accounts for the predominance of convective (cumulus) clouds in the atmosphere.

Section H. 41. The goal is to be able to forecast the location, strength, and time of occurrence of a particular earthquake. 42. There is no more compelling question in cosmology. Not only has Earth long since been displaced from its central position, the stuff of which it is made - as are we humans and all other life-forms - appears to be different from the stuff that comprises most of the universe. 43. One of the most impressive new talents of the 1950s was Robert Frank. Learning from Walker Evans, he forged powerful symbols from the ordinary stuff of American life. 44. To others, the forces that determine revolutionary events are economic and may even lie outside national boundaries that is, transnational structures and institutions like multinational corporations and are therefore the real stuff of change. 45. His self-aggrandizement, strong- arm enforcement, and a certain oleaginous charm were the stuff of melodrama, and Robert Rossen brought it all to the screen as writer, producer, and director.

Section I. 46. For playback, the record spins on a turntable while a lightweight "stylus" traces the pattern of wiggles in the groove. 47. There are generally three stages in optical pattern recognition: image processing, pattern classification, and scene analysis. 48. The record of this interference pattern on photographic film is the hologram. 49. The question is now where the tendency comes from. 50. But, however far chance shapes organisms, it cannot account for adaptations, for the design features of living things. 51. Anatomy is a branch of natural science dealing with the structural organization of living things. 52. The arbitration will generally be phrased in the contract as dealing with matters arising under the contract, or out of the contract; the latter phrase allows the arbitration to deal with things that are not actually in the contract, but which occurred in the circumstances of carrying it out.

Section J. 53. Interesting constellation maps and useful calendars were developed by several ancient peoples, notably the Egyptians, the Mayans, and the

Chinese, but the Babylonians accomplished even greater things. 54. For example, islands typically have fewer species overall than equivalent sized continental areas, but also usually have a higher percentage of species found nowhere else. In other words, other things being equal, they have lower species richness but higher species endemism. 55. Huxley insisted that the conventional segregation of zoology and botany was intellectually meaningless and that all living things should be studied in an integrated way. 56. Bionics is the scientific study of living things as functional models for technical devices useful to humans, especially when applied to systems engineering.

Section K. 57. To complicate matters still further, cartographers in different countries not only produce maps to different specifications - they also call them different things. 58. Other branches of inorganic chemistry include solid- state chemistry, which is concerned with, among other things, the chemistry o' semiconductors; ceramic chemistry; high-temperature and high-pressuie chemistry; geochemistry; and the chemistry of the transuranic elements, tne elements of the actinide series, and the rare earth elements. 59. Evidence for the snowball theory rests on various data. For one thing, of the observed gases and meteoric particles that are ejected to form the coma and tails of comets, most of the gases are fragmentary molecules, or radicals, of the most common elements in space.

Section L. 60. In a recession or depression, the proper thing to do was either to enlarge private investment or create public substitutes for the shortfalls in private investment. 61. Human-factors engineering seeks to establish criteria for the efficient, human-centred design of, among other things, the large, complicated control panels that monitor and govern nuclear reactor operations. 62. Ergonomists are scientists who have specialized in the study of the interface between people and the things they come into contact with - particularly artificial things. 63. How are the chromosomes and their genes copied from cell to cell, and how do they direct the structure and behaviour of living things? 64. Globalization, or the internationalization of production, technology, enterprise, and exchange, means different things to different people.

Section M. 65. The main reason for this, it would be argued, would be that an increase in the money supply, other things being equal, would eventually lead to inflation. 66. All measurement is based on a comparison. In general, the thing to be measured is compared with something that has already been measured against a known reference. 67. It is surprising and profound that the inertial property and the gravitational property are determined by the same thing. 68. Supporters of Leibniz asserted that he had communicated the differential method to Newton, although Leibniz had claimed no such thing. 69. Among other things, his treatment of types of regimes in his ***Politics*** presaged countless efforts to classify forms of government and has remained a major influence on the discipline.

Section N. 70. Though open to the criticism of over-simplification, this does usefully demonstrate that whatever the levels of consumption, involving whatever technology, population will multiply the use of resources and of space as well as the output of waste, other things being equal. 71. Since 1992, states in the United States have been allowed to privatize their infrastructure, and faced with budget problems many may be keen to sell off such things as airports and toll roads. 72. For the purpose

of studying the mathematical properties of sets, it does not matter whether their members are concrete or abstract, real or fictitious, or whether these different types of things are mixed together. 73. The raw materials of statistics are sets of numbers obtained from counting or measuring things. 74. Temperature plays an important part in determining the conditions in which living things can survive.

Section O. 75. All living things need continuing supplies of water to survive. 76. Ultraviolet radiation can be harmful to living things, particularly when the wavelengths are small. 77. In other words, a fast-moving electron striking the target can do two things: it can excite X-rays of any energy up to its own, or it can excite X-rays of particular energies, which are dependent on the nature of the target atom. 78. it was not until 1839 that two Germans, Matthias Schleiden and Theodor Schwann, proved that the cell is the common structural unit of living things. 79. Until recently, television in Europe was a government monopoly, and although there were a few spectacularly successful stations—notably Britain's two BBC channels - by and large, European TV was a fairly dull affair.

Section P. 80. Rather than trying to maintain dual inventories for domestic and foreign markets, a number of U.S. corporations have chosen to go metric. (For example, motor vehicles, farm machinery, and computer equipment are manufactured to metric specifications.) As business goes, so probably will go the nation. 81. Each piece of structural steel is fabricated in a factory, where it is marked to show exactly where it will go in the finished frame. 82. When the same invention is made independently by different persons, the patent is awarded to the person who can prove he or she made the invention first. In other countries, it would go to the person who was first to apply for the patent. 83. The fundamental principle of brain organization is that the organization is hierarchical-that is, the same behavior is represented at several levels in the nervous system and in parallel, so that different functions can occur at the same time. 84. This technology is the basis of all phonograph records. 85. The major concern of thermodynamics is the state functions and the properties of the macroscopic system.

Task 3.5. Translate the sentence, identifying the words in the translation of which it is advisable to apply the transformation of generalization:

Section A. 1. Industrialization usually goes hand in hand with agrarian reform, if for no other reason than that an agrarian revolution allows a relatively small agrarian labor force to feed a larger manufacturing work force. 2. Other industries such as chemicals and mining and the engineering professions also developed rapidly. 3. Technology is a major cultural determinant, no less important in shaping human lives than philosophy, religion, social organization, or political systems. In the broadest sense, these forces are also aspects of technology. 4. Under these circumstances private inventors are likely to play a progressively smaller role in bringing about innovation, although they are not likely to disappear altogether.

Section B. 5. Any major technological development is attended by proponents and opponents with conflicting interests, such as business, labor, the administrative and

technical elite, politicians, environmentalists, economists, and public advocates. 6. The promise of technology assessment is that an impartial body such as the OTA can lay aside all vested interests and provide decision makers with rational advice as to which developments are truly in the public interest. 7. Even more effective is transfer of the technology itself, by the provision of blueprints, models, designs, patents, and other know-how and by the establishment of workshops, factories, training programs, and agricultural and engineering colleges.

Section C. 8. For example, many of the biggest pharmaceutical producers in the United States are involved in the search for genetically improved plants and animals and for genetically engineered vaccines. 9. Pest populations are typically reduced immediately by the application of an effective pesticide. 10. A neutron in a nuclear reactor can meet one of several fates: it can be absorbed in the fuel, producing fission and more neutrons; it can be absorbed by non- fissionable materials in the reactor core and thus lost; it can be absorbed by a fertile material.

UNIT 4. STANDARDIZATION OF TERMINOLOGY

Task 4.1. Translate the sentences, determining the appropriate way to translate terms with the prefix *after- :*

1. Many small earthquakes, called aftershocks, occur in the hours and days following a large earthquake. These aftershocks result from the rock near the fault adjusting to accommodate the new stress levels.
2. About 62% of U.S. aid during this period was designed to facilitate the economic recovery of war- torn industrialized countries, to alleviate the immediate aftereffects of natural disasters, or to stimulate economic growth in less-developed countries.
3. The object of Epicureanism was pleasure, but pleasure of an austere kind involving primarily freedom from fear of the gods and of an afterlife.
4. Contemporary torpedoes consist of four major components, which are, from front to rear, a warhead, a fuel section, an afterbody, and a tail section.
5. In his work he creates illusions of movement and afterimages through the use of alternating patterns and oscillating vibrations of color.
6. The Boys & Girls Clubs of America (known as Boys Clubs of America until 1990) is a national (including Puerto Rico and the U.S. Virgin Islands) federation of clubs that provide afterschool sports, recreations, vocational training, and job-finding skills to boys and girls primarily in urban areas.
7. They have an anthropomorphic concept of divinity and are concerned about the passage of the soul to the afterworld.
8. When applied locally as drops or a spray, amphetamine, ephedrine, hydroxyamphetamine, mepherentermine, methoxamine, and phenylephrine, among others, are effective in relieving nasal congestion, respiratory allergies, or sinusitis, although aftercongestion may follow.
9. The resulting ash is harmless, the afterheat in the reactor structure would be much less than in a fission reactor, and the heat would be distributed through a greater thermal mass.
10. A tax on corporate income taxes the stockholder several times because corporations pay income tax on the money they pay out as dividends and then the recipient of the dividend must pay personal income tax on the dividend. Furthermore, stock is bought with after-tax income; then, when the stockholder is paid a dividend from the corporation or sells the stock at a profit, the income earned is taxed again.

Task 4.2. Translate the sentences, determining the appropriate way to translate terms with the prefix *co- :*

1. His Nobel co-recipients were Wolfgang Pauli (for his work in the same area) and Norman F. Ramsey.
2. He was succeeded by his daughter Amalasuntha, who was murdered in 535 by her husband and co-ruler.

3. The German physicist Gerd Binnig, bom July 20, 1947, is the co-inventor, with Heinrich Rohrer, of the scanning tunneling microscope (STM).
4. Carl Bosch, bom Aug. 27, 1874, d. Apr. 26, 1940, was the co-winner (with Friedrich Bergius) of the 1931 Nobel Prize for chemistry for his research in high-pressure synthesis.
5. Contrarotating propellers (contraprops) have two sets of blades that turn in opposite directions on the same axis. They may be driven by the same engine or by two different engines; in the latter case, the term co-axial propellers is often used.
6. In the 1960s the Soviet Union developed two unique space weapons systems, the "killer satellite" and the "fractional orbit bombardment system" (FOBS). The former program involved two dozen tests of a co-orbiting spacecraft (first flown under the cover name Polyot) that closes in on a target and fires a burst of shrapnel at it.
7. Bruner taught from 1945 to 1972 at Harvard University, where he was a founder (1961) and co-director of the Center for Cognitive Studies.
8. If a man marries two living sisters, usually because he was taught to believe that sisters can get along as cowives better than unrelated women, that, too, may be called ***sororate.***
9. He earned a law doctorate from the University of Amsterdam in 1860 and taught law there from 1862 to 1893. In 1869 he was a co-founder of the Journal of International Law and Comparative Legislation.
10. Many of Binford's ideas have been incorporated in the theory and methodology of modem archaeology and can be found in the book he co-edited, New Perspectives in Archaeology (1968).

Task 4.3 Translate the sentences, determining the appropriate way to translate terms with the prefix *dis-:*

Section A. 1. A single-cylinder Stirling engine has five major components: an engine heater, a regenerator, an engine cooler, a displacer piston, and a power piston. 2. Some of the zinc is dissolved in the chemical reaction that causes precipitation, and the remainder disappears in the smelting of the metal. 3. Substances used to eliminate, chemically change, or mask an odor - deodorizers - act by absorbing odorous molecules, by dissolving or emulsifying them, or by killing the bacteria that cause odors. 4. Poisonous and caustic, depilatory creams may bum or disfigure the skin. 5. A disadvantage of ethyl and methyl alcohol is that they evaporate in water solution and must be replaced each year. 6. After a lengthy period of disuse in Europe, public baths were revived with the resurgence of the cities in the 11th and 12th centuries. 7. These objects may be dislodged by the powerful magnetic field.

Section B. 8. Most of the radioactive isotopes found in nature are members of a radioactive disintegration series that begins with a radioactive isotope of uranium, actinium, thorium, or neptunium. 8. They are all reactive, and all have a disagreeable odor. 9. As an example, a compound that has four dissimilar atoms bonded to a carbon atom can have one of two configurations because of the tetrahedral form of the carbon atom. 10. The Jordan curve theorem, named for French mathematician Camille Jordan,

states that any simple closed curve in a plane separates the plane into three disjoint sets: the curve itself, its interior, and its exterior. 11. Rehabilitation medicine tries to eliminate the disability or to moderate its impact by retraining the disabled person to live as normal and productive a life as possible.

Section C. 12. The Gulag administration itself was dismantled after Stalin's death, but forced labor camps continued to exist until the end of the Soviet period. 13. Adams declared that future negotiations would have to be concerned not only with disarmament of the IRA, but also with the "demilitarization" of Northern Ireland, understood as the gradual withdrawal of British troops. 14. Nationalist leaders were dissatisfied with French plans to establish a semi-independent state in Laos. 15. Proud of her middle-class, nonconformist, small-town background, Thatcher extolled the virtues of freedom, hard work, thrift, and personal responsibility, and had a strong dislike for socialism.

Task 4.4 Translate the sentences, determining the appropriate way to translate terms with the prefix *ex- :*

1. Many ex-patients were placed in boarding houses and nursing homes (which have now become the largest locations of care for mentally ill people).
2. In self-help groups therapists share the characteristics of their patients. Exalcoholics, for example, serve as therapists for alcoholics.
3. The number of exprisoners who are rearrested within three years of their release is estimated at about 60 percent.
4. Former Communist party members and ex-convicts are prohibited from holding union office until 5 years have elapsed.
5. Finally, some cults generate violence or criminal conduct from members. Violence is frequently directed at nonmembers or ex-members who are labeled as threats to the group's leadership.
6. The initial peace plan, formulated by ex-U.S. secretary of state Cyrus Vance (for the UN) and Great Britain's Lord Owen (for the EU) aimed at preserving Bosnia as a multiethnic state under its Muslim president, Alija Izetbegovic, dividing the country into ten autonomous districts.
7. They favored a rapid Reconstruction that would make few demands on the ex-Confederates.
8. The Belgians assumed that Baudoin would remain king of the Congo and that the ex-colony would remain tied economically to the mother country.
9. The speaker of the narrative is ex-lawyer, ex-Parisian Jean-Baptiste Clamence, who owns the bar in Amsterdam that is the site of his examination of and expiation for his sins.
10. Many ex-patients were placed in boarding houses and nursing homes (which have now become the largest locations of care for mentally ill people).
11. Finally, some cults generate violence or criminal conduct from members. Violence is frequently directed at nonmembers or ex-members who are labeled as threats to the group's leadership.

Task 4.5 Translate the sentences, determining the appropriate way to translate terms with the prefix *extra- :*

Section A. 1. Exobiology, study of the conditions necessary to support the independent development of extraterrestrial life. 2. The most extensive extra-high-voltage (EHV) underground cable system at present is the 345 kV network that supplies the New York City area. 3. Some writers propose that an undiscovered species of ape or a last survival of Neanderthal man may explain the sightings; others go so far as to link them with extraterrestrial beings. 4. Such a situation is an incentive for holders of foreign currencies to engage in extralegal currency exchanges rather than to use the less profitable exchanges at official rates. 5. In the whole animal an increase in size can be the result of an increase in cell number, or an increase in cell size, or an increase in the amount of extracellular material, or a combination of all three. 6. In general, extraterritorial jurisdiction is most frequently exercised by consuls and diplomatic agents in specific countries, who, in addition to their ordinary consular duties, are vested with judicial powers.

Section B. 7. The term "homeostasis" was coined by Walter Cannon in 1926 to refer to the body's capacity to regulate the composition and volume of the blood, and hence all the fluid bathing the cells of the body - the "extracellular fluid". 8. Religion has played a major role in defining sexual ethics; for example, it can influence attitudes to, among other things, birth control, marriage, and extramarital sexual activity. 9. Extrasensory perception (ESP) is defined as the ability to acquire information without the use of the senses, and includes telepathy (when the information comes from another person). 10. Such a ship was steered by an extra-large oar slung over one quarter for which the word steerboard was coined - hence the term starboard for the right side of a ship. 11. In video recording the recording heads are mounted in a rotating drum whose motion increases the relative tape- to-head speed without actually driving the tape at extra-high speeds. 12. Since the establishment of the National Endowment for the Arts in 1965, a number of public and private authorities increasingly have stressed the study of the arts not for their distinctive values but rather for their instrumental uses in attaining a number of extra-aesthetic objectives, both academic and social.

Section C. 13. Another term of Hymes's, communicative competence, points up the need for linguists to go beyond Chomsky's goal of understanding an individual's ability to create and apprehend sentences and to analyze such extra-sentence-processing abilities as knowing when to speak and when not to speak, knowing the kind of speech appropriate to different occasions, and knowing how to construct and recognize discourses connecting many sentences, such as extended jokes or directions. 14. The competition to enter a prestigious university is so severe that a large number of juku (extra-hour schools) operate to prepare students for the entrance examination. 15. Astrogeology applies principles of geology, geochemistry, and geophysics in the study of extraterrestrial solid matter such as asteroids, comets, and planets and their satellites. 16. Extravehicular activity (EVA), or spacewalking, poses a special health hazard. The astronaut or cosmonaut must rely on the perfect functioning of a spacesuit and may have to experience changes of atmosphere and pressure between spacecraft cabin and

spacesuit that can result in decompression sickness. 17. Extragalactic systems are the enormous assemblages of stars found outside the Milky Way Galaxy. 18. The transient disturbances that occur in the upper-level jet stream are responsible for much of the weather variations in extratropical latitudes.

Task 4.6 Translate the sentences, determining the appropriate way to translate terms with the prefix *heter(o)-:*

Section A. 1. In organic chemistry, a heterocyclic compound, or heterocycle, is a ring compound containing two or more different elements in the ring. All the numerous heterocyclic compounds that occur in nature contain rings consisting of carbon atoms and one or more atoms of nitrogen, oxygen, or sulfur. 2. Autosomal dominant genes, of which more than 4,000 are fully identified, are expressed in both heterozygous and homozygous individuals. 3. Autotrophs ("self-nourishers," also called producers), which are mainly green plants, manufacture their own food from carbon dioxide, water, minerals, and sunlight, whereas heterotrophs - a wide assortment of organisms - lack the metabolic machinery to synthesize their own food and must obtain it from other sources. 4. Heterotrophic organisms, such as animals, ingest preformed nutrients - that is, other life forms or their products. 5. This activity seldom indicates future homosexuality but may worry the participants and parents. As they become more secure, youngsters begin some heterosexual experimentation. By the mid-teens, pair dating has become the preferred heterosocial activity for most.

Section B. 6. Ring systems that contain atoms other than carbon atoms within the ring structure are called heterocycles. Many have long been known by trivial names, which serve both as parents for naming derivatives and for naming other heterocyclic compounds. 7. Further controversy was aroused by their 1988 publication *Crisis: Heterosexual Behavior in the Age of AIDS,* in which they forecast an epidemic spread of AIDS among heterosexuals. 8. Heterosexual transmission AIDS in the United States accounts for about 8 percent of cases but is rising; it is a significant mode of transmission in Africa and Asia. 9. Bayezid failed to suppress revolts by nomadic Turkoman tribes in eastern Anatolia despite their connection with the heterodox Safavids, who were then conquering Iran. 10**.** Based on his child-development studies, Piaget found tha. the young child has a "heteronomous" morality: the child's notions of right and wrong are imposed from without and accepted as unbreakable rules, without the mediation of thought or judgment. 11. A neuron usually is considered multipolar, referring to the many processes emanating from the soma, and heteropolar, because these processes are anatomically distinct (axons and dendrites).

Section C. 12. Early liturgical polyphony, like Russian folk music, was heterophonic - that is, it consisted of a single melodic line with simultaneous variations. 13**.** Thus, while transistor designs using a single semiconductor can only vary the amount and kind of doping, with these materials the energy gap can also be varied from one part of a transistor to another. The heterojunction emitter bipolar transistor is a prominent example of this possibility. 14**.** Spore-bearing leaves and the free release of unlike spores (heterospory) appeared, as well as forerunners of true seeds. 15. Most

transvestites are heterosexual and are not interested in changing, by way of sex-reassignment surgical procedures, into the opposite sex.

Task 4.7 Translate the sentences, determining the appropriate way to translate terms with the semi prefix *homo- :*

Section A. 1. In selecting a spouse, most people choose from groups of people similar to themselves, a tendency that social scientists term homogamy. 2. The thermosphere is the only heterogeneous atmospheric layer. Vertical mixing takes place in the lowest 80 km (50 mi) of the thermosphere, sometimes called the homosphere. 3. In homonuclear covalent bonds (bonds between identical atoms in a molecule), the electrons are equally shared by the two nuclei. In these molecules the bonds are termed nonpolar covalent. 4. Polymers are of two types: addition (repeated homo-addition of an unsaturated monomer to a growing chain) and condensation (loss of a small volatile molecule, usually water, between reactive ends of two polyfunctional molecules.

Section B. 5. One of the many talented mathematicians and astronomers to pass through Plato's Athenian Academy was Eudoxus of Cnidus, whose theory of homocentric spheres contributed to the concept of planetary motion, and whose theories of magnitude and exhaustion helped to advance geometry. 6. A bond formed by the sharing of electrons by more than one atomic nucleus is called a covalent bond. In homonuclear covalent bonds. 7. Uniclinal structures, or homoclines, are formations of gently dipping rock strata to which a regional tilt has been imparted. 8. Vertical mixing takes place in the lowest 80 km (50 mi) of the thermosphere, sometimes called the homosphere. 9. Tracheo- phytes are further characterized, however, as being either homosporous (producing only one kind of spore) or heterosporous (producing two types of spores).

Task 4.8 Translate the sentences, determining the appropriate way to translate terms with the prefix *mis- :*

1. The procedure has been shown to increase the risk of subsequent miscarriage by 0.5 per cent.
2. The aminoglycosides cause the genetic message to be misread and a defective protein to be produced.
3. Friction and antifriction are misleading terms. Neither type of bearing is completely ffictionless, and both are highly efficient in reducing friction.
4. Contacts with Yugoslavia were strained because of what the Albanian government alleged was mistreatment of some 2 million ethnic Albanians in the southern Serbian province of Kosovo.
5. According to the positivists, the task of philosophy is the clarification of meaning, not the discovery of new facts (the job of science) or the construction of comprehensive accounts of reality (the misguided pursuit of traditional metaphysics).

Task 4.9 Translate the sentences, determining the appropriate way to translate terms with the prefix *non-:*

Section A. 1. The term ***automation*** has also been used to describe nonmanufacturing systems in which programmed or automatic devices can operate independently or nearly independently of human control. 2. Nonproductive consumption may result from the decision of a private individual or family to purchase particular goods or services. 3. Compounds that contain both a metal and certain nonmetals, particularly those containing carbon, are also called alloys. 4. The study of non- Euclidean geometry and the geometries of spaces that have more than three dimensions would not have been possible without the analytic approach. 5. A profound problem for particle physics and for cosmology in general is the apparent scarcity of antiparticles in the universe. Their non-existence, except momentarily, on earth is understandable, because particles and antiparticles are mutually annihilated with a great release of energy when they meet.

Section B. 6. The first strand concerned the impact on the natural environment of technological activities - pollution and wastage, and the high consumption of natural, in particular, nonrenewable resources. 7. Cosmologists believe that the small ripples in the background radiation are left over from non-uniform regions that were present in the universe soon after the big bang. 8. If the bonded atoms are nonmetals and identical (as in N2 or O2), the electrons are shared equally between the two atoms, and the bond is called ***nonpolar covalent.9.*** Cars were originally equipped with nonhydraulic brakes, applied to the rear wheels only. 10. In its simplest form a capacitor consists of two metal plates separated by a nonconducting layer called the dielectric. 11. BASIC (***Beginner's All-purpose Symbolic Instruction Code)*** was developed at Dartmouth College in the early 1960s for use by non-professional computer users.

Section C. 12. Concrete masonry is used for load-bearing and nonload- bearing walls. 13. Nonstatic models of the universe were developed in 1917 by the Dutch astronomer Willem de Sitter, in 1922 by the Russian mathematician Alexander Friedmann, and in 1927 by the Belgian abbot Georges Lemaotre. 14. Dark matter is a nonluminous material that cannot be directly detected by observing any form of electromagnetic radiation, but whose existence, distributed throughout the universe, is suggested by certain theoretical considerations. 15. A wide range of commercial, governmental, and nonprofit databases are available to the general public and may be used by anyone who owns or has access to the equipment that they require. 16. Of the two classes of non-tectonic earthquake, those of volcanic origin are seldom very large or destructive. 17. Materials in which the electrons are tightly bound to the atoms are known as insulators, nonconductors, or dielectrics.

Section D. 18. In current world markets, with the price of most nonferrous metals at an all-time low, exploration for metallic mineral deposits is confined largely to precious metals, and the chief targets of geochemical prospecting are gold and platinum-group metals. 19. Nonatmospheric engines are usually called rocket engines. 20. As a consequence the Pythagorean theory of ratio, based on numbers, had to be abandoned and a new, nonnumerical theory introduced. 21. Naturally occurring

uranium contains only 0.71 per cent uranium-235; the remainder is the non-fissile isotope uranium-238. 22. Useful results can be obtained by treating the ever-changing surface as the sum of a large number of non-interacting, simple waves. 23. Planographic plates have image areas on the same plane as the nonimage areas and therefore require that the nonimage areas be treated to repel ink.

Task 4.10 Translate the sentences, determining the appropriate way to translate terms with the prefix *omni-:*

1. In philosophy and theology, divine immanence refers to the omnipresence of God in the universe.
2. For amplitude-modulated (AM) broadcasting, an omnidirectional antenna (one that transmits in all directions) is normally used.
3. In Communist countries, government bureaucracy was an omnipresent fact of life.
4. Comenius envisaged educated people as those who sought knowledge from all sources in order to become more like the God in whose image they were made - omniscient and universally compassionate.
5. Because the human diet is typically diverse, human beings are classified as omnivores rather than as herbivores (plant eaters) or carnivores (meat eaters).
6. The ancient Germans worshipped a variety of gods and goddesses, whom they viewed as powerful but not as omnipotent or eternal.

Task 4.11 Translate the sentences, determining the appropriate way to translate terms with the prefix *over-:*

1. Overreliance on chemical pesticides has had deleterious consequences.
2. Malignant melanoma appears to be more common in those overexposed to the Sun in childhood, and it metastasizes early and widely.
3. In particular, lithium, beryllium, and boron are significantly overrepresented in galaxies.
4. Again, interference occurs in the region where the beams overlap.
5. Nonoverflow dams are those designed not to be overtopped, and they may include earth and rock in their structure.
6. As a result of European postwar poverty and U.S. overproduction, however, farmers experienced a depression lasting from 1922 to 1927.

Task 4.12 Translate the sentences, determining the appropriate way to translate terms with the prefix *para- :*

1. Some parapsychologists adopt the view that psychic phenomena are outside the realm of science, whereas others believe that breakthroughs in particle physics may one day provide explanations for such phenomena.

2. Physician assistants, who are graduates of intensive 2-year programs approved by the American Medical Association, are paramedics skilled in taking case histories, giving medical examinations, making diagnoses, and providing basic medical care.
3. Several different types of magnetism exist: they are called diamagnetism, paramagnetism, ferromagnetism, ferrimagnetism, and antiferromagnetism.
4. Paralegals work under the supervision of lawyers and may not give legal advice requiring the exercise of independent legal judgment, represent clients in litigation, or fail to disclose that they are not attorneys.
5. The parathyroid hormone, called parathormone, regulates the concentrations and balance of calcium and phosphate ions in the blood.
6. Psychokinesis includes telekinesis, the paranormal movement of objects; levitation and materialization; mysterious events associated with given people or houses such as rappings, overturned furniture, and flying objects; and paranormal healing.

Task 4.13 Translate the sentences, determining the appropriate way to translate terms with the prefix *quasi- :*

1. He designed such varied works as Italianate villas, Gothic cottages, and quasi-medieval castles.
2. The exchange rate mechanism is the most notable quasi- fixed exchange rate arrangement since the breakdown of the Bretton Woods system.
3. In 1802, in his celebrated "Heiligenstadt Testament", a quasi-legal letter to his two brothers, he expressed his agony over his growing deafness.
4. Yet they also reveal an individual expressiveness, in particular an atmospheric, quasiatonal harmonic language and a tendency to treat voices almost instrumentally.
5. After the Norman Conquest, Dover was enfranchised as one of the Cinque Ports (a quasi-independent group of five English Channel ports supplying naval defence).

Task 4.14 Translate the sentences, determining the appropriate way to translate terms with the suffix *ism- :*

1. A magnetic compass mounted on a steel ship is influenced by the ship's magnetism. Magnetic correctors, therefore, are used to neutralize this magnetism at the compass position so that the needle system is influenced by the Earth's magnetism only. In aircraft the magnetic compass is often located at a position outside the cockpit where the magnetism of the craft has the least effect.
2. In the 1960s, when social consciousness was on the rise, industrial designers began to criticize their own commercialism.
3. Numerous critics have pointed out broadcasting's tendency toward escapism. In 1927, H. G. Wells condemned radio as useful only to "very sedentary persons living in badly lighted houses or otherwise unable to read.. .and who have no capacity for thought or conversation."
4. In the United States around the same time, influential social scientists associated with the philosophical movement called pragmatism saw the new mass media as vehicles for

developing forms of interaction and community appropriate to an increasingly urban and industrial world.
5. In this next stage of metabolism, namely, the breakdown of pyruvic acid in the presence of oxygen, much larger amounts of energy are liberated

Task 4.15 Translate the sentences, determining the appropriate way to translate terms with the suffix *oid- :*

1. In dealing with gravity measurements, scientists refer to an idealized Earth shape, the reference spheroid. Another shape, the so-called geoid, is an ideal one on the surface of which all points would experience equal gravitational force.
2. An ellipsoid is a three-dimensional surface of such shape that any plane section of the surface is either an ellipse or a circle.
3. The organisms in this division grow as multinucleate amoeboid plasmodia and produce motile uninucleate amoebae, as well as biflagellate cells.
4. For example, the centroid of a straight line is the midpoint of the line and the centroid of a circle is the center, which is why a waiter or waitress balances a tray of dishes at its center.
5. Chloro- plasts are generally 4 to 6 microns in length, 1 to 2 microns in width, and discoid or ellipsoid in shape.

Task 4.16 Translate the sentences, determining the appropriate way to translate terms with the suffix *ologist- :*

1. The French physiologist Pierre Flourens removed or destroyed specific parts of an animal's brain tissues to see the differences in outcome.
2. The archaeologist attempts to reconstruct the past by analyzing, dating, and comparing systematically excavated sites and artifacts.
3. Soon afterward the basic neural structure of the brain unfolded as a result of the work of Camillo Golgi, an Italian histologist who developed a method for staining cells, and the Spaniard Santiago Ramon y Cajal, who improved the method and used it to trace brain cells.
4. The Soviet neuropsychologist Aleksandr Luria, a major figure in this development, suggested that psychological functions are hierarchical and that broader functions may not be localized because they comprise more narrow functions that are localized in different brain structures.
5. The dermatologist must understand the systemic diseases likely to be responsible for a skin rash, just as the internist or pediatrician examines the skin as a first clue to underlying disease.
6. Although the field is classified as a surgical specialty, the otolaryngologist also treats nonsurgical conditions of these structures.
7. The anatomic pathologist examines tissues obtained during surgery or at an autopsy and also examines cells from body secretions.

8. In recent decades, with the advances made in surgical procedures, the functions of the anesthesiologist have become correspondingly complex.
9. The ophthalmologist treats medical and surgical eye conditions and is concerned with the prevention and treatment of blindness.
10. Apart from the social relationships in which they are taught and learned, such activities are not of primary concern to the sociologist; they are instead studied by the cultural anthropologist, who may take the entire culture of a society, from marriage customs to magic, as a field of inquiry.

Task 4.17 Translate the sentences, determining the appropriate way to translate terms with the semi-suffix *–worthy:*

1. Powered by four 3,800-horsepower gas-turbine engines that drive four lift fans and four swiveling air propellers, these big craft cruise smoothly at up to 77 knots, making them the fastest class of seaworthy water vehicles in the world.
2. The flight demonstrated that the vehicle was spaceworthy for the duration of a lunar mission.
3. By the late Middle Ages the ancient Chinese sailing ship had evolved into the junk, one of the world's strongest and most seaworthy ships.
4. After the major components of the steering and propulsion systems were installed the ship was launched. An extensive amount of outfitting and finishing, however, was still required before the ship was seaworthy.
5. Banks have a particular advantage in making loans to corporate accounts that are constrained in borrowing directly from the public (through issuance of bonds and other securities) because the public cannot judge whether they are creditworthy.
Hearsay is not always rejected.
6. The law recognizes a number of situations in which evidence may be considered sufficiently trustworthy even though it is plainly hearsay.
7. The rationale behind the tort of negligence is that even though an injury may not have been intentional, it nonetheless may be blameworthy because the defendant did not use reasonable care under the circumstances.
8. The cactus family contains numerous attractive and noteworthy members.
9. A noteworthy feature of the fern's reproduction cycle is that two very different reproductive forms exist in every species, a phenomenon known as the alternation of generations.

UNIT 5. GRAMMATICAL STYLE PECULARITIES OF THE SCIENTIFIC AND TECHNICAL TEXTS

Task 5.1 Translate the sentences, paying attention to the choice of an adequate way of translating the forms of a verb in predicate:

Section A. 1. Definite proof to that effect is lacking. 2. Evidence is mounting up that the bacteria may undergo some kind of transmutation. 3. The spherical joint is becoming more and more useful in the construction of glass equipment. 4. I do not want to suggest that the distinction I am making is an easy one to maintain in all cases. 5. In the next chapter, I first outline a framework developed of the results' interpretation. 6. This value may be subject to refinement when analyses are complete. 7. As further evidence for this restriction I examine below other processes that have been shown to be non-dominant. 8. I argue in the following two chapters that this structure is one means by which tenable interpretations are sustained. 9. A completely new conclusion must be formulated which considers all valid models. 10. In the next chapter I demonstrate that this problem cannot be solved along these lines. 11. I mention now another category of facts never integrated in the field — perhaps because they are too precise! 12. It seems that some kind of statistical method might be helpful, provided a representative body of instrumental data gathered becomes available.

Section B. 13. In this final section 1 summarize some of what I take to be my more significant conclusions. 14. What I am suggesting is that this is not necessarily a consequence of the impact. 15. For that reason, in the next chapter I concentrate only on a subset of the variables. 16. In the following, I first briefly describe the major arguments made by this approach, point out what I see as defective with those arguments, and then proceed to argue why the separation of the two categories is impossible in the analysis. 17. The absence of major theoretical issues which are being contested makes these chapters somewhat dry reading. 18. It seems to me that Earl is here introducing the wrong distinctions and omitting the right ones. 19. A team of scholars at the University of Nancy is preparing a more detailed analysis of these problems, so we may look forward to the results of their investigations. 20. This problem has been later acknowledged by Peters, but it has not been taken up by him in any significant way. 21. This view has come under considerable criticism. 22. My effort to do just that has led to two conclusions. 23. First, this approach has led to a highly coherent and (I hope) revealing analysis. 24. No critical experiment has been reported up to now. 25. Another such argument has been advanced by Kostler (1992).

Section C. 26. There have been several attempts to put these arguments on a quantitative basis. 27. These assertions have engendered a lively debate, and many less than critical scholars have accepted their conclusions enthusiastically. This idea has been implemented in various ways. 29. This theory, and every hypothesis which contributed to it, have been subjected to extensive criticism. 30. I have not attempted, in this article, to offer even a brief overview of the analytic methodology and techniques. 31. This astute observation has, unfortunately, been ignored by subsequent researchers. 32. However, as we have demonstrated, these apparent restrictions all follow from a

more general constraint. 33. In this study, I have not hesitated to use techniques and ideas that are presently outside the range of this analysis. 34. Unfortunately, he commits the same error that other theoreticians have made since the conception of the theory: he does not apply the same cautionary procedures to "internal" evidence. 35. He has in fact misunderstood my position on both of these questions, in spite of quite explicit statements in the passages to which he referred. 36. We have made this assumption throughout; and it can be tested empirically in a sufficient number of instances for us to accept it as valid. 37. This framework has attracted many researchers to this day, and the influence can be most clearly seen in the works of Taller (1989, 1991a, 1991b, 1993), which directly apply and advocate this approach. 38. Of course, this is an old problem to which there has been no satisfactory solution; our analysis is no worse that any other in this regard.

Section D. 39. He has chosen not only to disagree with these views of foreign scholars; he has chosen not to represent their views at all. 40. Theorists have typically attempted to meet the challenge of new problems in those different and opposing ways. 41. In his eagerness to use whatever stone comes to hand, he has taken contradictory positions, has made careless errors in interpreting (and even in quoting) other authors. 42. The shortcomings of her analysis of this problem and the different aspects of the problem have been discussed carefully by Lang (1994). 43. Finally, I observe that the data which I have discussed here show to be completely untenable the familiar proposal of Frey (1991). 44. They had been through with their series of experiments by the end of 1990. 45. In 1968 Altier and Franck pointed out the importance of that solution, but Crane had suggested it in the same year. 46. It is the study of Thome (1992) that has yielded the most fruitful results. 47. Such studies have been done, for example, by West (1994).

Task 5.2 Translate the sentences, paying attention to the choice of an adequate way of translating the verb in predicate in subordinate clauses:

Section A. 1. He claimed that Gibbs (1989) had earlier suggested such a solution. 2. The investigators noted that the two variables had three levels. 3. We learnt that the results reported by these scientists were erroneous. 4. They concluded that his ongoing project was also a failure. 5. In Larson (1992) he agreed with Jabrdon that the analysis was hard to take seriously for other reasons. 6. He showed that it was 02 that had the most similarities to 05. 7. The originators of the theory argued that it was essential .to take such relations as primitives. 8. According to the procedure, pupils were told to indicate whether each sentence was correct or incorrect. 9. The experimenter explained that the child would hear the animals' names. 10. The 10-year-olds knew why they felt "something was wrong" with the sentences. 11. Results shoed that the relative frequencies were significantly different. 12. Their results demonstrated that such an event could have happened even before the date. 13. Friesen (1993) insisted that this class of variation had already been studied, presumably by Kuiken (1991). 14. The subjects were told that the names would be read in numerical order. 15. The experimenter asked pupils how they would "fix up" the sentences given.

Section B. 16. He suggested that comprehension in such cases is a matter of "grasping the simplest relation". 17. Thus we predicted that preschoolers would show mainly similarity confusions in a memory task. 18. To avoid bias, the child was told that he would meet some new names of animals. 19. The results of the study indicated that increases and decreases of intensity were accompanied by similar changes in rates of movement. 20. Pupils in grade 4 were told that they would be given sentences with a blank line to the left of each. 21. It was hypothesized that both frequency and intensity are positively related to perceived speech rate. 22. Fedron and Bond (1993) argued that the alternative explanation could be accepted. 23. Finally, they pointed out that the duration of the stimuli was the same across and within groups. 24. Moreover, a study of Follman, Merica and Silverman (1995) seemed to indicate that neither the direction nor the order of the categories significantly affects the reliability of a scale or the mean yields. 25. Earlier, I thought that we could drop the third analysis (summarized in 7) from consideration. 26. As Faltz (1988) rightly pointed out, it would have been much better to use another term. 27. In my personal communication with him I had to admit that 1 refused the claim that he attributed to me. 28. They failed to remember that any choice among alternative analyses may imply a choice among alternative general theories. 29. The most thorough study of this variation that I know is by Eblands (1989: 82-89), who found that 25b was impeccable for everyone, but some researchers rejected 25c. 30. The ancient Greek philosophers reasoned that matter was made up of infinitely small particles.

Task 5.3 Translate the sentences, defining if the verb *to be* is modal:

Section A. 1. The latter approach is therefore to be preferred. 2. However, the increased complexity of the theory is to be desired. 3. The same idea is to be found in Anderson 1994. 4. We will show that much is to be learned by overcoming this neglect. 5. Footnotes are to be used only for substantive observations. 6. Some explanation is surely to be found for this not uncommon situation. 7. In fact, as this collection of articles makes clear, such a claim is not to be made. 8. It is to be hoped that the current interest of scholars in his work will be stimulated. 9. The value of his research is certainly not to be underestimated. 10. It is hard to see how we are to be convinced of the nature of this principle. 11. However, it is difficult to tell why his theory is to be preferred over possible alternative formulations. 12. Despite these flaws, the paper is to be recommended, even for readers not particularly interested in the theory per se. 13. Analogous remarks are to be made about similar arguments. 14. This involves showing that the fact in question was necessary and inevitable - that it was to be expected. 15. The variety of empirical methodologies which Gerhardt brings to bear is certainly to be commended. 16. Nevertheless, the editors are to be credited for putting together studies which represent the diversity of current research.

Section B. 17. Carrington is to be commended for his persistence, and to be congratulated on the technically polished form of the final book. 18. I am indebted to Alan Prina for the observation that if this convention is to be maintained universally, then the analysis above must be modified. 19. This program was to furnish validation

data for theoretical models. 20. Such a view is to be found, for example, in such influential writings as Davidson's and Dummet's. 21. However, the differences between these approaches are to be resolved. 22. Randomness is not to be positively defined, but is a theoretical tool that one poses and adopts in so far as its use helps to understand scientific facts. 23. This is not to disagree with his central contention. 24. This is not to say that there are n o exceptions. 25. This is not to say that such facts cannot be described by a simple procedure. 26. This is not to say that no agreement as to the details of the process has been reached. 27. This is not to say that the paper does not contain interesting comments and insights, but it promises more than it delivers. 28. This is not to deny, of course, that he is absolutely correct in this respect. 29. This is not to say that historians' work can be approached without caution. 30. This is not however to say that discovering a rule would be a matter of finding anything like the method. 31. This is not to deny the obvious value of the collection, but only to clarify its objectives.

Task 5.4 Translate the sentences with formal subject *there*:

Section A. 1. There is much that is right in this account. 2. And there are a few errors of fact here. 3. There is indeed very little to be said about this position. 4. There is also a partly annotated bibliography and an index. 5. There is no reason why this cannot be made explicit. 6. There are a number of reasons to rule out this possibility. 7. There is little hint, however, of what this move will amount to. 8.' Ve hypothesize, however, that there was such a stage. 9. There are several proble: is with this objection. 10. There are two problematic issues here. 11. But there is i i error in this section, caused in part by the approach. 12. There is a third, somewh; ; less salient argument against this analysis. 13. There are two serious problem with this proposal. 14. Finally, there are methodological issues to address. 15. There is also the vexing problem of circularity: how do we know what is relevant? 16. These papers show that currently there are more issues than answers. 17. There has been a revolution in the technology of observation in the last couple of decades. 18. There may be compelling reasons for rejecting such an interpretation, but none is mentioned in the paper. 19. There are a number of problems with this idea, independent of its peculiar implementation. 20. Moreover, there seems to be a problem in the use of this term itself.

Section B. 21. There exists an obvious alternative analysis of these examples. 22. But there would have to be some other mechanism for dealing with the optional positions. 23. But how adequate is this assessment? There seem to be two points regarding this position that are worth questioning. 24. There remain to be noticed two or three other points. 25. So far as I know, there is absolutely no disagreement over these judgments. 26. There appears to be a need for more investment of resources into developing more effective research techniques. 27. There follow a relatively brief conclusion, two copious bibliographies, plus a two-column index. 28. Flowever, there exists an alternative analysis (Paul Crank, class lectures, spring 1994). 29. There is no such method and there is not likely to be any (at least in our lifetime). 30. As usual, there is something for everyone in this theoretical framework. 31. In any event, there is a glaring inconsistency involved in rejecting this possibility. 32. But there is no

comparable summary treatment of the other side of the question. 33. There is an index of names in the monograph, but none of terms or of topics. 34. In view of its importance, there have been surprisingly few experimental investigations of the issue. 35. In particular, there appear to be no grounds for the thinking that the alternatives to the approach offer a clearly superior solution to the fundamental problem.

Task 5.5 Translate the sentences with the pronoun *one* in the subject function:

Section A. 1. One might try to defend this claim. 2. One could simply accept this symmetry. 3. One can hardly disagree with this research strategy. 4. One could not, however, expect to find a major contribution here. 5. As one might guess, these topics are highly interdependent. 6. Moreover, one must doubt the representativeness of the data. 7. One could go further than this and claim just the opposite. 8. Rejecting this view, one can argue that these features construe the event. 9. The data were quantified and, one assumes, submitted to statistical testing. 10. One is not required to know much about the theory before reading it. 11. Passing now to criticism, one regrets that the author often lapses into social-science jargon. 12. One is naturally led to wonder how these changes are taking place. 13. One must note all the exceptions, even if one defers their consideration for later study.

Section B. 14. One does not need to be a believer in this theory to feel that some useful information has been lost here. 15. However, if one wanted to remain skeptical or agnostic on particular points, I think this is simply the best one can do. 16. One can set out from the facts that are more or less certain, gradually moving onto more speculative ground. 17. One must conclude that Froley, as editor, was either unaware of these projects, or that he tacitly condoned their suppression. 18. All this adds to our data base; and for this, one is grateful. But one also looks forward to attempts to write more relevant accounts. 19. One can only wish Mustakojaa luck, since it will be a giant accomplishment if he actually solves the problem. 20. One can hardly object to this as a sort of first approach. 21. One must be very careful in drawing conclusions from these data, however. 22. The author offered explications of his methods; but they are brief and one is left to figure out his conceptual methodology. 23. Prichard's hypothesis and procedures are thought-provoking, and one can have little quarrel with his use of statistics. 24. For scientific purposes and for policy decisions one wants to know which variables enter into causal mechanisms affecting other variables. 25. However, when the two techniques yield the same conclusion, one can be more confident that the conclusion is warranted.

Task 5.6 Translate the sentences, paying attention to the ways of translation of *one* in the subject function:

1. While solving a number of problems, the new one creates a few others. 2. No serious difficulties are foreseen in the construction of a projection stereoscope, if one were desired. 3. There are different kinds of propositions. The ones concerning logic and mathematics are analytical propositions. 4. These discoveries brought him the world

fame. Especially revolutionary was the one made in 1959. 5. There are several unequal alternatives. The one with the least efforts solution is very difficult to pursue. 6. This hypothesis, if one is to be advanced, will extend the principle to all branches of physics. 7. The choice of allowable analytical systems is in principle also very large. There are, for example, tight ones which are very powerful. 8. The observer knows from past experience that if two objects subtend the same solid angle with respect to the eye, the one which is farther away must be the larger. 9. There are clearly difficulties here that we might well discuss. The first one is that the empirical matters of fact in modern science are not simply "observed", but are nowadays more and more obtainable only by way of a detour of technology. 10 These two structures are the obvious candidates; some much less obvious ones are surveyed in Larson 1994, and Larson adds an interesting (and influential) one to the range of possibilities. 11 .This is an easy question to ask, if one is to be asked within this framework. 12. Another example of evidence, an early one, comes from Einstein's article on relativity published in 1907. 13. We are witnessing here an old conflict, one that has continued throughout the development of the sciences.

Task 5.7 Translate the following sentences, paying attention whether the pronouns *we, you, they* are indefinite-personal or not:

1. We started by noting an anomaly in the principle. 2. They have played fast and loose with many theoretical concepts. 3. To answer this, you need to be clear exactly what a process approach is. 4. We can place the following requirements on our theory. 5. You need also to bear in mind that some of the techniques do indeed need lots of preparation. 6. We may ask why there is a favoring of maximal interpretations. 7. We can see, then, how Banfield's analysis is not completely adequate. 8. We have said that the principle induces more informative interpretations. 9. As we can appreciate in Figure 2, it is nigh impossible to jump from premise 1 to premise 3.10. First, we must attend to a long-standing anomaly in the Kuhnian paradigm. 11. Every time we come across this kind of situation, we will be faced with the same problem. 12. What can we conclude from these attempts at definition? 13. We need, therefore, an explanation of how this is possible.

Task 5.8 Translate the following sentences, paying attention to the Gerund translation:

Section A. 1. Picking the correct terminology to refer to each of the rival methods is no easy task. 2. Proposing such a characterization will be the first order of our business. 3. Clarifying what counts as a "construction" would improve Costakis' analysis considerably. 4. Accepting this approach entails giving up analyses proposed by Kozma and Vaster (1993). 5. As will be seen below, taking a rule of thumb as an absolute guide can lead to all sorts of conceptual tangles. 6. Summing up, it appears that assigning a special function to the object under investigation does not solve the problem. 7. We believe that offering even a partial or open answer to the questions will

benefit both the theory and practice of our method. 8. Providing argument against those circulating in favor of the hypothesis became the best-known occupation of many University Departments. 9. Specifically, explaining the data in terms of these principles may purchase internal homogeneity and consistency in the picture at the expense of their perhaps wider significances. 10. Heating the gas increases the speed of its molecules.

Section B. 11. Translating from one language to another has been accomplished by computer. 12. Overheating an engine is prevented by providing a cooling system. 13. Launching a satellite is done by firing it from a multistage rocket. 14. Landing on Mars and getting home again is a problem which will be solved within the next ten years. 15. Landing on a celestial body that has no atmosphere can only be done by means ofretrorockets. 16. Measuring any quantity means comparing it with an accepted unit for that quantity and finding out how many times larger or smaller it is than that standard unit. 17. Cutting back this newly unleashed excess of theoretical power would give rise to a crop of unsatisfying stipulations of the very phenomena that deserve clear and revealing explanation. 18. Such considerations deserve attention; however, passing over them now will not detract from our general exposition of the hypothesis.

Task 5.9 Translate the following sentences, paying attention to inversion:

1. This identification I very strongly deprecate. 2. These he treated in terms of alteration. 3. This I call the Principle of Cross-Category Harmony. 4. This I will term alternation. 5. To this it may be objected that not all data have been examined. 6. That this can be true I cannot readily deny. 7. This they call Kepler's first criterion of reality. 8. This proposal Rogers puts forward rather vigorously but conclusively. 9. This again for my part I deprecate, since it would seem to commit both Alston and myself to a particular view. 10. The three items of the title of this piece I view as inevitably connected and urge that we apply the first of them to the problems of the other two. 11. Whether his individual arguments are successful I will leave up to the reader , though I find some a little shaky. 12. In the opening section he reviews a number of arguments of Rossi against Plough's analysis. Four he rejects as invalid or inconclusive. 13. Vacuum tubes are able to shift the frequency of a wave. This they are able to do by an electric "beat" action. 14. There is always a temptation in such analytical matters to go to an opposite extreme. This I shall seek to avoid. 15. To the question "How lawful is the Universe ?" we can only answer that we don't know for sure; but we assume it to be at least as lawful as our best current theories show it to be.

Task 5.10 Translate the following sentences, determining the way how to translate -ly adverbs:

Section A. 1. Here, oddly enough, Lehrer seems to agree. 2. Not surprisingly, many earlier treatments cite these as central examples. 3. Unsurprisingly, (a) is not acceptable in any framework. 4. Remarkably, the empirical findings suggest the opposite. 5. Strikingly, most of the effects follow automatically. 6. Admittedly, it is

much harder to keep one's thinking straight in the case of metalinguistic expression. 7. Oddly, there is not even a passing reference to the work of Edward Hall. 8. Crucially, then, the indication principle becomes superfluous because all its effects follow from broader principles. 9. Informally, there are the reasons why such constructions form a special class. 10. Interestingly, all of Aron's faults are of omission. 11. Paradoxically, the analysis uses a latter-day version of the method. 12. Presumably the claim would be even further cast into doubt by another examination. 13. Importantly, this argument does not apply to our treatment. 14. More specifically, there is nothing unusual about the notion. 15. Clearly, attention to history must be extremely selective. 16. More importantly, Krashen suggests possible solutions for certain mysteries in research findings. 17. More ambitiously, we might require that an analysis should be procedurally realistic. 18. Strictly, I have only considered the unavailability of the Fregean way of discerning a connection. 19. However, intriguingly, the approach advocated here would have the virtue of excluding another class of nonexistent formations. 20. Most notably, the theorem has been proved only in part.

Section B. 21. Surprisingly, these results can be shown to be mostly independent of his doctrine. 22. More specifically, we consider such theories strictly positive inductive definitions. 23. Clearly, there are many aspects that should be critically discussed. 24. Necessarily, the author is forced to ignore the large body of research. 25. More generally, one wants a solution in which this will be taken account of. 26. Importantly, they play a special role in this scientific paradigm. 27. Pretheoretically, such a solution envisages a matching of properties. 28. Typically, the program began with the graph. 29. Similarly, the approach itself can be attractive to a researcher. 30. Conceivably, they might be survivals of early traces. 31. Objectively, no two constituents of a substance are ever identical down to the smallest detail. 32. Additionally, it is estimated that many more researchers appreciate this approach. 33. In sum, and less tentatively, the analysis leads us to conclude the following. 34. Somewhat surprisingly, only two of the 21 papers are actual reports from on-going projects. 35. Annoyingly, the book is poorly edited, with spelling mistakes, typographical errors and inconsistent use of participant names across articles and appendices. 36. Ironically, however, there is a good, and generally accepted, likelihood that Aristotle's works were never meant for publication. 37. Significantly, these deficiencies can in large measure be traced directly to the one-dimensional nature of the theory.

Task 5.11 Translate the following sentences. Determine the appropriate way to translate the corresponding pronouns in the Object function.

1. In 2009 the Obama Administration had considered forcing banks to offer borrowers more lenient terms than the ones to which they had originally agreed, as a way of helping overleveraged homeowners. 2. For any business looking to expand and widen their reach, turning it into a franchise model is a great way to grow your company. 3. Facebook’s changes have helped make its ads almost as attractive as the ones next to search results, says Chris Tuff, an executive vice president at ad agency 22Squared. 4. Chen said his family money was invested in a «risk-averse way», much

of it in fixed income assets and funds of funds. 5. Total private-sector credit is growing at less than 4%, with a lot of it going to rich bond issuers. 6. Starting off the day in such a way allows one to work more effectively and be more creative.

Task 5.12 Determine the nature of parenthetical elements in sentences and translate them:

Section A. 1. They, it would appear, are not striving for new solutions. 2. Neither approach, as it happens, offers much insight. 3. In the end, this book probably reflects the current state of the field quite well. 4. Science, it must be remembered, was not Kepler's original destination. 5. In sum, then, it seems clear that the author has demonstrated no clear distinctions. 6. As far as the structure of a logical system is concerned, the distinction between assumption and axiom may not seem essential. 7. Again, if such an approach can be made to work, my book could be seen not as a total rejection of this notion. 8. Incidentally, I am somewhat surprised that Bombard does not refer more to the work both of Hodge and Lieuv 1988. 9. Clearly, much more work needs to be done on these interesting data. 10. In general, this book fails to be of academic interest or scholarly value. 11. As has become clear, I hope, it is necessary to evaluate fully the material from which the information is taken. 12. Secondly, and not unrelated to our teaching of undergraduates, there is the lack of a mnemonic for our own continuing understanding of what our life's interest is. 13. In short, the definitions are at least strange and scarcely conform to ordinary usage. 14. To be sure, the dream of portraying with an earlier kind of simplicity a more highly developed state of science is, and always has been, in an important way doomed to failure. 15. But, popular opinion holds, until the facts support such a position, any hypothetical statement is to be held scrupulously with open-minded skepticism. 16. To be sure, the separations between the nine components I have cited are not hard and fast.

Section B. 17. Balzmannn, he says, has written an exposition of Maxwell's theory and nothing better of its kind can be done. 18. The former, it is often said, does not preempt fundamental decisions on intuitive or aesthetic grounds.19. The right path, these men seem to say, is, in science as well as in all mythically driven activities, from the past through the unfolding present into a regained state of the past. 20. In essence, Bohr still hoped for the resolution between opposites by attending to an area where quantum theory and classical mechanics yield to each other. 21. It was indeed his professor Weber, who, Besso reports, said once to Einstein, "You are a clever fellow! But you have one fault: one can't tell you anything, one can't tell you anything !" 22. The motivation is, as it were, a longing to establish again an uncomplicated situation, a situation in which experience is dealt with in terms of one or a few large unities rather than detailed particulars. 23. Second, these models should not be identified with neural models. 24. That is, they characterize (in terms of beliefs0 what information a cognitive system has about its environment. 25. As has already been illustrated, Dry has no way of accounting for my results. 26.According to Banfield, Kierkegaard's existentialism was rooted in German Romanticism.27.In other words, his paper of 1990 was indeed one of a number of contributions by many different authors in the general field of the

electrodynamics of moving bodies. 28. In his essay in Schlipp's collection, Reichenbach reverts to the same points, but they are, as it were, only preludes to the conclusion that "it is the philosophy of empiricism, therefore, into which Einstein's relativity belongs".

Task 5.13 Pay attention to the translation of the Adverbial Modifier. Determine the method of translating -ly adverbs in the following sentences and translate them:

Section A. 1. Technically the book is very well done. 2. Our first aim is simply to see their role in science. 3. Logically this is not correct. 4. Formally, separation is achieved by making use of signed formulas. 5. Methodologically, two aspects of Dorth's work are worthy of note. 6. Historically, Olson is inclined, here and elsewhere, to attribute great influence to Luther. 7. Empirically, the theorem has a number of interesting consequences. 8. Contextually, Takeuti's justification of transfinite induction is questionable. 9. The radioisotope iodine-131 behaves chemically just like stable iodine-127.10. Scientifically, never had physics offered greater tasks and required better brains than now. 11. Theoretically, it is not expected to become part of the extra-logical axioms. 12. This organ, however, cannot be reached surgically without great risk and difficulty. 13. Galilean- Newtonian physics defined "force" quite differently. 14. Methodologically, all the empirical studies share a commitment to the study of raw materials. 15. Valid counterexamples would have to come from a nonliterate culture. Historically, these are hard to come by for obvious reasons. 16. Sociologically, scientific progress during periods of rapid advance in the first two decades of this century was somewhat different for experiment and for theory. 17. Methodologically, the most prominent feature of this collection is the extent to which the rich laboratory is being utilized to test current theoretical innovations.

Section B. 18, Thus Bertrand Russell speaks of cases "where the promises of science turn out to be a set of presuppositions neither empirically nor logically necessary". 19. The themata actually used in science are now largely left implicit rather than explicit. 20. And occasionally a great scientific theme disappears from view, or a new theme develops and struggles to establish itself - at least for a time. 21. To understand fully the role of a hypothesis or a law has in the development of science, we need to see it also as an exemplification of persistent scientific motifs. 22. The concept of force has empirical meaning because forces can be qualitatively discovered and, indeed, quantitatively measured by, say, the observable deflection of solid bodies. 23. And if we look carefully, we can find even among the most hard-headed philosophers and scientists a tendency to admit the necessity and existence of non-contingent dimension in scientific work. 24. This is the plane of public science, of fairly clear conscious foundations. Here a measure of public agreement is in principle easy to obtain, so that scientists can fruitfully cooperate or disagree with one another, can build on the work of their predecessors. 25. Thus too, Sigmund Freud in "Moses and Monotheism", after surveying the overwhelmingly unfavorable evidence standing against the central thesis in his book, would say in effect, "But one must not be misled by the evidence". 26. Of this no one has spoken more eloquently and memorably than Galileo when he commented on the fact that to accept the idea of a moving Earth one

must overcome the strong impression that one can “see” that the Sun is really moving.

Task 5.14 Translate the sentence, paying attention to the translation of the infinitive construction with the preposition *for* as a function of Adverbial Modifier:

1. But for operational rules to be lost, they must first be introduced.
2. For the explanation to work, it is essential that the process not undergo the same rule.
3. For this to be a very firm result, we would need to set up and test some hypotheses about the differences.
4. Further, for this argument to have any bearing on the choice between his analysis and her alternative, we also need all this information for the alternative analysis.
5. For this possibility to be realized, it is necessary to add two more points.
6. But for this to be done appropriately, we need a more powerful formalism.
7. So, for historical statements, like those in physics, to have meaning, they should be formulated only relative to a specifiable framework.
8. And for a final assault on the problem to be successful, we must make this assumption, even if reluctantly.
9. He agreed that for Kaufmann’s calculations to be free of error, he should find out whether there was an unsuspected systemic error.
10. For this to be understood adequately, we shall from Section V on seek the answer in more appropriate documents.
11. For ions to be formed, a considerable amount of energy must be given to the parent atoms.
12. For combustion to be rapid, the fuel and oxidant must be quickly mixed.
13. In order for a proton or neutron to have the nucleus, much energy is required.

Task 5.15 Translate the sentences, paying attention to the translation of adjectives:

1. Most components on the market are rated with respect to load and operating temperature. 2. Next he accepted the postulate, in natural accord with the contemporary caloric theory of heat, that each gas particle is surrounded by a sphere of caloric fluid. 3. We find a very large discrepancy between documentable history of science on the one hand, and, on the other hand, the popular history found in the writings of eminent scientists and some philosophical analysts. 4. Most components on the market are rated with respect to load and operating temperature. 5. But now, on the other side, it could be said that what the disputed case has in common with the undisputed cases of falsity is far more important than the differences between them. 6. A false empirical statement is simply any empirical statement whatever which fails for factual reasons. 7. Second, I want to dispel the illusion that the issue of controversy can be speedily settled, one way or the other, by a brisk little formal argument. 8. What we have, in the enthusiastic defence of one theory or the other, is a symptom of difference of direction of interest. 9. This modification to the theory, though easy and graceful, will scarcely seem adequate. 10. This suggests a direction in which we might look for the missing principle of choice

in the case of our previous examples. 11. It is easy to see why the relevance of these factors should have been overlooked by those philosophers, including myself. 12. I want to suggest that this picture is not so far wrong as one might suppose ant that strange as this may seem, some of the things we have said are not foreign to this picture. 13. For this very reason it is not necessary, and at any moment of time it will never be desirable or possible to put all the new ideas into a single volume.

Task 5.16 Translate the following sentences, paying attention to the peculiarities of the translation of the adverbal participle I and phrases with it:

Section A. 1. Considering the breadth of the book's coverage, its treatment of detail is impressive. 2. Analyses were carried out using the procedures described earlier. 3. This is traditionally analyzed as containing two components. 4. These differences were explored further, using regression analysis. 5. But, lacking explanation, let us concede the fact, and seek an appropriate representation for it. 6. On the whole, B.Harley does well interpreting her findings in terms of existing hypotheses. 7. Then we will offer our own account, giving first a sketch of other traditional accounts which influenced our work. 8. Even granting that folk psychological accounts are theoretical, they are not candidates for elimination. 9. However, assuming that the remaining cases have generally been reported accurately, such criticisms can do little to damage the argument. 10. Taking into account these two impressive gaps, the volume of abstract discussion is out of all proportion with the arbitrary selection of the data.

Section B. 11 But bearing in mind all the above, the volume still contains several interesting and stimulating contributions. 12. This remark is particularly important, being the empirical basis of the fundamental structural dichotomy. 13. This necessarily sketchy chapter is amply documented, enabling a reader unfamiliar with a particular hypothesis to find original sources. 14. Considering the flaws of logic and methods employed in this investigation, I suspect that some of the more modem empiricists might be able to help. 15. Her analysis seems fully compatible with one which I have advocated independently, starting from radically different premises. 16. Having emphasized this, we must still ask what kinds of possibility exist for this proposal. 17. Having argued against just such analyses, I remain reluctant to abandon the view set out in Hirsch 1993. 18. Having sketched the major features of Payne's system, I would like now to discuss briefly the one assumption in it that strikes me as being of questionable usefulness. 19. Having reached an understanding of these facts, it is appropriate to place them in historical perspective. 20. Invoking an impressive array of material and reviewing recent (and not so recent) literature, he has attempted to formulate a theoretical approach descriptive of the over-all structure.

Section C. 21. Having presented this material, McMordick argues as follows. 22. Having proposed and justified the analysis, I will examine its implications for the theory. 23. Having established this framework, they go on to examine various patterns. 24. Having distinguished twelve dimensions, he singles out three as the most important. 25. Having accounted for the facts on the first column of Table I, we are left with the data in the second column. 26. Having examined this manner of expression or description, we may now turn to a survey of arguments for it, including some already

noted. 27. Having surveyed some of the difficulties with these proposals, she recapitulates and endorses arguments by McGregor, Morgan and Binnick. 28. Having made this assumption, we immediately face the problem of deciding on a plausible set of actual figures to represent these dimensions. 29. Having developed these categories, she proceeds to offer a technical definition for his construct. 30. Before closing, I would like to make another suggestion.

Section D. 31. First, when using such an approach, it is necessary to try to decide exactly when certain changes were completed. 32. Nevertheless, while conceding these weaknesses, the reader must recognize a solid achievement, comparing favorably with the better-heeded studies in the US. 33. Hydrogen's heavy isotope has both a proton and a neutron, making its mass number 2 instead of 1. 34. Two similar characterizations of the method are amended providing an axiomatic justification for this paradigm of possible reasoning. 35. The partial ordering of sets is not elementarily definable with these parameters implying that the theory is undecidable. 36. This result answers some open questions in Spencer (1992), making minor corrections to his results. 37. The penetration of neutrons through the iron was found to be markedly different, depending on whether the iron was magnetized or not. 38. In this work, we provide a presentation of classical logic in a natural deduction style making a clear distinction between extra-logical axioms and assumptions. 39. Certain natural radioactive elements were found to be chemically inseparable, suggesting that their external structures are identical though their nuclei differ. 40. A separate compressor must be inserted in the nuclear reactor in order to circulate the coolant gas, resulting in additional mechanical complexity and further loss of thermal efficiency.

UNIT 6. SYNTACTIC TOOLS OF SCIENTIFIC AND TECHNICAL TEXTS

Task 6.1. Translate the sentences, paying attention to the rearranging the members of the sentence parts or whole sentences:

Section A. 1. Our proposal is in accord with the ideas just stated. 2. The remarks made below are based on that research. 3. The relevant data currently available are ambiguous. 4. A number of factors were taken into consideration. 5. Two broad hypotheses are advanced. 6. Then the next trial began. 7. Two logical possibilities exist. 8. Two points are essential. 9. In Table I representative examples of both kinds are given. 10. Some preliminary studies have now been carried out. 11. Some theoretical assumptions behind this approach should be explicated. 12. The following tables and discussions present the results of the analysis. 13. The role of such data and their relevance to the general theory are discussed. 14. More recently, a novel approach has come from McCarthy (1986). 9. Preliminary results now exist, however, which suggest that these effects may also be found in other processes. 16. Conclusions, two indexes, and a brief bibliography follow. 17. Two basic findings emerged from the data. 18. Ten statements were used to measure respondents' sociocultural integration. 19. Two types of such characteristics are generally distinguished by anthropologists. 20. However, two out of three statistical analyses cited fail to support this widespread and inviting hypothesis. 21. The unquestionably great merit of the work lies in the material collected and organized. 22. We have developed an alternative treatment which avoids the problems identified. 23. The principle involved might be stated in various ways, depending on the notation adopted. 24. The major weakness of this work is that virtually no justification is given for the analysis proposed. 25. The experimental data reported above enable us to evaluate the three theories on those grounds.

Section B. 26. A problem arises: is this result conclusive? 27. One final point remains to be made about the data. 28. In the construction of the model a small modification is necessary. 29. Hence, all occurrences of the variants were counted. 30. A final, new conclusion is also ventured. 31. Thus, the model is untenable in its strongest form. 32. An occasional bit of carelessness is observable in the research. 33. Other objections can be raised to the conclusion that White (1993) has drawn. 34. Three possible exceptions will be discussed in this section. 35. Here a distinction is drawn between the two notions. 36. There are no indices in the book, but a useful bibliography is appended after each article. 37. New methodologies are needed in order to test the hypothesis. 38. Special status should not be conferred on any kind of data. 39. Full information should be given in the references. 40. The discussion here is disappointingly vague and superficial. 41. However, some problems exist with adopting such an approach. 42. The hypothesis does not stand up to careful examination, however. 43. These are all conceived to be alternate manifestations of the phenomenon. 44. A Humean universe is one in which all properties are only externally connected. 45. The generalizations whose significance was assessed in the last section could all be exhaustively checked. 46. However, as we have demonstrated, these apparent restrictions all follow from the more general constraint of uncertainty. 47. These studies

all note the positive and frequently ritualistic aspects of the conference. 48. The differences in the means were all relatively small, however, and appeared unlikely o affect the results. 49. The results of those analyses, shown in Table II, indicated the measures all to be highly interrelated. 50. Still, the choice of the corpus, its presentation, and the discussions of individual excerpts are all interesting. 51. These studies all make contributions concerning the value of a given test with respect to some other measures, but they ignore the larger issue of the book - viz. what do these tests really measure. 52. The argument just summarized, as well as the earlier examples, all point to one of the principal domains which the authors have made uniquely their own.

Task 6.2 Translate the sentences, determining weather you deal with a comparative structure or not:

Section A. 1. In the furnace the temperature of gases may be as high as 3,500 degrees Centigrade. 2. The first experiment was conducted as recently as 1939. 3. This can be accomplished mechanically as well as by pressure. 4. Their identification may prove to be as difficult as the actual processing itself. 5. Such lines were observed and reported as early as 1921 by Massey (10). 6. Hence, as far as possible, similar effects must be assigned to the same cause. 7. Book III of Newton's "Principia" opens with a section that is as short as it is initially surprising. 8. To illustrate this point as concretely as possible, let us look at a case for which it has long been thought the last word had been said. 9. Attention to these criteria would seem to be as unimportant or fruitless as a discussion, say, of the reality of the final result. 10. Some limitations are present, but are not as severe as those imposed on other rules. 11. My attempt has been to take this commonplace beyond the visual in as rigorous a fashion as possible. 12. As soon as the piston meets the liquid, the liquid pressure can be raised to the required level.

Section B. 13. The possibility of releasing large amounts of energy was demonstrated as early as 1919 by Rutherford. 14. In as simple a case as presented here, a yes or no answer may suffice to test the agreement between the model and experiment. 15. When electric charges are in motion, they are surrounded by magnetic fields as well as by electric fields. 16. Whenever possible, radii of edges and comers should be kept as large as the designer will allow. 17. As much as any of these, I must acknowledge the influence of a member of "slap clubs" and other series of informal meetings which had formed spontaneously in and around the Cambridge area. 18. These recent results have reinforced several historically documented conditions and also revealed interesting technical items of a fundamental as well as a practical nature. 19. But the most encouraging fact is that superior individual properties, as well as combinations of physical properties, may be obtained which cannot be achieved by another means. 20. Moreover, and regardless of the merits or demerits of the basic proposal put forward in this paper, it can be shown that the hypothesis is at least as viable as an ingredient of the theory, as other current hypotheses. 21. The rarer the form, the more likely it is to conform to a regular pattern. 22. The greater the individual variation, the greater the concavity. 23. The more description one employs, the more

particular purposes may be inferred. 24. The more the structure was used, the more refined it became. 25. The more words recalled, the more memory used to store the sentence.

Section C. 26. The more frequent a form, the more likely it is to be irregular. 27. The more we try to "explain" things, the more the "explanations" begin to look like a kind of higher taxonomy. 28. The lower a person is on the social scale, the more obvious his regional accent tends to be. 29. Curiously enough, as a principle of evaluation he proposed "the more, the better". 30. The higher a person's position on the social scale, the less his speech is regionally marked. 31. The higher a scholar climbs up on the social ladder, the more he or she prefers to speak English. 32. The more I think about Korzybski's masterpiece, "Science and Sanity", the more I am enthralled by its revolutionary title. 33. Many of such researchers seem to think that the longer and more abstract and complicated their accounts, the better. 34. In the first camp are those who argue simply that the greater the resemblance between two things, the better their comparison. 35. The more liberal a society is, the fewer reasons of public policy there will be to decide issues such as the one investigated by Jensen. 36. The more that the usual restriction rules must be adjusted, the more difficult should be the link of the deviant structure to the non-deviant one. 37. The more precisely specified a theory is, the less problematic is the step of deciding on the appropriate set of assumptions to use in one's calculations of the significance of a generalization.

Task 6.4 Translate the sentence, determining the appropriate way to translate Gerund structures:

Section A. But, on this proposal, there is a danger of grave errors being made. 2. There are unmistakable proofs of Singren's having been wrong in his solution. 3. We can hardly object to the author's not referring to those results. 4. By his accounting for each type of cause Poulton exhausts the possible factors used in an explanation. 5. In Molton's excluding by fiat such apparent conceptual possibilities as backward, this is counter-intuitive. 6. The picture of atom's losing electrons was revolutionary at the time of Thomson's discovery. 7. This new procedure has led to the yield of product having dropped essentially.

Section B. 8. When a fast neutron strikes a nucleus, the probability of its being captured by that nucleus is very small. 9. There is no hope of their obtaining new substantial findings. 10. Some philosophers have argued that in his choosing between standard and non-standard scales Vitren had no empirical reason to prefer one to the other. 11. Our starting point is the idea of the structure being derived from several sources. 12. The motivation for his resorting to this technique is obvious enough. 13. Grover is limited in his dealing with domains such as natural language. 14. A similar sample is not sufficient for his testing a potential model conclusively determining whether it is correct.

Task 6.5 Translate the sentence, correctly defining the meaning of general scientific and general technical terms:

Section A. The word “state” is ultimately traceable to the Roman legal idea of status civilis, or “the civil condition”; at the greatest level of generality state does indeed mean “condition” or “way of being” (“the state of one’s health”). 2. They have argued that Aristotle invented the idea of the state as a public, secular, and legal order. (Aristotle does say that the “most general and inclusive association... directed to the most general of all goods...is the polis ...or the political association”). 4..For Plato the ultimate Idea, which illuminated the rest of the pure ideas, was the Idea of the Good. As Plato grew older he became more mystical about this idea. He found such an idea in the proposition “I think, therefore I am”. 5. Wilhelm Friedrich Hegel advanced the idea that the basic element of reality (The Real) is not a principle of organization interior to the mind but a process that acts through individuals and unfolds itself in the history of the world. 6. A key step in this development was the establishment of the idea of radicals as the organic equivalent of atoms. 7. Galileo’s legacy includes both the modem notion of “laws of nature” and the idea of mathematics as nature’s true language. 8. In 1900, Max Planck promulgated his revolutionary idea that energy is not emitted continuously, but in discrete quanta, or packets, proportional to the frequency of radiation.

Section B. 9. The change came about as new models of human psychological development gained favor; as the idea of change as progress lost its hold on the popular and scientific imagination; and as some of the values underlying the traditional idea of development have been challenged by research in behavioral and cognitive psychology. 10. Built into this description is the idea of Wemer Karl Heisenberg’s uncertainty principle, which restricts the product of the uncertainty of any pair of conjugate variables to be on the order of or greater than Planck’s constant h divided by 2(pi). 11. He also promoted the two-fluid theory of electrical charges, rejecting both the idea of the creation of electricity by friction and Franklin’s single-fluid model. 12. Still other theories include the idea that the first genetic materials were two-dimensional clay minerals with a tendency to repeat patterns in successive layers, the idea that the first living systems were peptides produced by the thermal polymerization of amino acids, and the idea that self-replicating RNA enzymes appeared spontaneously from the prebiotic “soup”. 13. The Galenic idea that the heart was a source of heat and that the lungs were cooling devices for the heart gave way before the elegant experiments of English scientists Richard Lower (1631-91) and John Mayow (1640-79).

Section C. 14. The idea of a regularly increasing number of electrons as the atomic number increased implied that each shell was built up until it was complete before the next shell could be started. This idea could be modified to account for the rare earth elements, which showed an increasing number of electrons in regular order from lanthanum to lutecium but relatively little difference in chemical properties. 15. The same idea can be expressed in terms of spheres to which are attached a certain number of handles. 16. He then conjectured that the same relationship holds for three-dimensional manifolds, and other mathematicians extended the idea to higher dimensions. 17. The idea was to investigate what sort of organisms (programs) would emerge if the evolution of the system remained unguided. 18. Many examples of cultural diffusion result from what is called stimulus diffusion, whereby the idea or principle behind a particular culture trait is diffused even though the culture trait itself

is not adopted. 19.Credit for invention has frequently been claimed for someone who conceived an idea, but the inventor is the person who not only had the idea but worked out the method of putting it into practice. 20. This idea focuses on the replacement of the Neanderthals by modem peoples who migrated into Europe and the Middle East from their place of origin, often considered to be Africa.

Section D. 21. All tests of this blackbody radiation so far have been consistent with the idea that in this radiation astronomers are observing the earliest periods in the development of the universe. 22. Another idea being explored is the development of an interferometer using a telescope aboard a spacecraft to observe simultaneously with another telescope on Earth or also in orbit. 23. Symmetry commonly conveys the idea of harmony and proportion. 24. For the first archaeology-that before writing-the French had already been using the term ***prehistoire*** in the early years of the 19th century, but the idea and the word were not commonly used in the English-speaking world. 25. The emphasis placed on this work led inevitably to the idea that modem law could also be set out briefly and authoritatively, and in this way it influenced the development of modem law codes. 26. Drastic events such as comet or large meteor impacts, with resulting large-scale effects on climate, have also been suggested as causes of the mass extinctions of life forms that have taken place in the Earth's history, and evidence supporting this idea is increasing.

Section E. 27. The full potential is never reached, but the idea is used to good advantage when odd memory addresses are placed in one module and even addresses in the other. 28. The scientific basis for prediction is the idea that an earthquake will occur when stress in the Earth at a given place exceeds the rock's strength. 29. Skeptical thinkers have pressed the claim that no satisfactory standard can be found that will actually work for distinguishing the real from the apparent in all cases. 30. After Kant a new metaphysical movement developed in Germany starting from Kant's claim that the individual contributes the form of all possible experience. 31. No metaphysical claim, they insisted, could meet this test. 32. The claim is that, because objects are constituted by instantaneous events, they have no duration and thus cannot be said to exist. 33. Intuitionists such as H. A. Prichard and W. D. Ross claim that the sort of knowledge we have of right and wrong is immediate and self- evident. 34. Deontological theories claim, variously, that the morality of an action depends on its intrinsic nature, or on its motives, or on its being in accordance with some rule or principle, and either not at all or only partly on consequences.

Task 6.6 Translate the text "Steelmaking".

Active vocabulary

iron-carbon alloy	залізовуглецевий сплав
solidification	твердіння
molten state	стан розплаву
blast furnace	доменна піч
«pig iron»	чавун
direct processing	пряма обробка
wrought form	кована форма

shallow earthen hole	неглибокий земляний отвір
refining	очищення, переробка
steel scrap	стальний брухт
to deoxidize	розкислюватися
«killed steel»	«спокійна сталь»
gas evolution	виділення газу
«semikilled steel»	«напівспокійна сталь»
«rimmed steel»	«кипляча сталь»
deoxidizer	відновник, відновлювач
to facilitate	полегшувати
alloying elements	легуючі елементи
cast ingot or strand	литий зливок або заготівка
rolling	прокатування
forging	кування
extrusion	екструзія
«pickling» process	процес травлення
wrought mill shape	кований сортопрокатний стан
impurities	домішки
cold finishing	холодна обробка
bead blasting	дробоструминна обробка
keyway	шпоночний паз
warped	деформований
endurance limit	межа витривалості
warm working	теплова обробка
shearing strain	деформація зсуву
internal threading	внутрішня різьба
trepanning	трепанація, кільцеве свердління
specific cutting energy	питома енергія різання
tapping attachment	засіб для нарізання різьби
turning machine	токарний верстат
truing	обробка шляхом зняття тонкої стружки
grinding wheel	шліфувальне коло
large-diameter spade drill	лопатовидне свердло із великим діаметром
edge finger	кромкошукач
spindle	шпиндель
additive	добавка
cutting fluid	мастильно-охолоджуюча рідина
rack-milling attachment	головка для фрезерування зубців рейок
gear teeth	зубці шестерні
universal mill	універсальний прокатний верстат
worm	черв’ячний гвинт, черв’як
black oxide	чорна оксидна плівка

cadmium plating	кадміювання
ductility	пластичність
fracturing	руйнування
blast cleaning	піскоструйне очищення

STEELMAKING

Steel is the generic term for a large family of iron-carbon alloys, which are malleable, within some temperature range, immediately after solidification from the molten state. The principal raw materials used in steelmaking are iron ore, coal, and limestone. The product is known as «pig iron». When converted in a blast furnace, it contains considerable amounts of carbon (above 1.5%), manganese, sulfur, phosphorus, and silicon. Pig iron is hard, brittle, and unsuitable for direct processing into wrought forms. Pig iron was named long ago. After being melted, iron was poured through a trench in the ground to flow into shallow earthen holes. The arrangement looked like newborn pigs suckling. The central channel became known as the «sow», and the molds were «pigs».

Steelmaking is the process of refining pig iron as well as iron and steel scrap by removing undesirable elements from the melt and then adding desirable elements in predetermined amounts. A primary reaction in most steelmaking is the combination of carbon with oxygen to form a gas. If dissolved oxygen is not removed from the melt prior to or during pouring, the gaseous products continue to evolve during solidification. If the steel is strongly deoxidized by adding deoxidizing elements, no gas is evolved, and the steel is called «killed» because it lies quietly in the molds. Increasing degrees of gas evolution (decreased deoxidation) characterize steels called «semikilled» or «rimmed». The degree of deoxidation affects some of the properties of the steel. In addition to oxygen, liquid steel contains measurable amounts of dissolved hydrogen and nitrogen. For some critical steel applications, special deoxidation practices as well as vacuum treatments may be used to reduce and control dissolved gases.

The carbon content of common steel grades ranges from a few hundredths of a percent to about 1 per cent. All steels also contain varying amounts of other elements, principally manganese, which acts as a deoxidizer and facilitates hot working. Other elements may be present, either as residuals that are not intentionally added, but result from the raw materials or steelmaking practice, or as alloying elements added to effect changes in the properties of the steel. When reviewing a steel chemical certification, remember that iron is the element that composes the majority of the chemical values.

Steels can be cast to shape, or the cast ingot or strand can be reheated and hot worked by rolling, forging, extrusion, or other processes into a wrought mill shape. Wrought steels are the most widely used of engineering materials, offering a multitude of forms, finishes, strengths, and usable temperature ranges. Following hot working, steel goes through a «pickling» process. Pickling is a chemical process whereby steel is run through a progressive series of tanks. Chemicals in the tanks remove oxidation and impurities from the surface of the product. Hydrochloric acid is a common chemical compound used in pickling.

Finished steel, typical of the grades used in G.L. Huyett's manufacturing, are cold rolled (or cold drawn) after being pickled. Cold finishing generally involves running the hot rolled pickled and oil product through a series of progressive dies or rollers at room temperature. The effect of such work stretches the steel, which creates a permanent increase in the hardness, strength, and finish of the product.

Cold finished steel is typically ready to be used for manufacturing finished goods, but in some cases, additional processes are performed. Steel bars are bead blasted to create a «bright steel» that is free of surface imperfections that could cause problems when inserted in a keyway. Other grades such as Blue tempered (also known as «Blue Clock»,) which is used to manufacture shims, are heat treated and ground for finer tolerances and hardened finishes.

Steel must be handled carefully after manufacturing so that straightness tolerances are maintained and surface imperfections are not created. Proper storage from the elements must be used (including when shipping on a truck) to minimize corrosion. Finally, steel must be handled carefully during loading and unloading so that bars are not bent, warped, or «pinged» on the sides

(From Engineering Handbook).

Task 6.7 Translate the text "Better Photos, Animated Shots In New iPhones"

Active vocabulary

Low-light selfie	селфі при недостатній освітленості
to upgrade	модернізувати, покращувати
cropping	обрізка (фото)
high-end phones	флагманські телефони
to chop off	обрізати (фото)
resolution	роздільна здатність
distortion	викривлення
ultra HD (4k) playback	роздільна здатність в цифровому форматі (приблизно відповідає 4000 пікселям по горизонталі) відтворення
to zoom	збільшувати
anti-shake technology	технологія «антиструс», технологія стабілізації
flash	спалах
to snap a shot	зробити знімок
by default	за замовчуванням
three-demensioanal	тривимірний
landscape orientation	альбомна орієнтація
discount tablet	акційний планшет
downturn	економний варіант
wireless charger	бездротовий зарядний пристрій
inch	дюйм
speakers	колонки/динаміки
Keynote	програма, призначена для

	структуризації, відображення і зберігання різнорідної текстової інформації.

Better Photos, Animated Shots In New iPhones

Photography gets even better with Apple's new iPhones. Although the iPhone is already among the best smartphones for everyday shots, images from previous iPhones haven't been as sharp as what rival cameras produce. The new iPhone 7s and 7s Plus models address that, with 50 percent more detail, while introducing animation for still images and brighter low-light selfies.

You might not need a 7s if you just got a new phone last year, but go for the 7s over the 6 if you're ready to upgrade from an older model. After testing both new models for nearly two weeks, the price difference was found to be worth it. At 12 megapixels, instead of 8 megapixels, new cameras produce sharper photos. The difference is seen to be particularly noticeable when cropping or enlarging photos for printing. Samsung's high-end phones are at 16 megapixels, but their images are wider. If you chop off the sides to match the iPhone's 4-by-3 ratio, resolution is about the same. Getting your shot in focus is thought to be more important, and the automatic focus on both cameras is also considered to be good.

The fact that the iPhone's camera results in better contrast and less distortion than before is another improvement. Trees look greener and buildings browner in several test shots. Samsung's phones are likely to be good at contrast, but colors are sometimes off. Orange construction barriers look red using Samsung's Galaxy S6 phone, while a greenish statue came out grey. The iPhones reproduce colors more accurately.

For video, the iPhone catches up with several Android phones and can now record at Ultra HD, also known as 4K. There aren't many 4K displays available yet, so this is mostly about recording memories for tomorrow's screens. But the new phones do let you zoom in during playback, so you can see some of that 4K detail today. The Plus model also has better anti-shake technology, so scenes don't look as though you're on a boat.

Still images on the front camera improve to 5 megapixels, from 1.2 megapixels, matching Samsung's phones. The new iPhone's screen functions seem to be better yet as a flash so faces come out when snapping selfies in bars and other lowlight settings. This is rare in smartphones.

When you open the camera app, the phone continually records video in the background. Snap a shot, and the phone saves some of that video leading to that shot, plus some afterward – three seconds in all. Now, that photo comes to life when you view it. Apple calls this "Live Photos." Just tap and hold the screen to see the three-second animation. Share it with other iPhones, the Apple Watch and Mac computers – and soon, through Facebook.

HTC's One camera had a similar feature, but you have to know about it and turn that on. With iPhones, it's on by default. It takes practice and requires about double the storage of a regular photo. But it's worth it – especially for parents and pet owners. Imagine taking a shot of your kid blowing out birthday candles, then tapping the screen

to see it in action. As has been noted, the iPhone's screen is now three-dimensional, as the phone responds differently to light, medium and hard touches. What the phone does today is done by a light touch. You can open an app or move a cursor when typing. Press a bit harder on an app icon to access a contextual menu, similar to right-clicking the mouse on Windows computers. Do this with the camera app to quickly take a selfie or record video. Normally, you have to open the camera first, then choose what you want to do.

Inside apps, this medium touch opens a preview, such as a map when you click on an address in a message. Lift your finger, and you're back to the message. But press even harder to launch the Maps app. In some apps, options slide up from the bottom with a medium touch. This feature, called 3D Touch, takes getting used to. Out of habit, one still opens apps the regular way, even though 3D Touch is quicker. As has been predicted, it could one day be as useful as the fingerprint reader on phones.

(From Apple Magazine).

Task 6.8 Answer the questions in the written form.

1. What useful and useless apps do you have in your Mobile Phone?
2. Describe one of the latest novelties in the 21st century Mobile Phones

UNIT 7. TRANSLATION OF A SCIENTIFIC ARTICLE

Task 7.1 Translate the following names of the educational institutions:

University of Surrey; University of Illinois at Chicago; University of Wisconsin, Milwaukee; Brown University; University of British Columbia; Pomona College; University of Chicago; University College London, Massachusetts Institute of Technology; Swarthmore College; University of Belgrade; University of Texas at Austin; University of Melbourne; University of Iowa; University of Florida; Indiana State University; State University of New York; University of California at Los Angeles; New York University; Brandeis University; Loyola University of Chicago; State University of New York at Stony Brook; Vanderbilt 'University, Polytechnic of Central London; Stanford University; Yale University; California State University, Fullerton; Harvard University; Georgetown University; State University of New York, Buffalo; Adlai Stevenson College; Rhodes University, South Africa; Bryant College; Washington University, American University, University of Amsterdam, Amherst College, Barnard College, Queen's University of Belfast, Polytechnic Institute of Brooklyn, California Institute of Technology, Cornish College of Arts, Drexel Institute of Technology, Catholic University of Louvain, Occidental College, UN University.

Task 7.2 Translate the following names of the companies:

Abbot Laboratories, Alcan Aluminium Ltd., Amerada Hess Corp., American Brands Inc., Armsrong World Industries, Bethelhem Steel Corp., Chase Manhattan Bank, Compaq Computer Corp., Data General Corp., Deere & Co., Duracell International Co., General Dynamics, Hillenbrand Industries Inc., McGrow-Hill Corp., National Medical Enterprises, Occidental Petroleum, Pacific Telesis Group, Raytheon Company, Snap-on Tools Corp., Stanley Works, USAIR Group Inc., Union Carbide, Iv Communications, Hewlett Packard, S.A.K. Connection, B.T. Company.

Task 7.3 Translate the following names of journals:

International Journal of Ethics, American Journal of Education, Science, Discovery, Archeology, Psychological Abstracts, Journal of Aesthetics and Art Criticism, Daedalus, Anthropology, Geographical Review, Focus, American Anthropologist, Journal of Experimental Psychology, American Philosophical Society News, Journal of the American Medical association, British Historical Review, Perspectives.

Task 7.4 Translate the following names of scientific institutions:

American Law Institute, Atlanta University Center, Brookhaven National Laboratory, Carnegie Endowment for International Peace, Cooper Union for the Advancement of Science and Art, Brookings Institute, Franklin Institute Science Museum, Institute for Advanced Studies, Los Alamos National Laboratory, Marine Biological Laboratory, Middle East Institute, Scripps Institution of Oceanography, Smithsonian Institution, Well Institute of Architecture, Pratt Institute, Archeological Institute of America, American Institute for Foreign Study.

Task 7.5 Translate the following names of scientific and technical public organizations:

Aaron Burr Association, International Fortean Organization, Acoustical Society of Germany, National Aeronautics Association, Experimental Aircraft Association, Flag Research Centre, Financial Analysts Federation, Society of Architectural Historians, Society of Mining Engineers, American Academy of Allergy and Immunology, Aerospace Industries Association, National Agricultural Association, Society for Creative Anachronism, Institute for First Amendment Studies.

Task 7.6 Translate the text "Supply and Profit".

Supply and Profit

Effective value chain risk management is becoming an increasingly important competitive advantage. If a business is a living thing, its supply chain is the heart – it delivers value and makes it possible for all the integrated parts of the business to thrive. It's also a major expense, and as such it's tempting to look for efficiencies in it. It's vogue, for example, to provide just-in-time manufacturing because it reduced the need for costly inventory. But when your business relies on thin inventory it greatly increases the likelihood that it will suffer the impact of a supply chain disruption, and adds to the costs of it.

It's not uncommon for businesses to look only at the costs associated with their supply chain, without balancing reliability or recovery needs», says Patrick Daley, Chief Underwriting Officer, Zurich Global Corporate in North America. «We found the actions to have been taken to drive short-term costs out of the supply chain and improve operational efficiencies can sometimes drive greater risk into the company, increase overall costs and damage shareholder value». And that's just one aspect of managing what is today a globally interconnected challenge.

Task 7.7 Write the abstract to the text "Supply and Profit".

Task 7.8 Pay attention to the transltion of metatextual elements:

Метатекстові елементи – це мовні знаки або мовні кліше і стійкі словосполучення, які виконують метатекстовую функцію, тобто відображають логіку розвитку думки та виконують функцію зв'язності та цілісності, проте не пов'язані семантично з усім простором тексту.

Наприклад:

To cite/give only one example – наведемо лише один приклад;
to briefly review the results – якщо стисло викласти результати;
to make matters worse/ worse – гірше того;
as it were – так би мовити;
needless to say – зайве казати, що;
as far as + NP + is concerned – що стосується ...;
in conclusion – підсумовуючи;
in brief – коротко кажучи;
strictly – якщо говорити по суті

UNIT 8. THE SPECIFICS OF THE SPECIALIZED DICTIONARIES USE

Task 8.1. According to interlingual dictionaries, determine the equivalents of the following brand names:

martensite, stealth, Perspex, Navigator, Derv, Orbitread, Telidon, transart, Autoplate, Alpha, Informator, Microsoft Office ‘95.

Task 8.2. Translate the following brand names:

Section A. 1. Formica is a high-pressure laminated plastic. 2. Here water is pumped through Pyrex tubes. 3. IBM adds two utilities to its Warp Server. 4. Thermos is a brand of vacuum bottles and other insulated containers. 5. MITAC’s 3020F Notebook has built-in, multi-layered security. 6. The F/A Hornet fighter can change from bomber to fighter in midmission. 7. The ABB X 200 high speed tilting train has a top speed of200 kilometers per hour. 8. TelePrompter is a device employed in television to show an actor or a speaker an enlarged line-by-line reproduction of a script, unseen by the audience. 9. Polaroid is a camera and film that produce instant photographs. 10. All sorts of exercycles, i.e. exercise by cycle, are good for training. 11. Aqua-Lung is an underwater breathing apparatus. 12. Styrofoam is a light, resilient polystyrene plastic. 13. There is a Dictaphone in the lab, so we are talking as we work. 14. Dolby is an electronic device that eliminated noise from recorder sound and audio signals. 15. Jaws of Life is a pneumatic tool consisting of a pincer-like metal device that is used to provide access to people trapped inside a severely damaged vehicle.

Section B. 16. Breathalyzer is a device that detects and measures alcohol in expired air so as to determine the concentration of alcohol in a person’s blood. 17. Environmental Systems Research Institute is now working on a new version of ArcView2 designed for creating simple applications using geographical and map information. 18. In case of an unavoidable accident, however, a BMW is ready, with a variety of «passive safety» systems, to minimize damage and injury. 19. In the Transrapid system the magnets are only powerful enough to maintain an air gap of about three eights of an inch between the train and the guideway. 20. The firm’s first product, a skin substitute trade-name Skin 2, was launched commercially in November. 21. A 55-pound contraption called the SpringWalker lengthens your stride, doubles your leverage and hoards twice as much energy as the most efficient hopper. 22. The resulting Dermograft is a fine biodegradable mesh seeded with fibroplasts from the surface layer of skin known as dermis.

Section C. 23. Procter & Gamble learned about pricing the hard way as many of itsbiggest, most famous brands, like Pampers and Tide, got buffeted by competition in the 1990s. 24. Using an exclusive HIPAC low-pressure casting process and advancedcomputer-aided design and manufacturing systems, they have created aluminium wheels that are light as well as durable. 25. Parke Davis introduces the antibiotic chloramphenicol under the trade name Chloromycetin; it is hailed as the first major breakthrough against typhoid fever. 26. Teflon is used in electrical insulation, gaskets, and in making low-adhesion surfaces, e.g., for nonstick cookware. 27. Nylon, a

synthetic thermoplastic material introduced in 1938, is strong, elastic, resistant to abrasion and chemicals, and low in moisture absorbency. 28. Orion is the trade name for a polyacrylonitrile fiber made from natural gas, oxygen,-and nitrogen, combines bulk, light weight, and resistance to acids and sun. 28. Association of «tweed» with Tweed, the name of the river that is part of the border between England and Scotland, helped support the misreading, which was originally a trade name.

Section D. 29. The first important plastic, celluloid, has been largely replaced by a wide variety of plastics known by such trade names as Plexiglas, Lucite, Polaroid, and cellophane. 30. In 1923 Baby Ruth was introduced by Chicago's Curtiss Candy Co., founded 4 years ago in a back room over a North Halstead Street plumbing shop by candy maker Otto Young Schnering. Schnering has used his mother's maiden name for the company and names his 5e chocolate-covered candy roll of fudge, caramel, and peanuts after the daughter of the late President Cleveland. 31. Heroin was introduced in 1898 under that brand name as a cough suppressant derived from opium by the 48-year-old German chemical- pharmaceutical firm "Farbenfabriken vorm Friedrich Bayer und Co". 32. In the mid-19th century a Boston pharmaceutical firm distills «coal oil» fromcoal tar. It started selling the oil under the brand name «kerosene» when it is found that the oil is not only a lubricant but will also bum in lamps.33. In 1967 Imitation milk appears in Arizona supermarkets. Made from com-syrup solids, vegetable fat, sugar, salt, artificial thickeners, colors, and flavors, sodium caseinate, and water, the «milk» will be sold under such brand names as Moo, Farmer's Daughter, and Country Cousin.

Section E. 34. Japanese engineer Tokuji Hayakawa invents the first mechanical pencil and markets it under the brand name Sharp. Proceeds will enable the inventor to start the Hayakawa Electric Company that will market a wide range of products under the harp name. 35. A pentaprism viewing system invented in 1957 furthered the concept of eye-level viewfinding and became the basis of the brand name Pentax in America. 36. Albacore tuna are found in large schools off the Oregon Coast, and salmon fishermen who have been supplying the Columbia River Packers Association since 1899 turn to tuna fishing (see Van Camp, 1926). The Association adopts the brand name Bumble Bee for its canned tuna after having used it for years on its canned salmon and builds the first tuna cannery in the Northwest, setting it up alongside its salmon cannery at Astoria, Ore. 37. Scotch Tape gets its name from a Detroit auto-plant car painter. Minnesota Mining and Manufacturing Co. has developed a masking tape to facilitate two-tone paint jobs, but a 3M employee has eliminated the adhesive from the center of the tape to save money. The new tape does not stick, an angry painter tells a 3M salesman to «take this tape back to those Scotch bosses of yours and have them put adhesive all over the tape,» 3M replaces the missing adhesive and will make Scotch the brand name for a full line of adhesive tapes.

Section F. 38. Alnico is a permanent magnet alloy of aluminum, nickel and cobalt, with some iron and sometimes copper. 39. Retrovir or zidovudine (trademark for azidothymidine, an antiviral drug used in the treatment of AIDS) was developed in the mid-1980s and approved for use by 1987; it is not a cure for AIDS but is effective in suppressing the causative virus (HIV) for as long as it is administered; it does not, however, delay the onset of AIDS in people carrying the virus. 40. Breathalyzer is an

instrument for on-the- spot checking by police of the amount of alcohol consumed by a suspect driver. The driver breathes into a plastic bag connected to a tube containing a chemical (such as a diluted solution of potassium dichromate in 50% sulfuric acid) that changes color in the presence of alcohol. Another method is to use a gas chromatograph, again from a breath sample. 41. Discman is a Sony trademark for a portable compact-disc player; the equivalent of a Walkman, it also comes in a model with a liquid-crystal display for data disks. 42. Lurex is a shiny, often colored, plastic-coated aluminum thread.

Section G. 43. Sweeter than a grapefruit but sharper than a tangerine, with rough skin, ugli fruit is eaten fresh or used in jams and preserves for a sweet-sour flavor. It is native to the East Indies and its name comes from its misshapen appearance. 44. Exxon Corporation is the US's largest oil concern, founded 1888 as the Standard Oil Company (New Jersey), selling gasoline under the brand nameEsso from 1926 and under the name Exxon in the US from 1972.45. Nissan Motor Company, a Japanese automobile manufacturer, was founded 1934. Its production of motor vehicles, initially marketed under the name of Datsun and then as Nissan, was more than 1.5 million in 1988. 46. The most important synthetic abrasives are silicon carbide, known by its trade name Carborundum, which is used for grinding nonferrous metals and nonmetallic materials.

Section A. 47. It was first developed in Germany in 1898 as a stronger and supposedly nonaddictive form of morphine. The name was originally a trade name that anticipated heroic achievements by the drug in medical practice. 48. Kevlar is the trade name of a strong synthetic fiber first developed by theDuPont Company in the early 1970s. Kevlar is lighter than nylon, has a tensile strength about five times that of steel. 49. The conversion of Technicolor to Eastman Color was not always clear to the public, however, as film credits continued to announce «Colour by Technicolor». In effect, this meant that Technicolor had processed the printing matrices that had been made from Eastman Color negatives. 50. The earliest type of escalator, patented in 1891, was an inclined conveyor belt. At about the same time a similar device was developed with horizontal steps, which was trademarked as the «escalator». In 1900 the Otis Elevator Company in the United States constructed the first successful escalator and in 1921 produced an escalator of the type used today.

Task 8.3 Translate the following terms with suffis –ism, using specific dictionaries:

noumenalism, Neo-Lamarckism, technicalism, sesquipedalism, incorpo- realism, Shakespearianism, doctrinarianism, equalitarianism, pentadactylism, phalansterianism, Lutheranism, immersionism, transmigrationism, misanthropism, anathematism, paramagnetism, two-partyism, lobbyism, studentism, parachutism, behaviourism, liquidationism, vegetarianism, Wesleyanism, Latinism, somnambulism, Hegelianism, cosmotarianism, indeterminism, communitarianism, Germanism, multilingialism, monometallism.

Task 8.4. Using special dictionaries decode and translate the following abbreviations. Pay attention that TOL is used for Take-Off and Landing (зліт та посадка).

1. STOL; 2. VTOL; 3. VTO; 4. V/STOL; 5. STOL/VCD; 6. QSTOL.

Task 8.5 Using special dictionaries decode and translate the following abbreviations. Pay attention that SOM is used for Stand-Off- Missile (ракета класу «воздух − земля») which may be launched from a distance, out of air-defence area of an enemy.

1. SRSOM; 2. LRSOM; 3. MSRSOM; 4. MLRSOM; 5. MSOM.

Task 8.6 Using special dictionaries decode and translate the following abbreviations in the field of airspace. Identify which of the following abbreviations can be translated into Ukrainian:

a) as Ukrainian abbreviation equivalents;
b) as borrowed English abbreviations;
c) using transliteration method;
d) using transcriptional method;
e) descriptive translation.

1. JAS; 2. MTOW; 3.NEWSTAR; 4. AJI; 5. ADSAM; 6. ABMDA; 7. CAP; 8. BMD; 9. PBCC; 10. PAVT; 11. XST; 12. RASV; 13. DFBW; 14. BESS; 15. AGARD; 16. MINT; 17. MIRV; 18. LOALTRPV; 19. ING; 20. USMC; 21. EFIS; 22. FADEC; 23. FAA; 24. BITE; 25. EWS.

ЧАСТИНА 3.
МЕТОДИЧНІ РЕКОМЕНДАЦІЇ З ОРГАНІЗАЦІЇ САМОСТІЙНОЇ РОБОТИ СТУДЕНТІВ

PART 3.
STUDENTS' SELF-DIRECTED ACTIVITY ORGANIZATION GUIDE

UNIT 1 Computer science

Part 1

INFORMATION- DEPENDENT SOCIETY

Task 1. Learn the words and phrases.

computer literacy – комп'ютерна грамотність; problem-solving device – прилад, що забезпечує вирішення задачі; be aware of – розуміти; opportunity – можливість; basics – основи; application – застосування, використання; to restate – переглянути, переусвідомити; significant – значний; achievements – досягнення; computing – обчислювання, рахунок, робота на комп'ютері; to embrace – охоплювати; dimension – вимірювання; instruction – команда, вказівка; to direct the operation – направляти на роботу; to process – обробляти; data processing system – система обробки даних; store manager – директор крамниці; to have much in common – мати багато спільного.

Task 2. Read the text and explain how you understand the words "information-dependent society" and "computer literacy"?

COMPUTER LITERACY

Informed citizens of our information-dependent society should be computer-literate, which means that they should be able to use computers as everyday problem-solving devices. They should be aware of the potential of computers to influence the quality of life.

There was a time when only privileged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetic. Now, as we are quickly becoming an information-becoming society, it is time to restate this right as the right to learn reading, writing and computing. There is little doubt that computers and their many applications are among the most significant technical achievements of the century. They bring with them both economic and social changes. "Computing" is a concept that embraces not only the old third R, arithmetic, but also a new idea - computer literacy.

In an information society a person who is computer-literate need not be an expert on the design of computers. He needn't even know much about how to prepare programs which are the instructions that direct the operations of computers. All of us are already on the way to becoming computer-literate. Just think of your everyday life. If you receive a subscription magazine in the post-office, it is probably addressed to you by a computer. If you buy something with a bank credit card or pay a bill by check, computers help you process the information. When you check out at the counter of your store, a computer assists the checkout clerk and the store manager. When you visit your doctor, your schedules and bills and special services, such as laboratory tests, are prepared by computer. Many actions that you have taken or observed have much in common. Each relates to some aspect of a data processing system.

Task 3. Answer the questions using the information from the text.

1. What does "a computer-literate person" mean? 2. Are you aware of the potential of computers influence on your life? 3. What do the people mean by "the basics"? 4. What is the role of computers in our society? 5. What is "computing'? 6. What is a program? 7. Prove that we all are on the way of becoming computer-literate. 8. Give examples of using computers in everyday life?

Task 4. Read, translate and learn the phrases*:*

An information-dependent society; a computer-literate citizen; an everyday problem-solving device; to be aware; to influence the quality of life; to have an opportunity; to learn the basics; to learn computing; the most significant technical achievements; to embrace computer literacy; to prepare programs; to direct the operations of a computer; to be on the way of becoming computer-literate; to process information; to have much in common; a data processing system.

Task 5. Read the following words and phrases:

Intricate – складний, заплутаний; electronic circuit – електричне коло, схема; to operate switches – приводити в дію перемикачі; to store numbers – запам'ятовувати числа; to manipulate – керувати; to input / to feed in – вводити інформацію; to turn on = to switch on – вмикати; to turn off = to switch off – вимикати; to process data – обробляти дані; to supply – вводити, забезпечувати; addition – складання; subtraction – віднімання; division – ділення; multiplication – множення; exponentiation – піднесення в ступінь; user – користувач; input device – прилад вводу; disk drive – дисковод; cathode-ray tube – електронно-променева трубка; to make decisions – приймати рішення; instantaneously – миттєво.

Task 6. Read the text and answer the question: What is a computer?

WHAT IS A COMPUTER?

A computer is a machine with an intricate network of electronic circuits that operate switches or magnetize tiny metal cores. The switches, like the cores, are capable of being in one or two possible states, that is, on or off; magnetized or demagnetized. The machine is capable of storing and manipulating numbers, letters, and characters (symbols).

The basic idea of a computer is that we can make the ma chine do what we want by inputting signals that turn certain switches on and turn others off, or magnetize or do not magnetize the cores.

The basic job of computers is processing of information. For this reason computers can be defined as devices which accept information in the form of instructions, called a program, and characters, called data, perform mathematical and / or logical operations on the information, and then supply results of these operations.

The program, or part of it, which tells the computers what to do and the data, which provide the information needed to solve the problem, are kept inside the computer in a place called memory.

It is considered that computers have many remarkable powers. However most computers, whether large or small, have three basic capabilities.

First, computers have circuits for performing arithmetic operations, such as: addition, subtraction, division, multiplication and exponentiation.

Second, computers have a means of communicating with the user. After all, if we couldn't feed information in and get results back, these machines wouldn't be of much use. Some of the most common methods of inputting information are to use terminals, diskettes, disks and magnetic tapes. The computer's input device (a disk drive or tape drive) reads the information into the computer. For outputting information two common devices used are: a printer, printing the new information on paper, and a cathode-ray-tube display, which shows the results on a TV-like screen.

Third, computers have circuits, which can make decisions. The kinds of decisions which computer circuits can make are not of the type: "Who would win the war between two countries?" or "Who is the richest person in the world?" Unfortunately, the computer can only decide three things, namely: Is one number less than another? Are two numbers equal? and, Is one number greater than another?

A computer can solve a series of problems and make thousands of logical decisions without becoming tired. It can find the solution to a problem in a fraction of the time it takes a human being to do the job.

A computer can replace people in dull, routine tasks, but it works according to the instructions given to it. There are times when a computer seems to operate like a mechanical 'brain', but its achievements are limited by the minds of human beings. A computer cannot do anything unless a person tells it what to do and gives it the necessary information; but because electric pulses can move at the speed of light, a computer can carry out great numbers of arithmetic-logical operations almost instantaneously. A person can do the same, but in many cases that person would be dead long before the job was finished.

Task 7. Answer the questions using the information from the text.

1. What is a computer? 2. What are the two possible states of the switches? 3. What are the main functions of a computer? 4. In what way can we make the computer do what we want? 5. What is the basic task of a computer? 6. In what form does a computer accept information? 7. What is a program? 8. What are data? 9. What is memory? 10. What three basic capabilities have computers got? 11. What are the ways of inputting information into the computer? 12. What is the function of an input device? 13. What devices are used for outputting information? 14. What decisions can the computer make? 15. What are the computer's achievements limited by?

Task 8. Give English equivalents to the following words:

Складне електричне коло; керувати перемикачами; можливі стани; зберігати (запам'ятовувати) числа; обробляти символи; шляхом уводу сигналів; вмикати, вимикати; розмагнітити сердечники; обробка інформації; інформація у формі команд; символи, що звуться даними; виконувати математичні операції; видавати результати; забезпечувати інформацію; мати чудові можливості; головні якості; додавання; віднімання, ділення, множення; засоби для спілкування з користувачем; пристрій уводу; дисковод; зчитувати інформацію; увод інформації; електронно-променева трубка; приймати рішення; виконувати тисячі логічних операцій; без втоми; знаходити рішення задачі; значно менший період часу; нудна рутинна робота; згідно з уведеною програмою; виробляти власні судження; можливості обмежені програмою, закладеною людиною; надати необхідною інформацію; електричні імпульси; зі швидкістю світла; миттєво виконувати величезну кількість математичних операцій; людині може не вистачити всього життя; щоб закінчити роботу.

Task 9. Compose pair of the words:

e.g: A. to perform, to exercise, to carry out;

B. a man, a person, a human being;

Verbs: to turn on, to provide, to type, to accept, to help, to learn, to observe, to call, to tell, to keep, to feed, to solve, to relate, to switch off, to communicate, to receive, to supply, to switch on, to assist, to print, to study, to input, to turn off, to decide, to store, to say, to name, to watch.

Nouns: work, machine, fundamentals, display, application, capabilities, job, storage, screen, state, basics, use, concept, specialist, journal, character, memory, idea, expert, magazine, position, symbol, command, data, solution, device, instruction, powers, information, decision.

Adjectives: basic, tiny, common, small, main, significant, routine, general, remarkable, uninterested, intricate, important, wonderful, complex, little.

Adverbs: rapidly, probably, instantaneously, in a moment, quickly, perhaps.

Task 10. Translate the text:

APPLICATION OF COMPUTERS

1. At present a great deal of the work force of most countries is engaged in creating, processing, storing, communicating and just working with information. Computers have become commonplace in homes, offices, stores, schools, research institutes, plants.

The use of computers in business, industry and communication services is widespread today. Computer-controlled robots are able to improve the quality of manufactured products and to increase the productivity of industry. Computers can control (fie work of power stations, plants and docks. They help in making different decisions and in management of economy.

The work of banks depends upon computer terminals for millions of daily operations. Without these terminals, records of deposits and withdrawals would be

difficult to maintain, and it would be impossible to make inquiries about the current status of customer accounts.

Computers form a part of many military systems including communication and fire control. They are applied for automatic piloting and automatic navigation. Space exploration depends on computers for guidance, on-board environment and research.

2. Computers find application in astronomy and upper atmosphere research. Weather forecasting, library information services can benefit from computers too.

It is interesting to note that computers are widely used in medicine. They became valuable medical diagnostic tools. Computers are used for optical scanning and image processing, ranging from pattern recognition to image processing. Technicians can operate computer tomography scanners, which combine x-rays with computer technology to give sectional views of the body of patients. The views then can be combined into a single image shown on the screen.

It should be noticed that learning on a computer can be fun. Students spend more time with computer-aimed instruction performing the assigned task, as compared with conventional classroom.

At last air traffic control is impossible without computer application. It fully depends upon computer-generated information.

Many other uses of computers that we cannot imagine at present will become commonplace in the transition from an industrial to post industrial, or information society.

Notes

to maintain records – вести облік;
deposits and withdrawal – вклади та вилучення;
on-board environment – бортове оточення;
pattern recognition – розпізнання образів;
guidance – керування.

Part 2

COMPUTER SYSTEMS: AN OVERVIEW

Task 1. Look through, read and learn the following words:

architect – архітектура, структура; unit – пристрій, модуль; accessory equipment – допоміжні пристрої;engineering background – технічна підготовка, кваліфікація; analyst – аналітик, системний розробник;product line – серія продукції; application programmer – прикладний програміст; to simulate – моделювати, імітувати;voltage – напруга; discrete – окремий; continuous quantity – безперервна величина; on-going process – тривалий, безперервний; to rely – покладатися; household appliances – домашні прилади; indoor climate control system – система регуляції температури в будинку.

Task 2. Read and translate the text:

COMPUTER SYSTEM ARCHITECTURE

As we know all computer systems perform the functions of inputting, storing, processing, controlling, and outputting. Now we'll get acquainted with the computer system units that perform these functions. But to begin with let's examine computer systems from the perspective of the system designer, or architect.

It should be noted that computers and their accessory equipment are designed by a computer system architect, who usually has a strong engineering background. As contrasted with the analyst, who uses a computer to solve specific problems, the computer system architect usually designs computer that can be used for many different applications in many different business. For example, the product lines of major computer manufacturers such as IBM, Digital Equipment Corporation and many others are the result of the efforts of teams of computer system architects.

Unless you are studying engineering, you don't need to become a computer system architect. However, it is important that as a potential user, applications programmer or systems analyst you understand the functions of the major units of a computer system and how they work together.

Types of computers

The two basic types of computers are analog and digital. Analog computers simulate physical systems. They operate on the basis of an analogy to the process that is being studied. For example, a voltage may be used to represent other physical quantities such as speed, temperature, or pressure. The response of an analog computer is based upon the measurement of signals that vary continuously with time. Hence, analog computers are used in applications that require continuous measurement and control.

Digital computers, as contrasted with analog computers, deal with discrete rather than continuous quantities. They count rather than measure. They use numbers instead of analogous physical quantities to simulate on-going, or real-time processes. Because they are discrete events, commercial transactions are in a natural form for digital

computation. This is one reason that digital computers are so widely used in business data processing.

Machines that combine both analog and digital capabilities are called hybrid computers. Many business, scientific, and industrial computer applications rely on the combination of analog and digital devices. The use of combination analog devices will continue to increase with the growth in applications of microprocessors and microcomputers. An example of this growth is the trend toward installing control systems in household appliances such as microwave ovens and sewing machines. In the future we will have complete indoor climate control systems and robots to do our housecleaning. Analog sensors will provide inputs to the control centers of these systems, which will be small digital computers.

Task 3. Answer the questions:

1. Who designs computers and their accessory equipment? 2. What is the role of an analyst? 3. Is it necessary for a user to become a computer system architect? 4. What functions do computer systems perform? 5. What types of computers do you know? 6. What is the principle of operation of analog computers? 7. How do digital computers differ from analog computers? 8. Where are digital and analog computers used? 9. What are hybrid computers? 10. Where do they find application?

Task 4. Give the equivalents to the following word combinations:

Функції вводу, зберігання, обробки, управління та виводу інформації; познайомитись; системні блоки; для початку; допоміжні пристрої; розробник комп'ютерної системи; гарна комп'ютерна підготовка; різні сфери застосування; корпорація цифрового обладнання; прикладний програміст; системний розробник; головні пристрої комп'ютерної системи; моделювати фізичні одиниці; вимірювання сигналів; відмінно від; мати справу скоріше з дискретними, ніж безперервними величинами; в режимі реального часу; комерційні операції; цифрове обчислювання; аналог-цифрові комп'ютери; тенденція до встановлення систем управління; домашні прилади.

Task 5. Make up nouns from the verbs with help of the next suffixes; translate them into your mother tongue:

A. -er, -or

To control, to compute, to design, to use, to manufacture, to work, to simulate, to operate, to protect, to process, to deal, to perform, to examine, to program, to execute, to transmit, to convert, to print, to consume, to record.

B. -don, -sion

To organize, to collect, to combine, to apply (ic), to represent, to add, to corporate, to transact, to compute, to produce, to operate, to execute, to protect, to substitute, to prepare, to invent, to decide, to eliminate, to communicate, to correct, to inform.

C. -ment

To require, to measure, to equip, to invest, to accomplish, to improve, to develop, to achieve, to displace, to govern, to move.

Task 6. Translate sentences into your mother tongue:

1. When entering the Internet, I always find a lot of interesting information. 2. Though never built Babbage's analytical engine was the basis for designing today's computers. 3. When written in a symbolic language programs require the translation into the machine language. 4. While operating on the basis of analogy analog computers simulate physical systems. 5. When used voltage represents other physical quantities in analog computers. 6. Being discrete events commercial transactions are in a natural form for a digital computer. 7. As contrasted with the analyst, the computer system architect designs computers for many different applications. 8. While dealing with discrete quantities digital computers count rather than measure, 9. When using a microcomputer you are constantly making choice - to open a file, to close a file, and so on. 10. As known all computer systems perform the functions of inputting, storing, processing, controlling, and outputting.

Task 7. Look, read and learn the following words:

system software – системне програмне забезпечення; application software – прикладне програмне забезпечення; firmware – вбудоване програмне забезпечення; visible units – видимий блок; to associate – поєднувати; to executive applications programs – виконувати прикладні програми; associated documentation – відповідна документація; payroll – платіжна відомість; inventory control – інвентаризація; investment analyses – аналіз інвестицій; read-only memory (ROM) – постійний пристрій пам'яті; to refer to – відноситись до, посилатися на; to substitute – заміщати; to accomplish – завершувати.

Task 8. Read and translate the text, explain how you understand "software" and "hardware".

HARDWARE, SOFTWARE, AND FIRMWARE

The units that are visible in any computer are the physical components of a data processing system, or hardware. Thus, the input, storage, processing and control devices are hardware. Not visible is the software - the set of computer programs, procedures, and associated documentation that make possible the effective operation of the computer system. Software programs are of two types: systems software and applications software.

Systems software are the programs designed to control the operation of a computer system. They do not solve specific problems. They are written to assist people in the use of the computer system by performing tasks, such as controlling all of (lie operations required, to move data into and out of a computer and all of the steps in executing an application program. The person who prepares systems software is

referred to as a systems programmer. Systems programmers are highly trained specialists and important members of the architectural team.

Applications software are the programs written to solve specific problems (applications), such as payroll, inventory control, and investment analysis. The word program usually refers to an application program, and the word programmer is usually a person who prepares applications software.

Often programs, particularly systems software, are stored in an area of memory not used for applications software. These protected programs are stored in an area of memory called read-only memory (ROM), which can be read from but not written

Firmware is a term that is commonly used to describe certain programs that are stored in ROM. Firmware often refers to a sequence of instructions (software) that is substituted for hardware. For example, in an instance where cost is more important than performance, the computer system architect might decide not to use special electronic circuits (hardware) to multiply two numbers, but instead write instructions (software) to cause the machine to accomplish the same function by repeated use of circuits already designed to perform addition.

Task 9. Answer the questions:

1. What is hardware? 2. Give the definition of software. 3. What are the types of software? 4. What are systems software? 5. What kind of tasks do systems software perform? 6. Who prepares systems software? 7. What are applications software? 8. What problems do applications software solve? 9. What is firmware? 10. How can a computer system architect use firmware?

Task 10. Give the equivalents to the following word combinations:

Видимі пристрої; система обробки даних; апаратне забезпечення; набір комп'ютерних програм; відповідна документація; ефективна робота; системне програмне забезпечення; прикладне програмне забезпечення; системний програміст; платіжна відомість; переоблік; аналіз інестицій; прикладна програма; що працює тільки в режимі читання; постійний пристрій пам'яті; послідовність команд; у випадку; продуктивність; електричне коло; перемножувати числа; змусити машину виконувати ту ж функцію; виконувати додавання.

Task 11. Recall the meaning of the following words and phrases; translate them into your mother tongue:

Architecture: communication architecture; computer architecture; disk architecture; microprocessor architecture; network architecture; security architecture; system architecture; virtual architecture.

Software: system software; application software; database software; disk software; educational software; game software; management software; simulation software.

Hardware: computer hardware; device hardware; display hardware; memory hardware; mouse hardware; network hardware, system hardware; video hardware.

Procedure: accounting procedure; computational procedure; control procedure; data-processing procedure; decision procedure; error-correcting procedure; formatting procedure; installation procedure; management procedure; solution procedure.

Protection: computer protection; data protection; device protection; display protection; error protection; hardware protection; software protection; resource protection; security protec1 ion; system protection; virus protection.

UNIT 2 Science

Part 1

CHEMISTRY

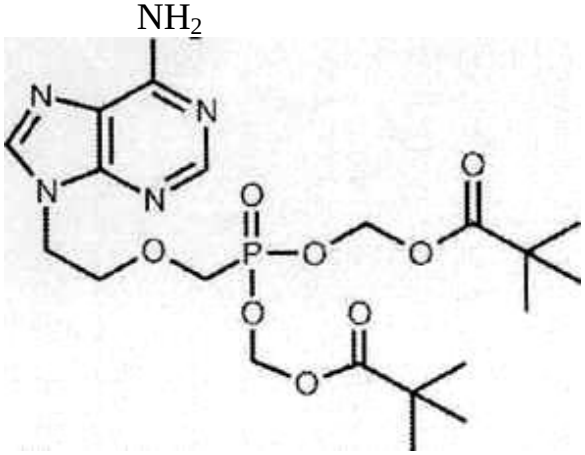
Task 1. Read the text, make its pre-translating analysis and translate the first part.

HEPSERA™
(Gilead) adefovir dipivoxil Tablets

DESCRIPTION

HEPSERA is the tradename for adefovir dipivoxil, a diester prodrug of adefovir. Adefovir is an acyclic nucleotide analog with activity against human hepatitis B virus (HBV).

The chemical name of adefovir dipivoxil is 9-[2-[bis[(pivaloyloxy)methoxy]phosphinyl]methoxy]ethyl]adenine. It has a molecular formula of C 20 H 32 N 5 O 8 P, a molecular weight of 501.48 and the following structural formula:



Adefovir dipivoxil is a white to off-white crystalline powder with an aqueous solubility of 19 mg/mL at pH 2.0 and 0.4 mg/mL at pH 7.2. It has an octanol/aqueous phosphate buffer (pH 7) partition coefficient (log p) of 1.91.

HEPSERA tablets are for oral administration. Each tablet contains 10 mg of adefovir dipivoxil and the following inactive ingredients: sodium, lactose monohydrate, magnesium stearate, pregelatinized starch, and talc.

Mechanism of Action:

Adefovir is an acyclic nucleotide analog of adenosine monophosphate. Adefovir is phosphorylated to the active metabolite, adefovir diphosphate, by cellular kinases. Adefovir diphosphate inhibits HBV DNA polymerase (reverse transciptase) by competing with the natural substrate deoxyadenosine triphosphate and by causing DNA chain termination after its incorporation into viral DNA. The inhibition constant (K i) for adefovir diphosphate for HBV DAN polymerase was 0.1 μM. Adefovir diphosphate is a weak inhibitor of human DNA polymerases (alpha) and (gamma) with K i values of 1.18 μM and 0.97 μM, respectively.

CLINICAL PHARMACOLOGY

Pharmacokinetics:

The pharmacokinetics of adefovir have been evaluated in healthy volunteers and patients with chronic hepatitis B. Adefovir pharmacokinetics are similar between these populations.

Absorption:

Adefovir dipivoxil is a diester prodrug of the active moiety adefovir. Based on a cross study comparison, the approximate oral bioavailability of adefovir from a 10 mg single dose of HEPSERA is 59%.

INDICATIONS AND USAGE

HEPSERA is indicated for the treatment of chronic hepatitis B in adults with evidence of active viral replication and either evidence of persistent elevations in serum aminotransferases (ALT or AST) or histologically active disease.

This indication is based on histological, virological, biochemical, and serological responses in adult patients with HBeAg+ and HBeAg- chronic hepatitis B with compensated liver function, and in adult patients with clinical evidence of lamivudine-resistant hepatitis B virus with either compensated or decompensated liver function.

CONTRAINDICATIONS

HEPSERA is contraindicated in patients with previously demonstrated hypersensitivity to any of the components of the product.

PRECAUTIONS

Drug Interactions

Since adefovir is eliminated by the kidney, co-administration of HEPSERA with drugs that reduce renal function or compete for active tubular secretion may increase serum concentrations of either adefovir and/or these co-administered drugs.

Apart from lamivudine, trimethoprim/sulfamethoxazole and acetaminophen, the effects of co-administration of HEPSERA with drugs that are excreted renally, or other drugs known to affect renal function have not been evaluated.

Patients should be monitored closely for adverse events when HEPSERA is co-administered with drugs that are excreted renally or with other drugs known to affect renal function.

Ibuprofen 800 mg three times daily increased adefovir exposure by approximately 23%. The clinical significance of this increase in adefovir exposure is unknown.

While adefovir does not inhibit common CYP450 enzymes, the potential for adefovir to induce CYP450 enzymes is not known.

The effect of adefovir on cyclosporine and tacrolimus concentrations is not known.

Duration of Treatment

The optimal duration of HEPSERA treatment and the relationship between treatment response and long-term outcomes such as hepatocellular carcinoma or decompensated cirrhosis are not known.

OVERDOSAGE

Doses of adefovir dipivoxil 500 mg daily for 2 weeks and 250 mg daily for 12 weeks have been associated with gastrointestinal side effects. If overdose occurs the

patient must be monitored for evidence of toxicity, and standard supportive treatment applied as necessary.

Following a 10 mg single dose of HEPSERA, a four-hour hemodialysis session removed approximately 35% of the adefovir dose.

DOSAGE AND ADMINISTRATION

The recommended dose of HEPSERA in chronic hepatitis B patients with adequate renal function is 10 mg, once daily, taken orally, without regard to food. The optimal duration of treatment is unknown.

HOW SUPPLIED

HEPSERA is available as tablets. Each tablet contains 10 mg of adefovir dipivoxil. The tablets are white and debossed with "10" and "GILEAD" on one side and the stylized figure of a liver on the other side. They are packaged as follows: Bottles of 30 tablets (NDC 61958-0501-1) containing desiccant (silica gel) and closed with a child- resistant closure.

Store in original container at 25 °C (77 °F), excursions permitted to 15-30 °C (59-86 °F) (See USP Controlled Room Temperature).

Do not use if seal over bottle opening is broken or missing.

Gilead Sciences, Inc. Foster City, CA 94404

June 2003

HEPSERA™ is a trademark of Gilead Sciences

Task 2. Find English equivalents for the following lexical units. Learn them.

торговельне призначення, гіперчутливість, попередник, застережні заходи, хімічна назва, виводитись нирками, розчинність у воді, одночасне призначення, пероральне застосування, оптимальна тривалість лікування, інгібірувати полімеразу, бути оціненим на добровольцях, побічні реакції, результати перехресного дослідження, передозування, здійснювати спостереження на предмет ознак токсичної дії, біодоступ, показники до застосування, бути показаним для лікування, одноразове застосування, бути основаним на гістологічній, віралогічній, біохімічній та сіркологічній відповідях.

Task 3. Translate into English.

1. Адефовіру діпівоксил являє собою кристалічний порошок білого чи жовтуватого кольору з розчинністю у воді 19 мг/мл. Препарат випускається у вигляді пігулок.
2. Препарат призначений для орального застосування. Кожна пігулка містить 10 мг адефовіру діпівоксилу, а також ряд неактивних елементів; при одноразовому застосуванні в дозі 10 мг біодоступність адефовіру складає приблизно 59 %.
3. Препарат показаний для лікування хронічного гепатиту В у дорослих з гістологічними ознаками активності захворювання і протипоказаний пацієнтам з гіперчуйністю до будь-якого з компонентів препарату.

4. Оскільки адефовір виводиться нирками, то одночасне призначення його з іншими препаратами може призвести до збільшення концентрації адефовіру і / чи вищезазначених препаратів у сироватці крові. У випадку передозування за пацієнтом має здійснюватись ретельне спостереження на предмет ознак токсичної дії. Пацієнтам з хронічним гепатитом В і збереженою функцією нирок рекомендується призначати препарат у дозі 10 мг на добу одноразово.

Task 4. Read the text, make its pre-translating analysis and translate the text.

ESTERS OF CARBOXYLIC ACIDS

Many esters of carboxylic acids and saturated hydrocarbons possess pleasant odors and are often found in plants, accounting for the fragrance of flowers and the flavour of fruits and berries. Some of these esters can be prepared artificially and are widely used under the name of "fruit essences" in confectionery, in the manufacture of soft drinks, perfumes, etc.

Isoamyl acetate $CH_3COOC_5H_{11}$ (oil of pears) is used as a solvent for celluloid.

Certain derivatives of acrylic acid CH_2=CH-COOH, an easily polymerized unsaturated acid, have acquired great industrial importance. One of them is methyl methacrylate CH_2=C(CH_3)-$COOCH_3$. The polymers of this ester are transparent solids resistant to heat and light. They are used to prepare sheets of strong and light organic glass or plexiglass widely used for the manufacture of various goods.

Theraphthalic acid, a dibasic carboxylic acid of the aromatic series has the structural formula

HOOD _____ COOH

_____

The condensation product of the dimethyl ester of this acid with ethylene glycol is used for the manufacture of lavsan, an artificial fibre.

The polymer of ethylene is called polyethylene, or polythene. It is a white pliable substance resistant to concentrated acids and alkalis.

Polymerization of various compounds containing even bonds is widely used in the chemical industry for the preparation of various kinds of synthetic products - plastics, chemical fibres, artificial resins, synthetic rubbers, lubricants, etc.

Ethylene is the first member of the ethylene hydrocarbon or olefin series. The subsequent members of this series are propylene C_3H_6 butylene C_4H_8, etc.

The main source of ethylene and its homologues is the gases formed during the cracking of oil products.

Cellulose $(C_6H_{10}0_5)_x$ is the chief constituent of the shells of plant cells. In some types of cellulose the value of x is about 1,500. Cellulose contains hydroxyl groups in its molecules and therefore forms ethers and esters.

Artificial fibre is fibre produced by the chemical treatment of natural fibres (mainly cellulose), while synthetic fibre is the name given to fibre prepared from specially synthesized chemical materials.

In the acetate method an acetone solution of acetyl cellulose is forced through dies into a current of warm air. The acetone evaporates, and the jets of solution change into fine threads of acetate fibre.

Capron is a polycondensate of aminocapronic acid. Part of the molecule of this substance is represented below:

-NH-$(CH_2)_5$-CO-

Nylon or anide is obtained by the condensation of dibasic adipic acid HOOC-$(CH_2)_4$- COOH and hexamethylene diamine NH_2-$(CH_2)_6$-NH_2 by heating them together under pressure.

Both these starting materials are derived from phenol (C_6H_5OH) by catalytic reduction and after treatment.

Task 5. Find in the text equivalents for the following lexical units.

1. esters; 2. be prepared artificially;3. confectionery; 4. derivatives; 5. polymerized; 6. solids; 7. homologues; 8. cracking of oil products; 9. evaporate; 10. jets of solution; 11. polycondensate; 12. heating them together under pressure; 13. be derived by catalytic reduction.

Task 6. Prepare the instant translation of the following text.

Safe bug treatment

Microbial contaminants pose another major concern in cooling water treatment. A combination of oxidative and nonoxidative biocides in usually used to treat the microbes. One typical oxidative treatment involves chlorine gas dissolved in the water. However, this has come under fire lately because of Occupational Safety and Health Admin. (OSHA; Washington, D.C.) concerns for the safety and health of operators handling the chemicals.

With chlorine gas being phased out, the use of other oxidative biocides, such as bromine, ozone and chlorine bleach, is being investigated. Bleach, while cheap, must be used in large volumes to remove the microbes, making it less cost effective. Bleach also requires a degree of care similar to that taken when handling chlorine.

Ozone, in contrast, can be generated at the point of use, eliminating handling problems. However, the process is costly and is used only in small-scale applications and with sensitive products, such as microelectronics components, says Calgon's Geraghty.

Part 2

PHYSICS

Task 1. Read the scientific article, make its pre-translating analysis and translate the text.

MEASURING TEMPERATURE

There are in general use today four different temperature scales. These are the Fahrenheit, Rankine, Centigrade and Kelvin or absolute. On the Fahrenheit scale the boiling point of water is fixed at 212°, its freezing point is 32°. The equivalent points on the Centigrade (sometimes called Celsius) scale are 100° and 0°, on the Rankine scale 672° and 492° and on the absolute scale temperature is measured in degrees Centigrade from the point at which molecular motion ceases. Absolute zero is - 273.1° C.

The thermometers are all identically made but each has a different scale. In the United States, the Fahrenheit scale is commonly used in civil life, and the Rankine scale by engineers. The Centigrade and Kelvin scales are used in all countries for scientific measurements.

It is frequently necessary to change temperature readings from one temperature scale to another.

Fahrenheit reading = 9/5 x Centigrade reading + 32 and Centigrade reading = (Fahrenheit reading-32) x 5/9.

There are formulas for such changes:

F° = 32°+9/5 C° C° = 5/9(F°-32°)

32°F = 0°C 5°F = 18°C (room temperature)

T°K = t°C+273°

To change the Fahrenheit (or Rankine) scale into the Kelvin scale, the Fahrenheit scale is changed to the Centigrade scale and then to Kelvin.

F-C-K K-C-K

The first and still most widely used hotness measuring instrument is the simple "liquid-in-glass" thermometer. The volume of liquid expands when hot so that increasing hotness is indicated by extension of the column of liquid (mercury or alcohol) in the glass stem of thermometer. The stem has a very narrow uniform bore or capillary which is sealed at the "top" end. The space above the liquid is evacuated. At the "lower" end of the stem the capillary connects to the bulb or reservoir of liquid. This bulb is placed in contact with the sample.

The common thermometer uses a liquid as an agent to measure temperature and retains the liquid in a glass bulb. But if it is necessary to measure very low or very high temperatures, other than mercury thermometers must be employed. At temperatures below - 39°C, mercury freezes and becomes a solid: at high temperatures glass melts and becomes a liquid. For both of these temperature extremes, electrical thermometers are commonly used. These instruments operate upon the principle that the resistance a wire offers to a flow of electric current through it changes with temperature. The higher temperature, the greater is the resistance.

In a diagram of an electrical thermometer called a thermocouple is illustrated. This temperature recording device is based upon a principle, discovered in 1821, known

as the thermoelectric effect. Two pieces of a wire, one copper and one iron are joined together at the ends to form a complete loop. When one junction is heated and the other is kept cool, an electric current flows around the loop in the direction indicated by the arrows. The greater the difference in temperature between the two junctions, the greater is the electric current.

Diagram represents a thermocouple connected by wires to an ammeter. If the junction of the thermocouple is first placed in melting ice and then in boiling water, the two scale readings of the ammeter can be marked 0°C and 100°C at the appropriate points. These determine the scale of the instrument.

Thermocouples are not always made of copper and iron. Any two different metals when brought into contact will exhibit a thermoelectric effect. For every high temperature measurements, platinum and platinum-indium alloys are used, because of their very high melting point temperatures.

A set of thermocouples, when connected form what is commonly called a thermopile. Thermocouples containing several hundred elements can be made so sensitive that they will detect the heat of a candle flame several hundred feet away.

Task 2. Find equivalents for the following lexical units. Learn them.

1. temperature scales; 2. to change temperature readings; 3. "liquid-in-glass" thermometer; 4. temperature extremes; 5. resistance a wire offers to a flow of electric current; 6. glass stem of thermometer; 7. bore or capillary; 8. bulb; 9. thermocouple; 10. thermopile.

Task 3. Write a precis of the text.

Task 4. Read the article, make its pre-translating analysis and translate the text.

STEEL

Steel is an alloy consisting mostly of iron, with a carbon content between 0.2 and 1.7 or 2.04% by weight (C:1000-10,8.67Fe), depending on grade. Carbon is the most cost- effective alloying material for iron, but various other alloying elements are used such as manganese, chromium, vanadium, and tungsten. Carbon and other elements act as a hardening agent, preventing dislocations in the iron atom crystal lattice from sliding past one another. Varying the amount of alloying elements and form of their presence in the steel (solute elements, precipitated phase) controls qualities such as the hardness, ductility and tensile strength of the resulting steel. Steel with increased carbon content can be made harder and stronger than iron, but is also more brittle. The maximum solubility of carbon in iron (in austenite region) is 2.14% by weight, occurring at 1149 °C; higher concentrations of carbon or lower temperatures will produce cementite. Alloys with higher carbon content than this are known as cast iron because of their lower melting point. Steel is also to be distinguished from wrought iron containing only a very small amount of other elements, but containing 1-3% by weight of slag in the form of particles elongated in one direction, giving the iron a

characteristic grain. It is more rust-resistant than steel and welds more easily. It is common today to talk about 'the iron and steel industry' as if it were a single entity, but historically they were separate products.

Though steel had been produced by various inefficient methods long before the Renaissance, its use became more common after more efficient production methods were devised in the 17th century. With the invention of the Bessemer process in the mid-19th century, steel became a relatively inexpensive mass-produced good. Further refinements in the process, such as basic oxygen steelmaking, further lowered the cost of production while increasing the quality of the metal. Today, steel is one of the most common materials in the world and is a major component in buildings, tools, automobiles, and appliances. Modern steel is generally identified by various grades of steel defined by various standards organizations.

Material properties

Iron, like most metals, is not usually found in the Earth's crust in an elemental state. Iron can be found in the crust only in combination with oxygen or sulfur. Typical iron- containing minerals include Fe_20_3—the form of iron oxide found as the mineral hematite, and FeS_2—pyrite (fool's gold). Iron is extracted from ore by removing the oxygen by combining it with a preferred chemical partner such as carbon. This process, known as smelting, was first applied to metals with lower melting points. Copper melts at just over 1000 °C, while tin melts around 250 °C. Cast iron—iron alloyed with greater than 1.7% carbon—melts at around 1370 °C. All of these temperatures could be reached with ancient methods that have been used for at least 6000 years (since the Bronze Age). Since the oxidation rate itself increases rapidly beyond 800 °C, it is important that smelting take place in a low-oxygen environment. Unlike copper and tin, liquid iron dissolves carbon quite readily, so that smelting results in an alloy containing too much carbon to be called steel.

Other materials are often added to the iron/carbon mixture to tailor the resulting properties. Nickel and manganese in steel add to its tensile strength and make austenite more chemically stable, chromium increases hardness and melting temperature, and vanadium also increases hardness while reducing the effects of metal fatigue. Large amounts of chromium and nickel (often 18% and 8%, respectively) are added to stainless steel so that a hard oxide forms on the metal surface to inhibit corrosion. Tungsten interferes with the formation of cementite, allowing martensite to form with slower quench rates, resulting in high speed steel. On the other hand sulfur, nitrogen, and phosphorus make steel more brittle, so these commonly found elements must be removed from the ore during processing.

When iron is smelted from its ore by commercial processes, it contains more carbon than is desirable. To become steel, it must be melted and reprocessed to remove the correct amount of carbon, at which point other elements can be added. Once this liquid is cast into ingots, it usually must be "worked" at high temperature to remove any cracks or poorly mixed regions from the solidification process, and to produce shapes such as plate, sheet, wire, etc. It is then heat-treated to produce a desirable crystal structure, and often "cold worked" to produce the final shape. In modern steel making these processes are often combined, with ore going in one end of the assembly line and

finished steel coming out the other. These can be streamlined by a deft control of the interaction between work hardening and tempering.

Task 5. Translate into English.

Сталь – ковкий сплав заліза з вуглецем (та іншими елементами), що підлягає деформації, кількість вуглецю в якому не перевищує 2,14%. Вуглець надає міцності сплавам заліза. Сталь – найважливіший конструкційний матеріал для машинобудування, транспорту і т.п. Сталі поділяються на конструкційні та інструментальні.

За хімічним складом сталі поділяються на вуглецеві та легіровані; в тому числі за змістом вуглецю – на маловуглецеві, середньовуглецеві та високовуглецеві; леговані сталі за змістом лнгіруючих елементів – на низько-, середньо- і високолегіровані.

За структурою сталь різниться на аустенітну, феритну, мартенситну, бейнітну і перлітну. Якщо в структурі переважає дві і більше фаз, то сталь різниться на двофазну та багатофазну.

Task 6. Write a precis of the text

UNIT 3 Technology

Part 1

INSTRUMENTATION

Task 1. Read the text, make its pre-translating analysis. Translate into Ukrainian.

TRANSFORMERS

The device by which A. C. voltage is changed is called a transformer. It is known that when the strength of the current flowing in a coil alters, an e. m. f. is induced in any other coil the turns of which are linked to the changing flux. Suppose that an alternating current flows in the first coil; as the current rises, an e. m. f. is induced in one direction in the second coil, and as it falls, an e. m. f. is induced in the opposite direction. An alternating current in the first coil therefore produces an alternating e. m. f. of the same frequency in the second coil. If the circuit of the second coil is completed, the induced

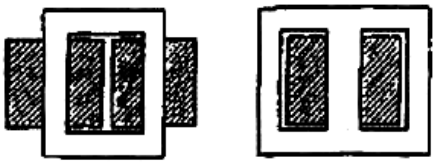


Fig. 1. Transformers

e. m. f. will cause a current to flow.

The winding connected to the source of alternating current is called the primary winding, and that in which the e. m. f. is induced, the secondary winding.

Fig. 1 shows sections of two types of transformers, the shaded areas indicating the space occupied by the windings. In both cases the core is laminated; a number or thin stampings being stacked together to provide the necessary cross-sectional area. The form shown of the left is known as a core-type transformer. Half of each winding is placed on each limb, the primary and secondary being either wound one on top of the other, or else split into small sections arranged alternately on the core. The form shown on the right is known as a shell-type transformer. The core has three limbs, the centre one of which carries the windings, while the other two form parallel return paths for the magnetic flux.

Three-phase currents may be transformed by means of a separate transformer on each phase or by means of a special three-phase transformer. The latter has a separate limb of the core and a separate primary and secondary winding for each phase. As in the case of generator windings, the three primaries and three secondaries may be either star or delta connected.

Task 2. Find in the text equivalents for the following lexical units. Learn them.

1. coil; 2. площа поперечного перерізу; 3. primary winding; 4. стержньовий трансформатор; 5. трансформатор с обмоткою на центральному стержні магнітної системи; 6. secondary winding; 7. зворотний шлях (спосіб); 8. shaded areas; 9. з’єднання у вигляді трикутника; 10. core is laminated.

Task 3. Find factual mistakes in the following sentences and correct them.

1. Пристрій для перетворення постійного струму називається трансформатором.
2. Припустимо, що постійний струм тече у другій котушці; сила струму збільшується і при цьому ЕРС виникає у зворотному напряму у другій котушці; а якщо сила струму зменшується, то ЕРС виникає в прямому напряму.
3. Обмотка, в якій виникає ЕРС, зветься первинною, а обмотка, що приєднується до джерела змінного струму – вторинною.

4. Read the text, make its pre-translating analysis. Translate into Ukrainian.

ELECTRIC MOTORS

A direct-current motor consists of the same essential parts as a direct current generator, namely, field magnet, armature with its commutator and brush gear. The armature and commutator are constructed on exactly the same principles as the armature and commutator of a dynamo, and any difference in external appearances of dynamos and motors is due to a modification in the arrangement of the field magnets and frame, designed to give the motor the maximum amount of protection.

The simple wire loop connected to a two-section commutator is hardly suitable for running as a motor, owing to the supply being short-circuited when both brushes make contact with the same half of the commutator. This difficulty does not arise when the number of commutator segments is increased and most commercial D. C. generators can be made to run as motors.

The effect of armature reaction in a motor is opposite to that in a generator, and in order to allow for it, the brushes are given an angle of lag instead of an angle of lead; that is, they are moved from the mid position in a direction contrary to that of rotation. As in the case of the generator, interpoles are often employed to ensure sparkless commutation. When the armature of a motor rotates, the conductors cut the magnetic field, and an e.m.f. is produced in them just as it is in the case of a generator. This back e.m.f. opposes the applied e. m. f., the difference between them being the voltage which drives the current through the armature resistance. If we multiply the back e. m. f. by the armature current, we obtain the electrical equivalent (in watts), of the mechanical power developed by the motor.

Motors, like generators, may be either series, shunt or compound wound. The speed of a shunt-wound motor does not vary much with the changes in the load, but that of a series-wound motor falls as the load increases.

Note that the direction of rotation of a motor is not reversed by reversing the supply current, because this would change the polarity of both the field and the armature. To reverse the rotation it is necessary to reverse the connections of either the field or the armature, but not both. The speed of a motor can be varied by varying the strength of the field, the speed increasing as the field is weakened. The field strength can be controlled in the same way as that of a generator, i. e. by a resistance, in series with the field-magnet winding of a shunt-wound machine or in parallel with that of a series- wound machine.

Task 5. Find in the text equivalents for the following lexical units. Learn them.

1. direct-current motor; 2. field magnet; 3. armature with its commutator; 4. brush gear; 5. frame; 6. simple wire loop; 7. series, shunt, compound wound; 8. angle of lead; 9. angle of lag; 10 back e.m.f.; 11. щоб компенсувати; 12. щоб усунути; 13. перетинати магнітне поле; 14. напруга, що приводе в рух струм через опір сердечника; 15. швидкість обертання двигуна може змінюватись внаслідок зміни напруги поля.

Task 6. Find lexical mistakes in the following sentences and correct them.

1. Мотор постійного струму складається з основних частин, таких як генератора постійного струму, польового магніту, арматури з комутатором та щіткового пристрою.
2. Як і у випадку з генератором додаткові поля часто займаються забезпеченням безіскрової комутації.
3. Ця проблема не виникає, коли кількість сегментів комутатора збільшується, і більшість комерційних генераторів постійного струму можуть використовуватись, як і мотори.

Part 2

MACHINE BUILDING

Task 1. Read the text, make its pre-translating analysis. Translate into Ukrainian.

MECHANICAL ENGINEERING

Couplings and Clutches

Couplings and clutches are intended to connect shafts or other revolving parts and in modern mechanical engineering they form integral components of almost all machines. Couplings and clutches link together the shafts of turbines and generators, prime movers and driving mechanisms, as well as the shafts of separate units and assemblies effect smooth or instantaneous starting stopping, reversing and gear change of machines; protect against overload and racing and prevent reverse rotation.

Hence the great diversity of types of couplings and clutches and the continuous development of new designs.

Clutches are employed to connect and disconnect shafts during their relative motion (under load) or at standstill. According to the forces which keep them engaged, clutches may be divided into four groups: friction, claw (toothed) electromagnetic fluid, and electromagnetic powder, and hydraulic clutches. Depending on the manner in which clutches are operated they are subdivided into those controlled by an operator directly or by means of auxiliary force, and power controlled clutches.

Advantages of Welded Work over Riveted Work

The application of welding instead of riveting to make permanent joints has a number of advantages, the chief being economy of material and labour. Metal is saved due to: a) the lighter weight of members joined by welding (the weight of welds comprises about 1-1,5 per cent of the work weight while the weight of rivets is about 3.5-4 per cent);

b) the better utilization of metal due to the absence of holes which weaken the-effective sections;

c) the possibility of a wide use of butt-joined seams requiring no additional elements such as straps.

The use of welding instead of riveting saves on an average 10 to 20 per cent in weight.

Less labour is required because it is no longer necessary to lay out, punch or drill the holes. Besides riveting is much more complicated and less productive job than welding which can be often largely automated.

Task 2. Make up a glossary to the texts (no less than 15 lexical units).

Task 3. Read and translate the text into English.

Різьбові з’єднання

Основними стандартними деталями кріплення є: болти, шпилька, гвинти, гайки. З цими деталями зазвичай застосовуються гайки та гайкові замки

(стопорячі деталі) різноманітних конструкцій. Загалом різьбове з'єднання можна створити і без деталей, що є специфічно кріпильними.

Болт являє собою стержень з різьбою для гайки на одному кінці та головкою на іншому.

Шпилька – це стержень з різьбою на обох кінцях; одним (посадочним) кінцем шпилька угвинчується в нарізний отвір однієї з сполучних деталей, на різьбу іншого кінця нагвинчується гайка.

Гвинт відрізняється від болта лише тим, що його різьбова частина угвинчується в одну із сполучних деталей (з'єднання без гайки).

Гайка має нарізний отвір для нагвинчування на різьбовий кінець болта чи шпильки і є замикаючою деталлю у силовому ланцюзі: болт (шпилька) – деталі, що кріпляться – гайка.

Task 4. Find in the text Ukrainian equivalents of the following lexical units and learn them.

1. bolt; 2. pin (stud); 3. screw; 4. nut; 5. spanner; 6. threaded coupling; 7. shank; 8. landing end; 9. threaded hole; 10. power circuit.

Task 5. Read the text, make its pre-translating analysis. Translate into Ukrainian.

ENGINEERING MATERIALS

1. Materials used in mechanical engineering consist chiefly of metals, alloys and plastics, which have almost completely replaced timber largely used in the past. Rubber is employed for some purposes — mainly for fittings, packings, and washers. Leather is also used for washers, pump-plungers and driving belts.

2 . Metals of various types and their alloys are by far the most widely used materials. One of the oldest is cast iron, which is made from iron-ore by smelting it in a kiln or chamber, called a "blast furnace". Run off into sand moulds and cooled, the cast iron forms blocks called pigs.

3. Cast iron is strong in compression but weak in tension. It is therefore used for making bases for machinery, stands, engine bed-plates, framework for machines, brackets, pedestal bodies, bearing-housings, gear-wheels, pulleys, intricate casings for machinery, engine cylinders, domestic utensils, fire-grades and architectural fittings of an ornamental nature, or anything in which tensile stress in not involved.

4. Steel is produced by melting cast iron (pigs) and refining it to remove some of the carbon and other impurities. Special kinds of steel comprise mild or structural steel, alloy steel, stainless steel, carbon (or too!) steel, self-(or air-) hardening tool steel, heat-resisting steel, and many others.

5. One method of preventing a nut from loosening is to fit what is termed a spring washer. There are several forms of these, and each claims its particular merit. When placed in position on a bolt, and the nut screwed on, the nut screwed on, the reaction of the spring, as it is compressed, exerts pressure against the nut and prevents the latter from turning and working loose.

6. When two shafts have their axes set at right angles to each other, the shafts may be driven, or rotate by the use of bevel gears. If it is desired to rotate one shaft at a different speed from the other, a bevel gear-wheel and bevel pinion would be used.

Task 6. Find in the text equivalents of the following lexical units and learn them.

1. an alloy; 2. timber; 3. a fitting; 4. a washer; 5. a pump-plunger; 6. a kiln or a chamber; 7. a sand mould; 8. cast iron is strong in compression but weak in tension: 9. an engine bed-plate; 10. a framework for machines; 11. a pedestal body; 12. a bearing-housing; 13. an intricate casing for machinery; 14. a fire-grade; 15 mild steel; 16. structural steel; 17. alloy steel; 18. stainless steel; 19. self- (or air-) hardening tool steel; 20. heat resisting steel; 21. bevel gear.

Task 7. Make up 10 sentences using the lexical units of exercise 6.

TRANSMITTERS, CONTROLLERS AND SWITCHES

Task 8. Read the text, make its pre-translating analysis. Translate into Ukrainian.

TRANSMITTERS

Differential pressure transmitters, except for transmitters furnished with diaphragm seals or measuring level, shall be provided with five (5)-valve manifolds. And pressure transmitter shall be prepared with 2-valve manifolds with bleed valve.

As a rule, conventional type transmitter with local indicator is owner preference. However, smart type with hart communication shall be applied where several process operating mode exist and/or instrument range change is required according to the operation requirement.

Regards with the above, conventional type shall be applied for ESD.

Where the transmitters are furnished with diaphragm seals, the process connections shall normally be flanged as far as possible. Pancake type remote diaphragm seal is preferable, where is possible to select.

All process wetted parts of pressure transmitters and differential pressure transmitters including manifolds shall be type 316 stainless steel or better. Other materials shall be used as required by the process conditions.

PNEUMATIC INDICATING CONTROLLERS

Where the controls are performed locally, pneumatic indicating controllers, which receive pneumatic signal from the transmitters, shall normally be applied. The input signal, set point and output signal shall be indicated on the controllers. The controllers shall be furnished with an automatic-manual transfer system and the control action, direct or reverse, shall be changeable. The measurement element shall usually be bronze bellows.

SWITCHES

All process wetted parts of switches, such as level switches, pressure switches, temperature switches, shall be selected to meet the process conditions.

The contact shall be of the micro switch type, Single Pole Double Throw (SPDT) as a minimum. For IS applications, the contacts shall be gold plated and the rating shall be max. 30 VDC 0.1 A. For non-IS applications, the contacts rating shall not be less than 30 VDC 0.2A.

Task 9. Make up a glossary to the text (no less then 30 lexical units).

Task 10. Make up 10 sentences using the lexical units of the glossary.

Part 3

AUTOMOTIVE INDUSTRY

Task 1. Read the text, make its pre-translating analysis. Translate into Ukrainian.

CARS

Cars are the main means of transport for billions of people around the world, and they dominate our cities in a way that no other machine does. There are now enough cars in the world to make a traffic jam stretching right round the world ten times.

THE EIRST CARS

Nicolas Cugnot built a steam-powered vehicle as long ago as 1769. But Cugnot's steam engine was far too heavy and slow to be practical. A century later, in 1862, another Frenchman, Etienno Lenoir, created the light and powerful internal combustion engine - that is, an engine like those in modern cars. Lenoir set up his engine in an old horse cart so that it drove the wheels via a chain round the axles. The idea worked so well that soon the first experimental cars were being built - many, like Lenoir's based on horse carts, which is why early cars wire called 'horseless carriages'. In 1S85, the first cars to be sold to the public came out of the workshop of Karl Benz in Mannheim, Germany.

PETROL POWER

Most cars are powered by a petrol engine. This works by burning fuel (a mix of petrol and air) inside tubes in the engine called cylinders. - When the fuel is ignited (set on fire) by a big electric spark, it swells rapidly and forces a drum the called the piston down the cylinder. The piston turns a rod called the crankshaft and this turns the wheels via a series of gears. On most cars, the engine only turns two wheels - usually at the front -called the driving wheels. On cars designed for going off roads the engine drives all four wheels. This is called four-wheel drive.

To improve performance and reduce fuel consumption, many modern cars include electronics and computers to time the spark perfectly, and to deliver just the right mix of fuel.

The big problem with cars is the exhaust - that is, all the hot gases left over after the fuel is burned, blown out through the exhaust pipe. Car exhausts are by far the biggest source of air pollution in most cities, chucking out poisonous gas, dirt and gases that may help cause global warming. Many new cars have catalytic converters in the exhaust to filter out some of the poisonous gases.

HIGH-PERFORMANCE CAR

High -performance cars are recognizable from their sleek-shape. The shape is aerodynamic, to help the car slice through the air with the minimum resistance. The powerful engine is not in the front as in ordinary cars, but in the middle or at the back to keep the car stable and deliver power straight to the back wheels. Fuel Injectors squirt the right dose of fuel into the cylinders and electronic ignition ensures the spark is well-timed. Squat low-profile tyres keep plenty of rubber in contact with the road for maximum grip when accelerating or braking.

Task 2. Find in the text equivalents of the following lexical units, translate and learn them.

1. traffic jam; 2. steam-powered vehicle; 3. internal combustion engine; 4. horse cart; 5. petrol engine; 6. cylinder; 7. to ignite; 8. to swell; 9. crankshaft; 10. driving wheels; 11. four-wheel drive; 12. fuel consumption; 13. exhaust pipe; 14. catalytic converters; 15. sleek shape; 16. fuel injector; 17. to squirt; 18. to ensure the spark; 19. squat low- profile tires; 20. braking.

Task 3. Make up 10 sentences using the lexical units of exercise 2.

Task 4. Read the text and make its pre-translating analysis.

AUTOMOBILE

By name auto, also called motorcar, or car is a usually four-wheeled vehicle designed primarily for passenger transportation and commonly propelled by an internal-combustion engine using a volatile fuel.

The modern automobile is a complex technical system employing subsystems with specific design functions. Some of these consist of thousands of component parts that have evolved from breakthroughs in existing technology or from new discoveries such as electronic computers, high-strength plastics, and new alloys of steel and nonferrous metals, as well as from factors such as air pollution, safety legislation, and foreign competition.

Passenger cars have emerged as the primary means of family transportation, with the total number in use worldwide expected to reach half a billion in the 1990s, One-third of these are in the United States, where more than 1.5 trillion miles are traveled each year. Approximately 500 different models have been offered annually to U.S. car buyers, about half domestic and half foreign in origin. New designs have been brought into the market more quickly in recent years than in the past to permit manufacturers to capitalize on their proprietary technological advances. With more than 30 million new units built each year worldwide, manufacturers have been able to split up the total into many very small segments that nonetheless remained economical to market,

New technical developments are recognized to be the key to successful competition, Research and development engineers and scientists have been employed by all automobile manufacturers and suppliers to improve the car body, chassis, engine, drive train, vehicle control systems, occupant safety, and environmental emissions, and further work by the industry is necessary to meet the needs of the 21st century.

Vehicle design depends to a large extent on its intended use. Automobiles for off-road use in countries that lack service facilities must be durable, simple systems with high resistance to severe overloads and extremes in operating conditions. Conversely, the customers for products that are intended fir the high-speed, limited-access road systems in Europe and North America expect more passenger comfort options, increased engine performance, and optimized high-speed handling and vehicle stability. Stability depends principally on the distribution of weight between the front and rear

wheels, the height of the centre of gravity and its position relative to the aerodynamic centre of pressure of the vehicle, suspension characteristics, and whether front or rear wheels are used for propulsion. Weight distribution depends principally on the location and size of the engine. The common practice of front-mounted engines exploits the stability that is more readily achieved with this layout. The development of aluminum engines and new manufacturing processes have, however, made it possible to locate the engine at the rear without necessarily compromising stability.

SAFETY SYSTEMS

From its beginnings, the automobile posed serious hazards to public safety. Vehicle speed and weight provided an impact capacity for occupants and pedestrians that produced great numbers of fatalities (13,000 in 1920) and serious injuries. During the 20th century, the rates of death and injury declined significantly in terms of vehicle miles (in the United States, for example, the rate of fatalities declined from 5.7 to 2.2 per 100,000,000 vehicle miles between 1966 and 1990). Because of the increased number of vehicles on the road, however, total fatalities have declined only slightly (from 53,000 down to 47,000 in the same example period). Most fatal accidents occur on either city streets or secondary roads. Federal expressway systems are relatively safer. Driver training, vehicle maintenance, highway improvement, and law enforcement were identified as key areas with potential for improving safety, but the basic design of the vehicle itself and the addition of special safety features received increased attention. Safety features of automobiles come under two distinct headings: accident avoidance and occupant protection.

Task 5. Write a precis of the text.

Task 6. Match the words from part A with those from part B, translate and learn the word combinations.

A.	**B.**
internal-combustion	road
volatile	emissions
electronic	performance
high-strength	safety
nonferrous	stability
safety	train
foreign	engines
proprietary	technological advances
drive	accident
occupant	competition
environment	maintenance
limited-access	legislation
engine	enforcement
vehicle	metals
front-mounted	avoidance
fatal	plastics

vehicle	engine
law	fuel
accident	computers

Task 7. Read the first part of the text, make its pre-translating analysis. Translate into Ukrainian.

HONDA ANNOUNCES NEW CIVIC TYPE R

14 September 2006 - Honda Motor Europe Ltd today announced the eagerly awaited new Civic Type R. the successor to a model whose unique blend of affordability. exhilarating driving characteristics and everyday usability resulted in sales that exceeded all expectations.

Given the outstanding performance credentials of its predecessor, Honda saw little purpose in increasing engine output. The new Type R therefore continues to be powered by a naturally-aspirated 2.0 litre DOHC i-VTEC engine with similar output, but reworked for greater refinement and responsiveness thanks to a new balancer shaft and a drive-by-wire throttle. The 201 PS maximum power output is now reached at 8,000 rpm (previously 200 PS at 7,400 rpm).

VTEC variable valve timing and VTC variable inlet camshaft technology continue to underpin the engine architecture. Its exhilarating, high revving nature is retained, but the switch to high lift, long duration valve timing now takes place at a lower 5,200 rpm, and continues all the way to the 8.000 rpm red line. There is a new i-VTEC indicator just to the right of the digital speedometer which is illuminated within this rev range.

Task 8. Read the second part of the text and translate it into English.

Шасі 5-дверної моделі Honda Civic – вже високо оцінене за свій баланс керованості – стало основою для всіх 3-дверних моделей і забезпечило ідеальну платформу для Type R. Зібрана на підвісі Civic Type S, яка ідеально налаштована для більш різкої динаміки шасі, модель Type R отримала модифікації, які надали можливість перейти їй на новий рівень. Як і у Type R, відстань між її задніми колесами на 20 мм ширше, ніж у 5-дверної моделі, а характеристики амортизаторів і ресор є абсолютно унікальними для Type R.

Крім того, 18-дюймові покришки розміру 225/40 поліпшують зціплення з дорогою, а зниження висоти корпусу на 15 мм сприяє зменшенню розхитування кузова. Більш жорстке рульове управління та більш рухомі кріплення рульового управління забезпечують душе швидкий відгук, в той час як центральне розташування паливного баку під підлогою кабіни знижує центр тяжіння і зменшує інерційний момент кузова.

Part 4

METALLURGY

Task 1. Read the text to yourself within a minute and find out which aspect of ferrous metallurgy it deals with.

BURDEN PREPARATION TO THE BLAST-FURNACE PROCESS

The relatively high thermal and chemical efficiency of the blast furnace is a result of the countercurrent flow of ascending gas and descending burden materials in it. To obtain high driving rates of the blast furnace and fuel economies one has to provide the furnace with the burden materials of some certain quality. Under the conditions of counter-flow the burden materials must not restrict the gas flow, and at the same time must have better contact with gases. Then, the smelting of the burden in the blast furnace must demand as less heat as possible. Natural raw materials can't ensure these requirements, so they need the intensive burden preparation. There are two methods of agglomeration in the iron-making industry — sintering and pelletizing.

Task 2. Read the text within six minutes and make up a short outline of it.

SINTERING

1. Almost all iron ores require concentration. The ore concentrate is a powdery material, unsuitable for blast-furnace smelting. Before charging into the blast furnace it must be agglomerated into lumps. Two agglomeration methods are generally used: sintering and pelletizing.

Sintering is presently the predominant process while pelletizing is a developing method. Sintering may be defined as a process in which iron-bearing materials of a fine particle size are converted into coarse agglomerates by partial fusion. The product has a porous structure, rezembling a «clinker» in physical appearance, and its mineralogy may be substantially different from that of the original iron-bearing fines.

2. The principle of agglomerating by partial fusion has been known for centuries. But sintering, as we know it today, originated at the beginning of the 20th century after the invention in 1906 by Dewght-Lloyd, of the first continuous sintering machine, a chain grate design. In sintering, a shallow bed of the fine particles is agglomerated by heat exchange and partial fusion of the quiescent mass. Heat is generated by combustion of a solid fuel admixed with the bed of fines being agglomerated. The combustion is initiated by igniting the fuel exposed at the surface of the bed, after which a narrow, high temperature zone is caused to move through the bed by an induced draft applied at the bottom of the bed. Within this narrow zone, the surfaces of adjacent particles reach fusion temperature, and gangue constituents form a semi-liquid slag. The bonding is effected by a combination of fusion and grain growth. The incoming air quenches and solidifies the rear edge of the advancing fusion zone.

3. In the ferrous industry, the essential materials for sintering consist of a mixture of iron-bearing fines, fluxes and a solid particulated fuel. The iron-bearing constituents are principally iron ore fines, recycled sinter fines, and flue dust, but may also include

mill scale, open hearth precipitator dust, and similar iron-bearing materials. Coke breeze is the most common solid fuel, but other carbonaceous materials are also used. It has become common practice to incorporate the sinter mix limestone fines, dolomite fines and lime as a flux. This composite of fine material is well mixed and placed on the sinter strand in a shallow bed, seldom less than six inches or more than twenty inches depth.

4. Upon ignition, within a furnace which straddles the bed, the surface of the bed is heated to about 2500° F, combustion of the fuel is initiated, and the fine particles at the surface are fused together. As air is drawn through the bed, the high temperature zone of combustion and fusion moves downwardly through the bed and produces the bonded, cellular structure of the sinter. During the process, the induced air is preheated by the hot sinter overlying the combustion and fusion zones, and the sensible heat, contained in the combustion products and the excess air is transferred to the bed below the fusion zone. Thus, a temperature distribution exists through the bed such that a series of physically and chemically separate zones are formed.

5. Five commonly observed zones are characterized as follows:

1. Zone of Sinter represents the product of the process.

2. Zone of Combustion and Fusion. It is within this zone that oxidation of carbon to carbon monoxide and carbon dioxide provides the large quantity of heat for slag formation and the fusion of the ore particles.

3. Zone of Calcination. At this level in the bed, the gas stream is sufficiently hot as to calcinate the carbonates.

4. Dry and Preheat Zone. Within this zone the charge has been heated sufficiently to volatilize free moisture.

5. Wet Zone. The moisture level of the upper part of this zone may be raised by the condensation of moisture removed from the previous zones. Excess condensation can fill the pore space with water, cause the collapse of the micropellets, and seriously decrease the bed permeability.

PRELIMINARY WORK WITH THE TEXT LEXICAL EXERCISES

Task 3. Listen to the tape-recorded words and word combinations. Memorize them.

1. iron ore concentrate — залізорудний концентрат, 2. sintering — агломерація, 3. pelletizing — огрудкування, 4. predominant process — домінуючий процес, 5. coarse agglomerate — крупний агломерат, 6. in physical appearance —за зовнішнім виглядом, 7. at the surface of the bed — над поверхнею шару (горну), 8. the surface of adjacent particles — поверхня суміжних часток, 9. fusion temperature — температура плавлення, 10. gangue constituents — шлакоформуючі складові, 11. bonding — усталення, 12. rear edge — верхня окрайка, 13. fusion zone — зона оплавлення, 14. mixture of iron-bearing fines — суміш залізовмісного дріб'язку, 15. particulated fuel — здрібнене паливо, 16. recycled sinter fines — повернення, 17. flue dust — колошниковий пил, 18. mill scale — прокатна окалина, 19. open hearth precipitator dust — мартенівський пил, 20. coke breeze — коксин, 21. carbonaceous

materials — матеріали, що містять вуглець, 22. sinter mix limestone fines — агломераційна вапняку, 23. to place on the sinter strand — завантажувати на загружать на аглострічку, 24. to straddle the bed — розташовуватись над шихтою, 25. to be drawn through — просисатися крізь, 26. to produce the bonded, cellular structure — утворювати сполучену, пористу структуру, 27. sensible heat — акумульоване тепло, 28. quiescent — нерухомий (статичний), 29. clinker — спечений матеріал, шлак, 30. zone of sinter — зона агломерату, 31. calcination zone — зона обжигу, 32. dry and preheat zone — зона сушіння і підігріву, 33. to volatilize — вилучати, 34. physical breakdown — фізичне руйнування, 35. wet zone — зона сирої шихти, 36. sensible heat — акумульоване тепло.

Task 4. Guess the meaning of the words and word combinations in italics from the context.

1. In the ferrous industry, the essential materials for sintering consist of a mixture of *iron-bearing fines*, fluxes and a solid, *particulated* fuel.

2. A temperature distribution exists through the *bed* such that a series of physically and chemically separate zones are formed.

3. The surface of the bed is heated to about 2500 °F, combustion of the fuel is *initiated.*

GRAMMAR EXERCISES

Task 5. Read the sentences and pick out conjunctions, prepositions and inflexions.

1. The principle of agglomerating by partial fusion has been known for centuries. 2. The incoming air quenches and solidifies the rear edge of the advancing fusion zone. 3. Physically, some of the larger particles are crocked by thermal stresses and some micropellets. 4. This lowest portion of the bed has essentially the same characteristics as the original mix.

Task 6. Read the sentences and determine the grammatical form of the words in italics taking into account inflexions.

1. In the ferrous industry, the essential *materials* for sintering *consist* of a mixture of iron-bearing *fines*, *fluxes* and a solid particulated fuel. 2. The high temperature zone of combustion and fusion *moves* downwardly through the bed and *produces* the bonded, cellular structure of the sinter. 3. Physical and chemical *changes occurred* just after solidification such as the oxidation of magnetite to hematite and grain growth of *crystals of* iron oxides.

Task 7. Read sentences and determine which of the words in italics are nouns, adjectives, verbs or adverbs.

1. Almost all iron ores required *concentration.* 2. The ore concentrate is a *powdery* material, *unsuitable* for blast furnace *smelting.* 3. The product has a *porous structure, resembling* a «clinker» in *physical* appearance, and its mineralogy may be *substantially* different from that of the original iron-bearing fines.

Task 8. By means of conjunctions and conjunctive words state whether a subordinate clause relates to its main clause as an object, attributive or an adverbial clause.

1. Natural raw materials can't ensure requirements, *so* they need the intensive burden preparation. 2. *As* air is drawn through the bed, the high temperature zone of combustion and fusion moves downwardly through the bed. 3. One should bear in mind *that* the principle of agglomerating by partial fusion has been known for centuries. 4. Sintering may be defined as a process in *which* iron-bearing materials of a fine particle size are converted into coarse agglomerates by partial fusion.

WORK WITH THE TEXT

LEXICAL EXERCISES

Task 9. Insert words and word combinations from the text.

1. Almost all iron ores (вимагають) concentration. 2. (Залізорудний концентрат) is (порошкоподібний горохуватий матеріал), unsuitable for blast furnace smelting. 3. Two agglomeration methods are generally used: (агломерація, огрудкування). 4. Sintering is presently (домінуючий процес) while pelletizing is (метод, що знаходиться в процесі розвитку). 5. Sintering may be defined as a process in which (залізовмісні матеріали з частками малих розмірів) are converted into (крупний агломерат) by partial (плавлення).

Task 10. Find in the text English equivalents of the following Russian sentences.

1. Агломерація на даний момент є домінуючим процесом, в той час як огрудкування – процес, що знаходиться в стадії розвитку. 2. Агломерацію можна визначити як процес, при якому завдяки частковому плавленню залізовмісні матеріали з частками малих розмірів перетворюються в крупний агломерат. 3. Горіння починається запалом палива в шихті за рахунок витягу над поверхнею шару горна. 4. В чорній металургії основні матеріали для агломерації складаються із суміші залізовмісного дріб’язку, флюсів і твердого здрібненого палива. 6. Саме в зоні горіння і плавлення окислення вуглецю до окису вуглецю та двоокису вуглецю забезпечує значну кількість тепла для утворення шлаку і плавлення часток залізної руди.

ASSIGNMENTS
(Check up your comprehension, of the text)

Task 11. Try to complete the sentences listed below by a suitable variant.

1. In sintering a shallow bed of fine particles is agglomerated by ...
   a) combustion of a solid fuel admixed with the bed of fines;
   b) igniting the fuel exposed at the surface of the bed;
   c) heat exchange and partial fusion of the quiescent mass.
2. During the process the induced air is ...
   a) cooled;
   b) transferred to the bed below the fusion zone;
   c) preheated by the hot sinter overlying the combustion and fusion zones.
3. As air is drawn through the bed, the high temperature zone of combustion and fusion moves ...
   a) upwardly;
   b) through the bed in the direction of the bottom;
   c) downwardly through the bed and produces the bonded, cellular structure of the sinter.

Task 12. Point out which of the sentences below contains the information related to the text.

1. The control of moisture is of utmost importance in balling. 2. The optimum size of moisture varies with the particular concentrate. 3. The moisture level of the upper part of this zone may be raised by the condensation of moisture removed from the previous zones. 4. Within this zone, the charge has been heated sufficiently to volatize free moisture.

Task 13. Look through the paragraphs of the text again and choose out of the titles the most suitable one.

Paragraph 1
   1. The predominant process.
   2. The definition of sintering.
   3. The ore concentrate.

Paragraph 2
   1. The formation of a semi-liquid slag.
   2. The role of heat exchange and partial fusion.
   3. The combustion of a solid fuel admixed with the bed of fines.

Paragraph 3
   1. The essential materials for sintering.
   2. Coke-breeze.
   3. Iron-bearing constituents.

Paragraph 4

1. The description of a series of separate zones.
2. Combustion of the fuel.
3. A temperature distribution.

Task 14. React to the wrong statements making use of the following expressions.

I'm not sure; I don't agree with you; I'm afraid you are wrong (mistaken); on the contrary; I don't think so; It is far from it; in my opinion.

In my opinion the ore concentrate is a solid material, suitable for blast furnace smelting.

— It is far from true ...

I think that it is suitable for blast furnace smelting. ч

— I'm afraid you are mistaken ...

To my mind sintering is presently a developing method.

— Where did you get that idea from? ...

I was told that before charging into the blast furnace the powdery material had to be agglomerated into lumps. Am I to understand you that iron-bearing materials of a fine particle size are converted into small agglomerates by partial fusion?

— Nothing of the kind ...

Task 15. Look through the text again and single out introductory, main and concluding parts.

EXERCISES IN PRECIS WRITING

Task 1. Read the text and find proper answers to the questions listed below.

1. How many competitive methods of agglomeration are there in the iron-making industry? 2. What are those competitive methods? 3. What method remains the predominant process of agglomeration of iron-bearing materials? 4. What method has replaced sintering to a certain extent lately? 5. Do you think the use of the pelletizing process for the agglomeration of fine iron ore concentrates is now well established? 6. What feed has proven to be an excellent blast-furnace feed? 7. What feed is highly resistant to physical breakdown?

Task 2. Read paragraphs 1, 2. Find English equivalents of the following Ukrainian sentences.

1. Агломерація була і залишається домінуючим процесом кускування залізовмісних матеріалів. 2. Існують два конкуруючих способи агломерації в чорній металургії агломерація і огрудкування. 3. Окатиші мають високий опір фізичному руйнуванню, витримкою на відкритому повітрі (площі). 4. Однак

досвід роботи доменної печі показав, що окатишам розміром від $^{3}/_{8}$ дюйми до $^{1}/_{2}$ дюйми сьогодні віддають більше переваги.

Task 3. Read paragraph 3. State:

1. what is necessary to produce in making satisfactory pellets; 2. what the quality of the final pellet is related to; 3. what characteristics the green balls must have; 4. the number of phases in green ball formation.

Task 4. Suggest a suitable title for each paragraph so as to have a detailed plan.

Model:

1. The use of the pelletizing process for the agglomeration of fine iron ore concentrates.
2. Pellets have proven to be an excellent blast furnace feed.
3. Production of pellets.

Give your own variant.

Task 5. Express the basic ideas of the introductory, main and concluding parts.

Task 6. Express the basic idea of the text.

Task 7. Write a precis of the text in Ukrainian. It should not exceed one third of the text.

ASSIGNMENTS

Task 8. Read paragraph 1. State:

1. the importance of the method of feed preparation in forming balls in the pelletizing process;
2. types of equipment for forming balls;
3. whether the balling drum is still the most widely used;
4. what variables have an effect on the size of the ball produced;
5. whether a balling cone and a balling disc are simpler devices than a balling drum.

Task 9. Read paragraph 2. State:

1. what the grate machine is;
2. what it resembles in appearance;
3. the main improvement in the latest grate machines.

Text

1. The method of feed preparation and the apparatus used in forming balls are of major importance in the pelletizing process. The three types of equipment in general use for forming balls are: 1) balling drum; 2) balling cone; 3.) balling disc.

Feed preparation is usually independent of the type of balling equipment used. Almost invariably it consists of a fine concentrate.

The balling drum was the original apparatus developed for the formation of green balls and is still the most widely used. It consists basically of a cylindrical rotating drum mounted on rollers. The drum is sloped towards the discharge end. A reciprocating cutterbar provided with relatively narrow cutting teeth and operating at about 50 strokes per minute maintains the contour.

Certain variables have an effect on the size of the ball produced. For example, an increase in moisture of the feed tends to make larger balls, an increase in the slope of the drum tends to produce smaller balls.

In a balling drum, the minimum size of the ball produced is controlled by a trammel or vibrating screen. The undersize is transported back to the head end of the drum and reintroduced with the new feed.

A balling cone and a balling disc are somewhat simpler devices than a balling drum, but the balling drum tends to produce a more uniformly sized product and is used much more often.

2. The most common type of pelletizing furnace for agglomerating magnetite concentrates is the grate machine. The use of the grate machine has come into considerable prominence as a means of indurating green balls. In appearance it resembles a sintering machine and in its earliest form, was almost identical in principle and in operation. However, as progress has been made, the design has changed considerably. Heat was originally supplied by carbon mixed in or on the surface of the pellets. As development progressed, the use of solid carbon has been eliminated in most cases and the heat is now supplied by indurating chambers mounted above the grate starting a short distance from the feed end. For some of the grate machines, the green balls are transferred to coal-coating drums in which a small amount of coal fines is rolled onto the surface of the ball. After a preparatory screening step the balls are deposited on the grate. In new machines updraft drying is used in some of the first windboxes. A completely hooded combustion area, which includes the downdraft, preheating and ignition zones, permits precise control over temperature and gas requirements. Gas temperatures in the ignition zone are maintained at approximately 2200 °F.

One main improvement in the latest grate machines is in the manner of cooling the pellets. In the new design, after the wind- box where the charge is substantially burned through to the grate, the cooling air is reversed from downdraft to updraft. This air is then used to furnish heat for the primary updraft drying zone in windboxes 1 to 5.

TEST EXERCISES

Task 10. Look through paragraph 2 of the text «Pelletizing» and find an English equivalent of the following Ukrainian sentence.

Деякі експерименти і досвід експлуатації доменних печей показали, що певні типи окатишів руйнуються в печі до того, як вони досягнуть зони плавлення.

Task 11. Read the sentences and pick out structural words, form- words and determiners.

1. The bonding is effected by a combination of fusion and grain growth. 2. In the ferrous industry, the essential materials for sintering consist of a mixture of iron-bearing fines, fluxes, and a solid, particulated fuel. 3. Within this narrow zone, the surfaces of adjacent particles reach fusion temperature, and gangue constituents form a semi-liquid slag.

Task 12. By means of prepositions, inflexions, determiners, word- building elements and the place of the word in a sentence state to what part of speech (or non-finite form of the verb) the words belong.

1. Pellets are highly resistant to physical breakdown caused by exposure to weather. 2. Variations in moisture affect the size of the balls formed and their quality.

Task 13. On the basis of word order, inflexions, structural words (prepositions) and form-words single out the subject (the subject group), the predicate (the predicate group), then find an object (an object group) and an adverbial modifier.

1. After a preparatory screening step the balls are deposited, on the grate. 2. Pellets have sufficient structural strength. 3. Within this narrow zone, the surfaces of adjacent particles reach fusion temperature., 4. In the ferrous industry, the essential materials for sintering consist of a mixture of iron-bearing fines, fluxes, and a solid, particulated fuel.

Task 14. By means of conjunctions and conjunctive words determine whether a subordinate clause relates to its main clause as an object, attributive or an adverbial clause.

1. Blast-furnace experience has shown that pellets in the size range of $^{3}/_{8}$ to $1/_{2}$ are preferable. 2. A good green ball must also have properties which will permit-it to be heated from its cold moist state. 3. Nuclei formation takes place when water- coated particles have sufficient attractive force to bind them together.

Task 15. Read the text to yourself within a minute and find out which aspect of iron ore industry it deals with.

ONE OF THE LARGEST BLAST FURNACES IN THE WORLD

One of the largest blast furnaces with a volume of 5000 cu metre and a capacity of 4 million tonne of iron/year was put into operation in Kryvyi Rih in 1974. Labour productivity at the Kryvyi Rihg blast furnace is 30 per cent higher than a 3200 cu metre furnace. The USSR's industrial development program includes boosting the efficiency of equipment through enhanced unit capacities of new facilities. The stoves ensure the blowing of the furnace at a temperature up to 1450 °C, which is 200 to 300 degrees higher than ordinary furnaces. An original charging device using hydraulics augments span of service and makes it possible to conduct repair work without stopping production. The blast furnace has no ore yard. The materials are supplied by two belt conveyors about 1500 metres long.

The Kryvyi Rih blast furnace is highly automated with the smelting process controlled by means of computers.

The cast house is equipped with a ventilation system to supply fresh air as required.

Task 16. Read the text within three minutes and make up a short outline of it.

BLAST FURNACE IS LOCATED NEAR ARCTIC CIRCLE

The Swedish blast furnace is operated at Norbottens Sarnverk AB plant in Zulea, 100 kilometers (62 miles) south of the Arctic Circle. The furnace was built by Demag AG of Duisburg, West Germany.

With a hearth dia of 8.5 metres (28 ft) and a furnace volume of 1700 cu metres the furnace has a daily capacity of 3000 tons or approximately 1 million tonnes of pig iron annually. The furnace operates with a top pressure of 1,5 atm.

The furnace cooling water system is a closed circuit, and a water treatment plant was provided to prevent pollution.

Coarse filtering of top gas is done by a dust collector which has a dia of 10.6 metres (35 ft). Special considerations had to be made for operation of the furnace under Arctic conditions. The furnace itself and the three hot blast stoves are completely enclosed to prevent the adverse effects of extreme low temperatures.

All data concerning measurements and control of the blast furnace are collected in a central station. A comprehensive picture of furnace operating conditions can be obtained at any time from the instrument panels at this station.

PRELIMINARY WORK WITH THE TEXT LEXICAL EXERCISES

Task 16. Listen to the following words and word combinations. Memorize them.

1. principal unit — основний агрегат, 2. vertical shaft — вертикальна шахта, 3. iron ore and carbon entering at the top — подача залізної руди і коксу в верхню

частину, 4. to emerge — з'являтися, 5. calculation of furnace lines — розрахунки профілю печі, 6. improvement — вдосконалення, 7. main dimensions — основні елементи, 8. hearth diameter — діаметр горну, 9. bosh — заплечики, 10. top — колошник, 11. height of hearth — висота горну, 12. vertical section — розпар, 13. sloped inwall — скісна шахта, 14. working height (centerline of tuyeres tostockline) – робоча висота (відстань від осі фурми до рівня засипу), 15. volume — об'єм, 16. subhearth — лещадь, 17. to rest directly on a steel-reinforced foundation — спиратися безпосередньо на залізобетонний фундамент, 18. pad — бетонна подушка, 19. mantle of the furnace — мараторне кільце печі, 20. shell of the stack — кожух шахти, 21. super structure — колошникове обладнання, 22.crucible — металоприймач, 23. water cooling — водяне охолодження, 24. clay brick — вогнетривка цегла, 25. to incase in a steel hearth jacket - укладати в стальних кожух, 26. cast iron water-cooled staves — литі чавунні водо-охолоджувальні холодильники, 27. iron notch — чавунна льотка, 28. the hearth cooling stave — водо-охолоджуваний холодильник горну, 29. to fit and hold — щільно входити й утримувати, 30. water-cooled casting (the «monkey») — водо-охолоджуване відливання, 31. hearth jacket — кожух горну, 32. tuyere jacket — кожух фурменої зони, 33. tuyere openings — амбразури повітряних фурм, 34. fireclay brick — вогнетривка цегла, 35. erosion of the brick — руйнування вогнетривкої цегли, 36. friction — тертя, 37. to enhance the dawnward movement of the burden — полегшити спускання шихти, 38. impact — руйнування, 39. hopper — воронка, 40. conical bell — конус, 41. offtake main — газовідвід, 42. adjacent to the hopper — прилеглий до запасного апарату, 43. elevated top pressure — підвищений тиск на колошнику.

Task 17. Guess the meaning of the words and word combinations in italics from the context.

1. Various blast-furnace *authorities* may differ in their opinion about the design of the furnace. 2. Just inside this *jacket* are cast iron water cooled *staves.* 3. It is still vertical *shaft,* with iron ore and carbon entering at the top, air blown in below, and molten iron *emerging* periodically from the bottom.

GRAMMAR EXERCISES

Task 18. Read the sentences and pick out conjunctions (conjunctive words), prepositions, inflexions, determiners and form-words.

Model:

In the area of the iron notch specially shaped castings are used that leave an opening large enough for the tap hole.— (in, the, of, the, -s, are, that, an, for, the)

A smaller intermediate cooler fits into this and holds a small water cooled casting through which the slag is withdrawn from the furnace.

Task 19. Read sentences and determine the grammatical form of the words in italics taking into account inflexions.

Model:

It consists of a subhearth usually from 10—15 feet thick made up of several layers of ceramic bottom block.

(consists — the third person singular of the verb; layers — the plural form of the noun)

1. The *sidewalls* above the floor of the hearth are two — three feet thick. 2. Just inside this jacket are cast iron water *cooled staves.*

Task 20. Taking into account form-words and inflexions prove that the words and word combinations given below are predicates in the active or passive voice.

1. are columns; 2. shows; 3. consists; 4. are extended; 5. is used; 6. made; 7. will fit; 8. is penetrating; 9. surrounded; 10. may differ.

Task 21. Read sentences and determine which of the words in italics are nouns, adjectives, verbs or adverbs taking into account word- building elements.

1. The typical *construction* in America is for the subhearth to rest *directly* on a steel-reinforced concrete *foundation.* 2. All calculations of furnace lines are not well-grounded *theoretically.* 3. *Generally* when a new furnace is built, the design of an older furnace is *modified* to incorporate improvements that appeared to be *desirable* from the results of *operating* former furnaces, 4. But there is never an *extremely* radical change from the *original basic* design. 5. Undercooling is used to keep the carbon from *reacting* with the hot metal.

Task 22. By means of conjunctions and conjunctive words state whether a subordinate clause of a complex sentence relates to its main clause as an object, attributive or an adverbial clause.

1. Clay brick is seldom used in the hearth sidewalls today because of their high solution rate in the slag. 2. He said that the openings for the tuyeres were protected by large annular coolers. 3. The design of an older furnace is modified to incorporate improvements that appeared to be desirable.

BLAST FURNACE DESIGN, CONSTRUCTION AND EQUIPMENT

1. The blast furnace has been the principal unit for the production of hot metal from iron ore for over 600 years. Since that time the furnace has not been changed in the main. It is still a vertical shaft, with iron ore and carbon entering at the top, air blown in below, and molten iron emerging periodically from the bottom.

2. The main dimensions of the furnace lines are: hearth diameter, bosh diameter, top diameter, height of hearth; height of bosh, height of vertical section; height of sloped inwall; hearth bottom to iron notch and iron notch to cinder notch, working height (centerline of tuyeres to stockline), working volume.

The typical construction is for the subhearth to rest directly on a steel-reinforced concrete foundation. Resting on this same concrete pad are columns that support the mantle of the furnace which in turn supports the shell of the stack and the entire super structure.

The crucible at the bottom of the furnace consists of a sub- hearth usually from 10—15 feet thick made up of several layers of ceramic bottom block. The sidewalls above the floor of the hearth are 2—3 ft thick. Hearth sidewalls are now generally carbon. These may be of block and / or brick construction. Because of the high thermal conductivity of carbon, water cooling is very effective in extending - the life of the carbon hearth. Clay brick is seldom used in the hearth sidewalls today because of their high solution rate in the slag.

The entire crucible is encased in a steel hearth jacket about 1—$^1/_2$" thick. Just inside this jacket are cast iron water cooled staves. In the area of the Iron notch specially shaped castings are used that leave an opening large enough for the tap hole.

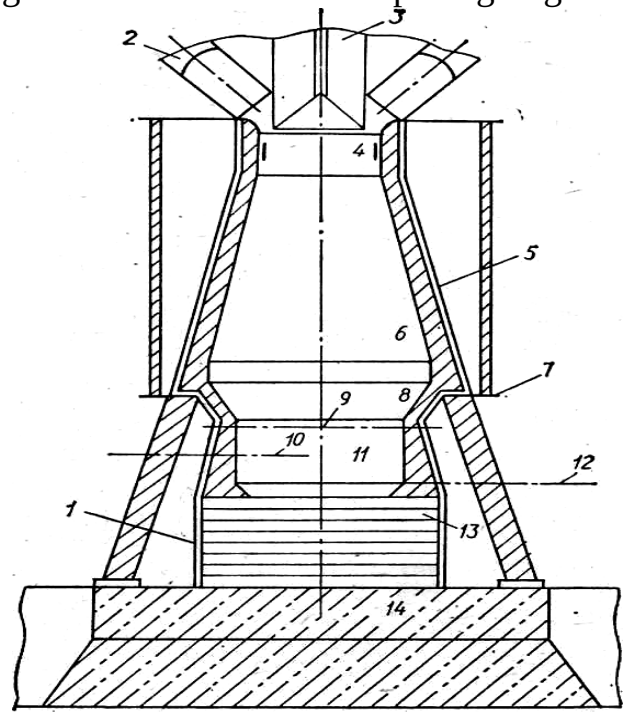


Fig. 1. The main dimensions of the furnace lines Основні елементи профілю печі
1 — steel hearth jacket — стальний кожух горна; *2* — offtake main — газовідвід; *3* — super structure — колошникове обладнання; *4* — top — колошник; *5* — shell — кожух; *6* — shaft — шахта; *7* — mantle — мараторне кільце; *8* — bosh — заплечики; *9* — tuyere — фурма; *10* — cinder notch — шлакова льотка; *11* — hearth — горн; *12* — iron notch — чавунна льотка; *13* — subhearth (plug) — лещадь; *14* — steel reinforced concrete foundation — залізобетонний фундамент.

In a few instances in America as well as in Europe, the entire hearth is made of carbon, and undercooling is used to keep the carbon from reacting with the hot metal.

3. The slag notch is sometimes at a level above the top of the hearth cooling staves. If not, a special short stave is used in the slag notch location. The opening through the hearth wall is protected by a large conical cooler. A smaller intermediate

cooler fits into this and holds a small water cooled casting through which the slag is withdrawn from the furnace. This small

water-cooled casting that extends into the furnace is called the «monkey». The assembly of the three cooling members, which are generally made of copper, is shown in the figure.

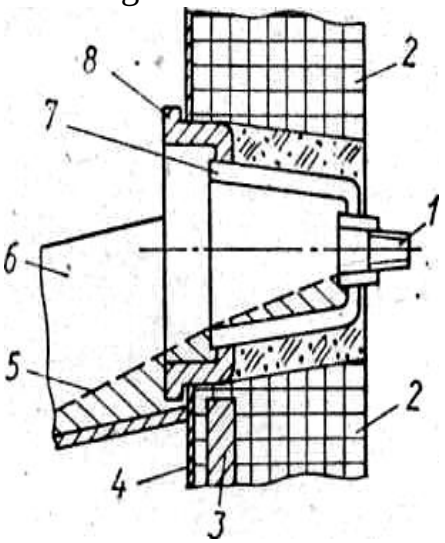


Fig. 2. Slag notch construction Конструкція шлакової льотки

1 — slag notch — шлаковая льотка; *2* — firebrick — вогнетривка кладка; *3* — hearth stave — плитковий холодильник горну; *4* — hearth jacket — кожух горну; *5* — runner lifting — футеровка жолобу; *6* — slag runner — шлаковий жолоб; *7* — slag notch cooler — холодильник шлакової льотки**;** *8* — cooler holder — амбразура (шлакової льотки).

4. Above the hearth jacket is the tuyere jacket, housing the portion of the hearth penetrated by the tuyere openings.

Many furnaces use carbon brick to the top of the tuyere breast and ceramic brick above that level, however, in some furnaces the carbon brick extends to the top of the bosh.

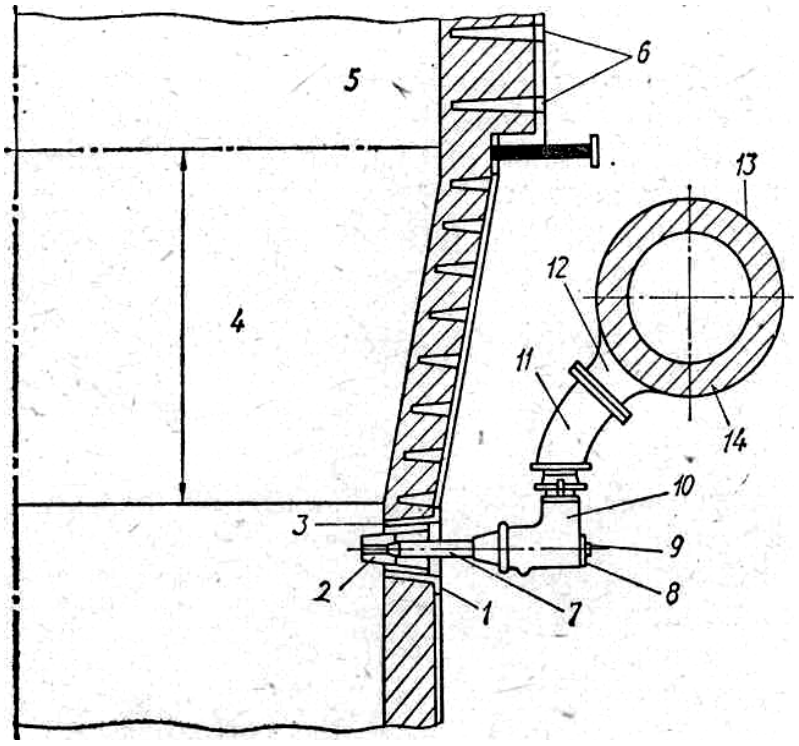


Fig. 3. Section through tuyere opening Розріз по осі повітряної фурми

1— annular cooler — амбразура повітряної льотки; *2* — tuyere — повітряна фурма; 3 — tuyere cooler casting — холодильник повітряної фурми; *4* — bosh —

заплечики; *5* — top of mantle — верхній зріз мараторного кільця; *6* — stack-cooling plate — холодильники шахти; *7* — blowpipe — сопло; *8* — tuyere cap — заслінка гляділки; *9* — peep sight — гляділка: *10* — tuyere stock — подвижное колено; *11* — goose neck — рухоме коліно; *12* — neck — патрубок на кільцевому повітропроводі; *13* — bustle pipe — кільцевий повітропровід; *14* — refractory lining — вогнетривка футеровка.

The openings for the tuyeres are protected by large annular coolers and these coolers are often surrounded with arches of fireclay brick. When the lining of the bosh is made of ceramic, copper cooling plates are used that extend through the entire thickness of the lining. In some blast furnaces the bosh and the lower portion of stock is cooled with water-cooled cast iron staves.

In most of the modern furnaces water-cooled plates are placed in the lining of the stack for at least $^{3}/_{4}$ of the height to decrease erosion of the brick and to help to maintain the original furnace lines. The furnace lining above the bosh is called the inwall. The inwall -is sloped to reduce the friction between the burden and the inwall and thus to enhance the downward movement of the burden. The materials to be charged are dumped into the furnace by lowering a conical bell.

The gas is removed from the furnace by offtake mains through openings in the conical section adjacent to the hopper. To ensure that the gas goes out through these offtakes when the large bell is opened, a second smaller bell is provided which remains closed when the large bell is opened. Some furnaces are provided with two small bells so that the large bell hopper can be pressurized at all times.

To distribute the materials uniformly around the periphery of the furnace, the small bell hopper is rotated before it is discharged into the large bell hopper.

For this purpose most furnaces use a McKee revolving distributor.

WORK WITH THE TEXT

LEXICAL EXERCISES

Task 23. Insert words and word combinations from the text.

1. The blast furnace (є основним агрегатом) for the production of hot metal from iron ore for over 600 years. 2. Since that time the furnace (не змінилася в головному). 3. It is still (вертикальна шахта) with (з подачею залізної руди і коксу у верхню частину) air blown in below, and (рідкий чавун) emerging periodically from the bottom. 4. All (розрахунки профілю печі) are not well-grounded theoretically. 5. The crucible at the bottom of the furnace consists of (лещаді) usually from 10 to 15 feet thick (вимощеної з кількох рядів керамічних блоків).

Task 24. Find in the text English equivalents of the following Russian sentences.

1. Понад 600 років доменна піч є основним агрегатом для виробництва розплавленого металу залізної руди. 2. Отвір в стінці горну захищається великим

конічним холодильником. 3. Цей невеликий водо-охолоджуваний відливок, який висунутий в піч, зветься шлаковою фурмою (на американському виробничому жаргоні зветься «мавпою»). 4. Вище кожуха горну розташований кожух фурменої зони, який є частиною горну, крізь яку просякають амбразури повітряних фурм. 5. Коли кладка заплечиків виготовляється із керамічних вогнетривів, застосовують мідні водо-охолоджувані плиткові (ребристі) холодильники, які проникають на всю товщину кладки.

ASSIGNMENTS
(Check up your comprehension of the text)

Task 25. Try to complete the sentences listed below by a suitable variant. Give reason for your choice.

1. The typical construction in America is for the subhearth to rest ...
   a) on columns;
   b) on the shell of the stack;
   c) directly on a steel-reinforced concrete foundation.
2. Clay brick is seldom used in the hearth sidewalls because of ... .
   a) the high thermal conductivity;
   b) their high solution rate in the slag;
   c) reacting with the hot metal.
3. The opening through the hearth wall is protected by ...
   a) water cooled casting;
   b) by a large conical cooler;
   c) slag notch cooler.

Task 26. Point out which of the sentences below contains the information related to the text.

1. Since 1974 the Soviet Union has been mainly building blast furnaces with a net volume of 3000 to 5000 and over cu metre. 2. No. 9 large capacity blast furnace was started up at the Kryvyi Rih plant. It was blown-in in 1974. 3. As the newspaper «Pravda» reported a new large capacity blast furnace with an internal volume of 5.580 cu metre is under construction in Cherepovets. It will be one of the world's largest. 4. As «Iron- making and Steelmaking», a joint publication of the «Metals Society and the American Society for Metals», reported in November 1973 No. 5 blast furnace, Fukuyama Works, with an internal volume of 4.617 cu metre was blown-in. 5. In a few instances in America as well as in Europe, the entire hearth is made of carbon, and undercooling is used to keep the carbon from reacting with the hot metal.

27. Look through the paragraphs of the text again and choose out of the titles the most suitable one.

Paragraph 1

a. The blast furnace is the principal unit for the production of hot metal from iron ore.

b. The blast furnace is a vertical shaft.
c. The blast furnace has not been changed in the main.

Paragraph 2

a. The main dimensions of the furnace lines.
b. The typical construction in America.
c. The construction of the crucible.

Paragraph 3

a. The slag notch construction.
b. The hearth jacket.
c. The slag notch cooler.

Paragraph 4

a. The tuyere opening.
b. The bosh.
c. The tuyere opening and bosh.

Task 27. React to the wrong statements using introductory word combinations. Make appropriate corrections by adding the statements which correspond to the contents of the text.

1. Do you mean that it is a vertical shaft, with iron ore and carbon entering at the bottom, air blown in below, and molten iron emerging periodically from the bottom?

— It would be wrong to say so. ...

2. In my opinion in modern blast furnaces air is heated regeneratively in stoves to the temperature 800 °C.

— I can't agree with you, ...

3. I think that various blast furnace authorities do not differ in their opinion about the design of the furnace.

— You are wrong, ...

4. Am I to understand that the design of the furnace is based on theoretical foundation?

— Just the reverse, ...

5. To my mind all calculations of furnace lines are well-grounded theoretically. -

— I don't think so. ...

6. I'm afraid of being wrong but I am of the opinion that there is an extremely radical change in the design of the furnace from the original basic one.

— You are not exact in your meditations on this point in question. ...

Task 28. Look through the text again and single out introductory, main and concluding parts.

Model:

(The introductory part)

Generally when a new furnace is built, the design of an older furnace is modified to incorporate improvements that appeared to be desirable from the results of operating former furnaces, but there is never an extremely radical change from the original basic design.

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