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АНГЛІЙСЬКА МОВА ДЛЯ ТЕХНІЧНИХ СПЕЦІАЛЬНОСТЕЙ

Навчально-методичний посібник

Частина 2

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Навчально-методичний посібник з англійської мови призначений для роботи як в аудиторії, так і для самостійного опрацювання курсантами технічних спеціальностей. Посібник укладено згідно з вимогами навчальної програми дисципліни «Іноземна мова (за професійним спрямуванням)», він охоплює необхідний базовий лексичний мінімум.

Структура посібника відповідає навчальній програмі та послідовності викладання дисципліни у практичному курсі. Він може використовуватися курсантами й працівниками льотного та інженерно-технічного складу Повітряних сил Збройних Сил України.

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UNIT 11. THE MECHANIC'S DUTIES. YOU ARE WHAT YOU THINK YOU ARE

Exercise 11.1. Read the text below. Translate it.

The best students

According to most professors, mature students are (1)_____ ideal students because they are hardworking and become actively (2)_____ in all aspects of the learning process. The majority of mature students have a poor educational background but they (3) _____ to do exceptionally well at tertiary level. (4)_____ many of them have a mortgage, a job and children to (5)_____, they are always present at seminars and lectures and always hand (6)_____ essays on time. They (7)_____ studying and writing essays and they enjoy the class discussions that take place. Consequently, they (8) _____ excellent results. In fact, as they have (9)_____ many of life's pleasures, they are content with their lives and this has a positive (10)_____ on their attitude, making them (11) _____ to learn. On the other hand, despite their enthusiasm and commitment, mature students (12)_____ from anxiety. The fact that they have made many sacrifices to (13)_____ into university puts extra pressure on them to succeed. (14) _____, completing a degree gives mature students a sense of achievement, boosts their confidence and (15) _____ their job prospects.

№	A	B	C	D
1	first	ideal	special	best
2	included	related	involved	combined
3	able	succeed	manage	capable
4	Although	Despite	However	In spite of
5	grow	develop	rise	raise
6	in	over	out	up
7	dislike	give	like	hate
8	fulfill	achieve	reach	earn
9	known	experienced	found out	recognized
10	effect	affect	conclusion	consequence
11	eager	anxious	interested	impatient
12	tolerate	resist	suffer	complain
13	leave	get	go	enter
14	Likewise	Furthermore	Nevertheless	Otherwise
15	creates	improves	progresses	advances

Exercise 11.2. Choose the synonym for the word in bold

1. imagine A. decide B. guess C. see D. speak	2. profit A. benefit B. loss C. damage D. book	3. compose A. read B. translate C. make up D. learn	4. assist A. send B. want C. help D. cut
--	---	--	---

5. except A. including B. opposite C. and D. beside	6. afraid A. shake B. kneel C. scared D. stretch	7. extraordinary A. usual B. popular C. unusual D. dull	8. solution A. spelling B. reason C. question D. decision
--	---	--	--

APPEARANCE AND CHARACTER

What **traits** in people's **character** do you **appreciate** most and which of them are most important for you? Does person's **appearance has something to do with** his character? Here **is** no doubt that they are **interconnected**.

When we speak about somebody's face, figure, hands, feet we mean his or her appearance. A face may be oval, round, square, broad, **sensual** or worried. **Features** may be regular or irregular, a figure – athletic, **graceful**, **slim** or **clumsy** and plump. A person may be tall, middle-sized or short and, in general, appearance is **agreeable**, **winsome** and **gentle** or **plain-looking** and **ugly**.

Speaking about somebody's character we can characterize person as **affable**, **amiable**, **good-natured**, **kind-hearted**, sociable, **generous**, **thoughtful**, discreet, **earnest** or **on the contrary**, hard-hearted, **ill-natured**, **reserved**, uncommunicative, indiscreet, insincere, insensible, **rude**, **greedy**, **dashing**, showy and tactless.

GRAMMAR

Особливості модальних дієслів

До модальних дієслів належать: **can**, **may**, **must**. Ці дієслова означають не саму дію, а лише *ставлення до неї мовця*. Вони вживаються в сполученні з інфінітивом іншого дієслова.

Модальні дієслова мають деякі **особливості**:

1. Не змінюються ні за особами, ні за числами.
2. Не мають форм інфінітива, герундія, дієприкметника, а тому не мають складних часових форм – майбутнього часу, тривалих і перфектних часів.
3. Після них інфінітив вживається без частки *to* (за винятком дієслів *have be ought*):

She may arrive tomorrow. – Можливо, вона приїде завтра.

4. Не мають закінчення – (e)s у третій особі однини *the Present Indefinite*.

5. Утворюють питальну і заперечну форми без допоміжного дієслова. У питальній формі модальне дієслово ставиться перед підметом:

May I come in? – Можна увійти?

Can you translate the article? – Ви можете перекласти статтю?

Дієслово **can (could)**

1. Дієслово **can** вживається для вираження:

а) можливості:

I can run fast. – Я можу швидко бігати.

б) уміння:

I can speak English. – Я можу (вмію) говорити англійською мовою.

в) прохання:

Can you come to my place? – Ти можеш прийти до мене?

г) пропозиції послуг:

Can I help you with this translation? – Я можу допомогти тобі з цим перекладом?

Стверджувальна	Питальна	Заперечна
I (you, he, she, it, we, they) can do it.	Can I (you, he, she, it, we, they) do it?	I (you, he, she, it, we, they) cannot (can't) do it.

2. Дієслово **could** вживається для вираження:

а) можливості в минулому:

I could run fast when I was young. – Я міг швидко бігати, коли був молодим.

б) ввічливого прохання:

Could you help me with the translation of this text? – Ви не могли б мені допомогти з перекладом цього тексту?

в) узгодження часів:

He said they could not (couldn't) come. – Він сказав, вони не можуть прийти.

Стверджувальна	Питальна	Заперечна
I (you, he, she, it, we, they) could do it.	Could I (you, he, she, it, we, they) do it?	I (you, he, she, it, we, they) could not (couldn't) do it.

1. Разом з модальним дієсловом **can** вживається сполучення **to be able to**.

Порівняйте:

can	be able to
I can do it. – Я можу це зробити.	I'm able to do it. – Я можу це зробити (в змозі).
I could do it. – Я міг це зробити.	I was able to do it. – Я зміг це зробити.
I can do it tomorrow. – Я можу це зробити завтра.	I'll be able to do it tomorrow. – Я зможу це зробити завтра.

Дієслово **may (might)**

1. Дієслово **may** в сполученні з інфінітивом основного дієслова вживається:

а) для вираження формального дозволу або прохання:

You may open the window. – Ти можеш відчинити вікно. (Тобі дозволяють відчинити вікно.)

May I come in? – Можна увійти? (Дозвольте увійти?)

You may stay with us. – Ви можете залишитися з нами.

I can open the window, but I may not do it. – Я можу відчинити вікно, але мені не дозволяють цього робити.

б) для вираження ймовірності:

He may coach them now. – Він можливо тренує їх зараз.

в) для вираження припущення щодо майбутніх подій:

It may snow at night. – Вночі, можливо, буде сніг.

The guests may come earlier. – Гості, можливо, прийдуть раніше.

г) для вираження побажання, надії:

May she be happy! – Щастя їй!

May you be lucky! – Щастя вам!

Стверджувальна	Питальна	Заперечна
I (you, he, she, it, we, they) may do it.	May I (you, he, she, it, we, they) do it?	I (you, he, she, it, we, they) may not do it.

2. Дієслово **may** вживається лише в теперішньому часі. Дозвіл або заборону стосовно дії у минулому або майбутньому часі можна виразити за допомогою словосполучень **to be allowed, to be permitted**:

We were allowed (permitted) to go home. – Нам дозволили йти додому.

He will be permitted to go to school tomorrow. – Йому дозволять йти до школи завтра.

3. Форма **might** у значенні минулого часу дійсного способу вживається в основному в підрядних реченнях відповідно до правила узгодження часів.

Стверджувальна	Питальна	Заперечна
I (you, he, she, it, we, they) might do it.	Might I (you, he, she, it, we, they) do it?	I (you, he, she, it, we, they) might not do it.

Дієслово **must**

1. Дієслово **must** виражає:

а) дію, необхідну з точки зору того, хто говорить, необхідність, обов'язок, наказ або категоричне прохання:

I must do this exercise. – Я повинен (мені потрібно) зробити цю вправу.

б) необхідність дії:

He must consult a doctor. – Йому потрібно порадитись із лікарем.

в) наказ:

You must translate the chapter before my sister comes. – Ви повинні перекласти главу до того, як прийде моя сестра.

г) категоричну заборону (у заперечних реченнях):

You must not go there. – Вам (тобі) не можна йти туди.

д) упевненість:

Look! It must be my sister. – Подивись! Це повинна бути моя сестра.

Стверджувальна	Питальна	Заперечна
I (you, he, she, it, we, they) must do it.	Must I (you, he, she, it, we, they) do it?	I (you, he, she, it, we, they) must not do it.

2. Оскільки **must** не має форми минулого і майбутнього часів, замість нього вживається дієслово **to have** у відповідних часових формах із наступним інфінітивом із часткою **to**.

Теперішній час	Минулий час	Майбутній час
must	had to	will have to
I must wait for him. – Я повинен (маю) на нього чекати.	I had to wait for him yesterday. – Учора я повинен був (мав) на нього чекати.	I will have to wait for him tomorrow. – Завтра я повинен буду (маю) на нього чекати.

3. Зверніть увагу на те, що в українській мові дієслово мати також може виражати необхідність, обов'язок:

Я маю (повинен) це зробити. – I must (have to) do it.

Я мав це зробити, але не зробив. — I had to do it, but I haven't done.

Дієслово **have to**

1. Дієслово **have to** виражає:

а) необхідність у зв'язку з обставинами:

I had to stay at home as I felt very bad. – Я повинен був залишитися вдома, тому що дуже погано себе почував.

б) відсутність необхідності:

They don't have to bring their dictionaries. – Їм не треба приносити словники.

Стверджувальна	Питальна	Заперечна
Present		
I (you, we, they) have to do it.	Do I (you, we, they) have to do it?	I (you, we, they) don't have to do it.
He (she, it) has to do it.	Does he (she, it) have to do it?	He (she, it) doesn't have to do it.
Past		
I (you, he, she, it, we, they) had to do it.	Did I (you, he, she, it, we, they) have to do it?	I (you, he, she, it, we, they) didn't have to do it.
Future		
I (you, he, she, it, we, they) will have to do it.	Will I (you, he, she, it, we, they) have to do it?	I (you, he, she, it, we, they) won't have to do it.

Прийменники місця (Prepositions of Place)

on	на	<i>The pencil-box is on the desk.</i>
In	в, на	<i>The books are in the schoolbag.</i>
At	у, в	<i>I study at school.</i>
Above	над	<i>The lamp is above the table.</i>
Under	під	<i>The cat is under the bench.</i>
Before (in front of)	перед	<i>He is sitting before (in front of) the pupils.</i>
Near	біля	<i>The bookcase is near the door.</i>
Between	між	<i>He sat between his two sisters.</i>
Among	серед	<i>The boy was standing among the girls.</i>
Across	через	<i>I live across the street.</i>

READING

Read and translate the text.

TEXT: «THE MECHANIC'S DUTIES»

Mechanics are responsible for installing and dismantling the components they produce either manually or with machines. They inspect the machines and technical systems on a regular basis and carry out any necessary maintenance and repair work. Their duties also include setting up, converting and commissioning production equipment, precision tool making and mechanical/plant/production engineering.

You should be technically minded, enjoy working in a team and be economically astute in your thinking and actions. Good grades in mathematics, physics and sport are also an advantage.

Aviation mechanic (aviation technician-mechanic, aircraft mechanic) is a specialist on repair and maintenance of aircraft and aircraft engines. His primary responsibility is the maintenance of aircraft and helicopters in the state of airworthiness. It identifies and fixes problems, conducting small repairs.



Airplane mechanics work in **three main directions**:

- avionics, engines and flight control system;
- air-conditioning systems and hydraulics;
- other systems (in particular, waste disposal).

Therefore, aviation mechanic is the name of an entire group of specialties.

Airplane mechanics in civil aviation:

- aviation mechanic (technician) airframe and engines;
- aviation mechanic (technician) on devices and electrical equipment;
- aviation mechanic (technician) for radio equipment.

Airplane mechanics in the armed forces (air force):

- aviation mechanic operation and repair airframe and propulsion systems of the aircraft;
- aviation mechanic operation and repair of aircraft armament;
- aviation mechanic operation and repair of radio engineering, radio electronic, radio and anti-submarine search and sighting equipment;
- aviation engineer on operation and repair of aviation equipment.

Airplane mechanics work in airports and repair shops, hangar and at the airfield.

Important quality

Aviation mechanic needs a good eye, a good ear, developed clearly effective and visual creative thinking, good memory, ability to concentrate attention, observation, and a fast response.

As well as discipline, patience, diligence, accuracy, physical endurance.

In some cases aviation mechanic has to work with chemicals, it is very important not to have allergic diseases.

Knowledge and skills

Aviation mechanic should know basic technical data and design of the aircraft it operates, understand their engines and principles of operation of main technical nodes. And rules of technical operation, documentation and technique of technical maintenance of cars, with which to work.

For example, he should know the technology for removing and installing the engine, the rules of installation and adjustment of the basic components, be aware of typical malfunctions. And of course, he should be able to correct these faults and carry out the adjustment.

Problems

Danger of injuries: bruises, fractures associated with falling of heavy objects, eye injuries, cuts and injury associated with weights.

In addition adversely affect health of noise and vibration, work-related tools, contact with chemicals.

WORD LIST

- 1. to install – встановлювати***
- 2. dismantling – демонтаж, розбірка***
- 3. to inspect – перевіряти***
- 4. regular base – регулярна база***
- 5. carry out – виконання, приводити в дію***

6. *duties* – обов'язки
7. *setting up* – наладка, збірка, регулювання, встановлення
8. *converting* – перетворення
9. *commissioning production equipment* – введення в експлуатацію виробничого обладнання
10. *precision tool making* – виготовлення точних приладів
11. *to embark* – вантажити
12. *apprenticeship* – навчання, період навчання
13. *to possess* – володіти
14. *relevant skills* – необхідні/важливі навички
15. *technically minded* – технічно підковані
16. *astute* – кмітливий
17. *responsibility* – відповідальність
18. *airworthiness* – придатність до експлуатації в польоті
19. *to identify* – виявити
20. *conduction small repairs* – проведення невеличких ремонтних робіт
21. *waste disposal* – захоронення відходів
22. *therefore* – отже, з цієї причини
23. *entire group* – повна група
24. *propulsion system* – силова установка, установка двигуна, енергетична установка
25. *armament* – озброєння
26. *radio sighting equipment* – радіо-целенгаційне обладнання
27. *repair shops* – майстерня з ремонту
28. *hangar* – ангар
29. *airfield* – аеродром
30. *ability* – можливість
31. *observation* – спостереження
32. *fast response* – швидке спрацьовування
33. *patience* – терпіння
34. *accuracy* – точність
35. *physical endurance* – фізична витривалість
36. *chemicals* – хімікати
37. *allergic diseases* – алергічні хвороби
38. *basic technical data* – основна технічна інформація
39. *adjustment* – налаштування
40. *to be aware* – знати
41. *malfunctions* – несправна робота
42. *fault* – неполадка
43. *bruises* – синці
44. *fractures* – перелом
45. *associated* – що спричиняє
46. *heavy objects* – важкі предмети
47. *cuts* – порізи
48. *adversely* – несприятливо

Exercise 11.3. Answer the questions:

1. What is a mechanic's responsibility?
2. What does a mechanic inspect?
3. What are a mechanic's duties?
4. Who is an aviation mechanic?
5. What are the directions of airplane mechanic?
6. What is the airplane mechanic in civil aviation?
7. What is the airplane mechanic in armed forces?
8. Where can a mechanic work?
9. What is an important quality for mechanic?
10. What knowledge and skills are necessary for mechanic?

Exercise 11.4. Translate into English:

1. Таку складну програму має встановлювати професіонал.
2. Механік має певні права та обов'язки.
3. Ви маєте відзвітувати, якщо виявите які-небудь неполадки.
4. Найближчий аеродром знаходиться через 5 кілометрів.
5. Ви можете бути точним у розрахунках.

Exercise 11.5. Translate new vocabulary into English and write your own sentences.

Перелом, хімікати, алергічні хвороби, спостереження, терпіння, майстерня з ремонту, ангар, аеродром, можливість.

Exercises:

Exercise 11.6. Choose the right modal verb:

1. It's a hospital. You ___ smoke.
2. He had been working for more than 11 hours. He ___ be tired after such hard work. He ___ prefer to get some rest.
3. I ___ speak Arabic fluently when I was a child and we lived in Morocco. But after we moved back to Canada, I had very little exposure to the language and forgot almost everything I knew as a child. Now, I ___ just say a few things in the language.
4. The teacher said we ___ read this book for our own pleasure as it is optional. But we read it if we don't want to.
5. ___ you stand on your head for more than a minute? No, I ___ .
6. If you want to learn to speak English fluently, you ___ to work hard.
7. Take an umbrella. It ___ rain later.
8. You ___ leave small objects lying around . Such objects be swallowed by children.
9. People ___ walk on grass.
10. Drivers ___ stop when the traffic lights are red.

Exercise 11.7. Choose the right variant:

Where's Julie? She's..... school.

- a) on
- b) at
- c) in
- d) no preposition

The headquarters of the United Nations is..... New York.

- a) on
- b) no preposition
- c) in
- d) at

In the most countries people drive the right.

- a) on
- b) no preposition
- c) at
- d) in

He's swimming..... the river.

- a) on
- b) at
- c) in
- d) no preposition

There is a spider..... the bath.

- a) on
- b) no preposition
- c) at
- d) in

I like to spend my holidays the seaside.

- a) in
- b) no preposition
- c) at
- d) on

Please put those apples..... the bowl.

- a) on
- b) in
- c) no preposition
- d) at

Frank is..... holiday for three weeks.

- a) on
- b) no preposition
- c) in
- d) at

Exercise 11.8. Complete each sentence using one of the words in brackets.

1. Before you walk onto the building site, please take _____ (apart / on / off / up) your shoes and then put on these safety boots.

- 2 I can't meet you at three o'clock because I'm _____ (working / training / visiting / attending) a project meeting then.
- 3 The safety officer is _____ (conducting / becoming / meeting / operating) a fire drill at 9 o'clock tomorrow morning on the main deck.
4. "What _____ (work experience / qualifications / job title / education) do you have for this job?" "Well, I repaired telephones for four years and now I repair mobile phones."
5. John is a junior technician in the IT department. He _____ (supervises / reports to / manages / reports from) the senior technician.

TEST UNIT 11

1. Complete these sentences by putting the adjective, adverb, etc. in the right form, as in the examples: The B747 is heavier (HEAVY) the DC 10.

1. 80°C is (HOT) 80° F.
2. The (BIG) negative differential pressure is -85 mb.
3. There is (MUCH) fuel in the inner tank in the outer tank.
4. The First Class seats are (COMFORTABLE) the Economy Class seats.
5. The landing speed is (LOW) when the flaps are fully extended.
6. There are (FEW) seats abreast in First Class in Economy.
7. The MAX position provides (EFFICIENT) braking.
8. The A330 has a (LONG) range the A320.
9. A check valve is the (SAME) a non-return valve.
10. "Windshield" is American (conjunction) "windscreen" is British.
11. The ZFW is (LIGHT) the MTOW.
12. A turbofan is (EFFICIENT) a conventional jet engine.
13. The "endurance" is the (LONG) time an aircraft can fly without refueling.
14. The aircraft's "ceiling" is the (HIGH) altitude it can fly at.
15. Built-in test equipment is the (GOOD) way of trouble shooting quickly.
16. After 50 hours, the strut was (CRACKED) at the first inspection.
17. The reinforced areas offer (GOOD) resistance the non-reinforced areas.
18. Automatic braking enables the plane to decelerate (SMOOTHLY).
19. Fail-safe systems have (LITTLE) probability of failure other systems.

20. Microwave Landing Systems are..... (ACCURATE)
conventional ILS.
21. ILS is installed at all major airports..... (*conjunction*) MLS is rare.
22. The..... (SHORT) the runway, the..... (HARD) the
braking.
23. A jetty is..... (FAST) way of disembarking passengers.
24. There is..... (MUCH) risk of ice-formation when there are
clouds.....in a clear sky.
25. The..... (HIGH) the engine speed, the
(HOT) the EGT.

UNIT 12. THE POWER PLANT

Exercise 12.1. Read the text below. Translate it.

Many people claim to be able to know when someone is lying. According 1.....popular belief, all you have to do is look at a person's body language; when a person is lying he becomes nervous and fidgety, touches his nose, and bites his nails. However, a researcher at Portsmouth University, England, has arrived at an entirely 2.....conclusion. Dr Samantha Mann carried 3..... research on the behavior of suspects who had given 4..... statements in police interviews.

Mann discovered that liars actually stay quite 5..... This is because they are aware that people are looking for body language that could suggest they are lying. Therefore, liars actually touch their noses 20% less than people who tell the truth. The same 6.....for eye contact. While it is general thought that liars 7.....eye contact and blink rapidly, in reality, people who are lying 8.....sure to maintain eye contact and control their blinking. With the findings of her research in mind, Mann claims that the best way to 9.....a liar is to look for people who are trying too hard to 10.....truthful.

Exercise 12.2. For questions 1-10) choose the correct answer (A, B, C or D). Write your answers on the separate answer sheet.

1	A	from	B	by	C	to	D	with
2	A	another	B	different	C	other	D	the other
3	A	up	B	down	C	in	D	out
4	A	closing	B	false	C	mistaken	D	open
5	A	stationary	B	at rest	C	still	D	slow
6	A	goes	B	comes	C	stays	D	moves
7	A	avoid	B	run	C	prevent	D	escape
8	A	keep	B	make	C	take	D	do
9	A	exhibit	B	develop	C	emerge	D	spot
10	A	view	B	display	C	show	D	appear

Exercise 12.3. Complete the following sentences with a word or expression from the box.

Tie the knot	split lip	engagement	got engaged	courting	
living In sin	got on	wined and dined	attracted to	proposed	
chatted her	fallen in love	asked her out	drift apart	cohabiting out	
					Go out

Mike first met Ally at a party and was Immediately 1.....her. He 2.....and at the end of the evening 3.....to dinner at a nearby restaurant. She accepted his offer and the next evening he 4.....her in style, with champagne and delicious, exotic foods. They 5.....well with each other, decided to meet again and then

started to 6.....on a regular basis. George's granny was delighted that he was 7.....at last. It wasn't long before they realized that they had 8..... with each other. A few months later, they bought a Hut and moved in together. George's granny disapproved them 9....., but George explained that 10.....was quite normal these days. One day, George decided to ask Alison to marry him, so after a romantic meal, he got down on one knee and 11.to her. They 12.....and the next day announced their 13.....to their friends and family. Their parents were delighted that they had decided to 14..... George's friends were not so sure however, and all agreed that they would 15.....and 16.....long before the wedding.

GRAMMAR

Past Simple (Минулий неозначений час)

Використання Past Simple

Нетривалі дії в конкретний момент у минулому

Past Simple використовується для вираження нетривалих дій, коли відомий не-точний час у минулому, в який ця дія відбувалася. Навіть якщо мовець її не за-значив певний час, то він (цей час) все одно мається на увазі.

- *She worked abroad 2 years ago.* – Вона працювала за кордоном два роки тому.
- *Harry wrote a lot of letters in 2011.* – Гаррі написав багато листів в 2011 році.
- *I met my old friend yesterday.* – Вчора я зустрів свого старого друга.

Дії, що завершилися в минулому

Past Simple використовується для вираження дій, що завершилися в минулому та не мають відношення (видимих результатів) у теперішньому. Така дія могла буди одноразовою, повторюваною, нетривалою, або ж навпаки могла тривати певний проміжок часу, але її тривалість неважлива.

- *He was a famous singer.* – Він був відомим співаком. (Він більше не співає)
- *This man once won a medal.* – Цей чоловік одного разу виграв медаль.
- *She worked abroad for 20 years.* – Вона працювала за кордоном двадцять років. (Вона більше не працює за кордоном)

Дії, що не можуть більше повторитися

Past Simple використовується також для опису дій, що відбулися одного разу в минулому і більше не можуть повторитися в теперішньому або у майбутньому через певні обставини.

- *Mary won a Math medal when she was a schoolgirl.* – Мері виграла медаль з математики, коли була школяркою. (Вона не може більше виграти медаль з математики, адже вона більше не школярка.)
- *My grandmother once sang with Freddie Mercury.* – Одного разу моя бабуся співала з Фредді Мерк'юрі. (Вона більше не може співати з ним, його немає в живих.)

Послідовні дії у минулому

Past Simple вживається для перерахування декількох дій у минулому, що відбувалися послідовно, одна за одною.

- *She entered the room and screamed.* – Вона зайшла до кімнати та закричала.
- *I woke up, washed my face and brushed my teeth.* – Я прокинувся, умився та почистив зуби.

- *He closed the door, put the key into the pocket and caught the taxi.* – Він закрив двері, поклав ключі в карман і снімав таксі.

Для вираження декількох дій, що відбувалися та тривали одночасно, використовується час Past Continuous.

- *Ann was cleaning the house while Mark was washing their car.* – Енн прибирала в будинку тоді, коли Марк мив їхню машину.
- *Kate was drawing and Paul was doing his homework.* – Кейт малювала, а Пол виконував своє домашнє завдання.

Маркери часу

Past Simple використовується, якщо на питання «коли це сталося?» можна дати чітку, але неточну відповідь про час дії. Якщо час, у який відбувалася дія, невідомий, і дія має результати в теперішньому часі, тоді використовується час з групи Perfect. Якщо відомий точний момент часу, в який відбувалася певна дія, то використовується Past Continuous.

- *yesterday* – вчора
- *the day before yesterday* – позавчора
- *just now* – тільки-но
- *the other day* – на днях
- *last week* – минулого тижня
- *last month* – минулого місяця
- *last year* – минулого року, в минулому році
- *last decade* – минулого десятиріччя
- *last century* – минулого сторіччя, в минулому сторіччі
- *an hour ago* – годину тому назад
- *three hours ago* – три години назад
- *two weeks ago* – два тижні назад
- *in 1992* – в 1992 році
- *at 6 o'clock* – о 6 годині

У часовій формі **Past Simple** дієслово має закінчення **–ed**:

I/you/he/she/it/we/they worked. (Я працював./Ти працював./Ви працювали./ Він працював./Вона працювала./Воно працювало./Ми працювали./Вони працювали.)

Деякі дієслова утворюють форму минулого часу не за загальним правилом (неправильні дієслова):

I took some books. (Я взяв кілька книжок.)

We went to the park yesterday. (Ми ходили вчора в парк.)

Дієслова у **Past Simple** не змінюються за особами та числами, за винятком дієслова **to be** (бути):

I/he/she/it was ill last week. (Я був хворий минулого тижня./Він був хворий минулого тижня.)

You/we/they were ill last week. (Ти був хворий минулого тижня./Ви були хворі минулого тижня./Ми були хворі минулого тижня./Вони були хворі минулого тижня.)

Для утворення питальних і заперечних речень використовується допоміжне дієслово **did**.

Наприклад:

Розповідне речення

I/you/he/she/it/we/they **went**. (Я ходив./Ти ходив./Ви ходили./Він ходив./Вона ходила./Воно ходило./Ми ходили./Вони ходили.)

You/we/they **were ill**. (Ти був хворий./Ви були хворі./Ми були хворі./Вони були хворі.)

I/he/she/it **was ill**. (Я був хворий./Він був хворий./Вона була хвора./ Воно було хворе.)

Заперечне речення

I/you/he/she/it/we/they **did not (didn't) go**. (Я не ходив./Ти не ходив (ви не ходили)./Він не ходив./Вона не ходила./Воно не ходило./Ми не ходили./Вони не ходили.)

You/we/they **were not (weren't) ill**. (Ти не був хворий./Ви не були хворі./Ми не були хворі./Вони не були хворі.)

I/he/she/it **was not (wasn't) ill**. (Я не був хворий./Він не був хворий./Вона не була хвора./Воно не було хворе.)

Питальне речення

Did I/you/he/she/it/we/they **go**? (Я ходив?/Ти ходив?/Ви ходили?/Він ходив?/Вона ходила?/Воно ходило?/Ми ходили?/Вони ходили?)

Were you/we/they **ill**? (Ти був хворий/Ви були хворі?)

Was I/he/she/it **ill**? (Я був хворий?/Він був хворий)

Закінчення дієслів:

У минулому часі дієслова, як правило, закінчуються на **-ed**: look – looked, call – called.

Якщо дієслово має закінчення **-e**, до нього просто додають **-d**: hope – hoped, save – saved.

Коли дієслово закінчується на приголосний + **y**, тоді **-y** змінюється на **-ied**: hurry – hurried, copy – copied.

Кінцева приголосна основи дієслова подвоюється, коли їй передуює короткий наголошений голосний: beg – begged, plan – planned.

Правила вимови:

Закінчення **-ed** вимовляється як:

[t] – після глухих приголосних, крім **-t**: asked [a:skt], liked [ˈlaɪkt],

[d] – після дзвінких приголосних, крім **-d**, та після голосних: loved [ˈlovd], cried [ˈkraɪd],

[ɪd] – після **-t, -d**: wanted [ˈwɒntɪd]; decided [dɪˈsaɪdɪd].

The Past Continuous (Progressive) Tense

Минулий тривалий час вживається для описання дій, які тривали у певний момент в минулому, або коли нам важливо підкреслити, що вони тривали **ДОВГО**. Ми пам'ятаємо, що за тривалість дії відповідає закінчення **-ING** дієслова – в якому б часі це не відбувалось! А що ж тоді відповідає за час? Авжеж, допоміжне дієслово. В **Минулому тривалому часі** – це **WAS** для однини та **WERE** для множини. Таким чином, маємо правило: Стверджувальна форма

Минулого тривалого часу утворюється за допомогою допоміжного слова **WAS**[wɒz]/**WERE** [wɜː] та закінчення **-ING**, що додається до основи дієслова-присудка.

I/HE/SHE/IT + WAS + Ving;

YOU/WE/THEY + WERE + Ving

Наприклад:

The woman was cooking dinner at 2 o'clock yesterday.

They were watching TV all day long yesterday.

Обставини часу, що вказують на Минулий тривалий час, це: **AT THAT TIME, AT 6 O'CLOCK, THE WHOLE DAY(MORNING, EVENING, WEEK...) FROM 6 O'CLOCK TO 7 O'CLOCK, ALL DAY LONG.**

Іноді ми описуємо в складному реченні **ДВІ ДІЇ**. Тоді ми поєднуємо їх за допомогою **ПОКАЗНИКІВ ЧАСУ**. Показники часу, що вказують на **Минулий тривалий час**, це: **WHILE, WHEN, AS.**

WHILE вживається, коли дві дії в одному реченні відбуваються одночасно:

While he was doing his homework, his mother was cooking dinner.

WHEN та **AS** вживаються, якщо одна дія в реченні відбулася **В МОМЕНТ** іншої, або перервала її:

The children were singing, when (as) the teacher entered the classroom.

ЗАПЕРЕЧНА ФОРМА Минулого тривалого часу утворюється за допомогою частки **NOT**, яку ми ставимо **ПІСЛЯ** допоміжного дієслова:

I/HE/SHE/IT + WAS NOT(WASN'T) + Ving

YOU/WE/THEY + WERE NOT(WEREN'T) + Ving

Наприклад:

I wasn't listening to music at that time.

READING

Read and translate the text.

TEXT: «THE POWER PLANT»

The Power Plant is designed to create power, which is required to rotate the main rotor and the tail rotor as well as for drive of auxiliary units. The helicopter power plant consists of two TV3-117VM turboshaft engines, members of engines attachment, the AI-9 APU engine, cowl, the air-cooling system, the fuel system, and the oil system of engines.

The engines are mounted in parallel to each other symmetrically to the helicopter longitudinal axis with inclination forward and down at an angle of 4° 30' to the fuselage horizontal line.

Each engine is secured in the front part to two units on frame N2 of the fuselage centre portion with the aid of four struts; the rear part of the engine is attached to the main gearbox housing with the help of spherical support.

The cowl closes the engines sections, the main gearbox and cooling fan. It consists of the following parts:



TV3-117 turboshaft engines

- Engine air intake ducts;
- The cooling fan air intake duct;
- Two covers of engines sections;
- Two upper and two side covers of the cooling fan section;
- One upper and two side covers of the gearbox section;
- Two covers of the hydraulic section;
- Two covers of the AI-9 APU engine section;
- Frames N1 and N2 of cowl.

The space under the cowl is divided into three sections by means of the longitudinal and crossline bulkheads:

- section of the port side engine;
- section of the starboard engine;
- section of the main gearbox.

WORD LIST

- 1. power plant – силова установка***
- 2. to create – створювати***
- 3. required – необхідний, обов’язковий, вказаний, той, що вимагається***
- 4. auxiliary – допоміжний***
- 5. turboshaft – турбовальний (двигун)***
- 6. engine attachments – вузли двигуна***
- 7. APU (auxiliary power unit) – ДСУ (допоміжна силова установка)***
- 8. cowl – капот двигуна***
- 9. air-cooling system – система повітряного охолодження***
- 10. fuel system – паливна система***
- 11. oil system – масляна система***

12. *parallel* – паралель, аналогія, відповідність
13. *symmetrically* – симетрично
14. *longitudinal axis* – повздовжня вісь
15. *inclination* – нахил
16. *forward* – прямо
17. *at an angle* – під кутом
18. *horizontal line* – горизонтальна лінія
19. *secured* – закріплений
20. *in the front part* – на передній частині
21. *unit* – агрегат
22. *frame (former)* – шпангоут
23. *rear (aft) part* – задня частина
24. *housing* – розміщення
25. *spherical support (strut)* – сферична опора
26. *to close* – зачиняти
27. *fan* – вентилятор
28. *air intake duct* – повітря забірник, канал забору повітря
29. *port side* – ліва сторона (по борту ЛА)
30. *starboard* – права сторона (правий борт)

Exercise 12.4. Answer the questions:

1. What is the power plant designed for?
2. What does the power plant consist of?
3. Where are the engines mounted?
4. What is the purpose of the cowl?
5. What is located under the cowl?

Exercise 12.5. Translate into English:

1. У найближчому майбутньому ми збираємося купити нові агрегати.
2. Де знаходиться головний редуктор?
3. Вентилятори розташовані в кабіні пілотів.
4. У багажному відділенні багато простору.
5. Під яким кутом до меридіану летітиме вертоліт, якщо повіє західний вітер?

Exercise 12.6. Translate new vocabulary into English and write your own sentences:

Розміщення, сферична опора, головний редуктор, горизонтальна лінія, закріплений, на передній частині, лівий борт, правий борт, поділитися на, за допомогою.

Ex.12.7. Translate the text

It would be a mistake to imagine as some foreigners do that Americans of other ethnic groups have mutated an "Anglo-Saxon" way of life or **adopted** Anglo-Saxon customs. In the middle of the 19-th century, the people of the USA were still **predominantly** "Anglo-Saxon", but even before the **flood** of non "Anglo-Saxon" immigrants, the Americans were already far more American than they were British. Whatever their

ethnic origins, the Americans of New England, the Midwest, the Far West, the South and Southwest all have special characteristics of their region. Yet they also have certain things in common. Most Americans have great **vigour** and enthusiasm. They prefer to discipline themselves rather than be disciplined by others. They **pride** themselves on their independence, their light **to make up** their own **minds**. They are prepared to take the initiative, even when there is a risk in doing so. They have **courage** and do not give in easily. They will take any sort of job anywhere rather than be unemployed. They do not **care** to be **looked after** by the Government.

Exercises:

Exercise 12.8. Put the sentences into Past Simple. Pay attention to the irregular verbs.

1. We move to a new house. →
2. They bring a sandwich. →
3. He doesn't do the homework. →
4. They sell cars. →
5. Does he visit his friends? →

Exercise 12.9. Write sentences in Past Simple.

1. Janet / miss / the bus →
2. She / tidy / her room →
3. Nancy / watch / not / television →
4. She / read / a book →

Exercise 12.10. Choose "was" or "were":

1. The teacher ___ nice.
2. The students ___ very clever.
3. But one student ___ in trouble.
4. We ___ sorry for him.
5. He ___ nice though.

Exercise 12.11. Put the verbs into the correct form (Past Continuous).

1. When I phoned my friends, they (play) ___ monopoly.
2. Yesterday at six I (prepare) ___ dinner.
3. The kids (play) ___ in the garden when it suddenly began to rain.
4. I (practice) ___ the guitar when he came home.
5. We (not / cycle) ___ all day.
6. While Alan (work) ___ in his room, his friends (swim) ___ in the pool.
7. I tried to tell them the truth but they (not / listen) ___.
8. What (you / do) ___ yesterday?
9. Most of the time we (sit) ___ in the park. sat
10. I (listen) ___ to the radio while my sister (watch) ___ TV.
11. When I arrived, They (play) ___ cards.
12. We (study) ___ English yesterday at 4:00 pm .

Exercise 12.13. Open the brackets (Past Simple or Past Continuous)

1. I (to play) computer games yesterday. 2. I (to play) computer games at five o'clock yesterday. 3. He (to play) computer games from two till three yesterday. 4. We (to play) computer games the whole evening yesterday. 5. What Nick (to do) when you came to his place? 6. What you (to do) when I rang you up? 7. I (not to sleep) at nine o'clock yesterday. 8. What he (to do) yesterday? - He (to read) a book. 9. What he (to do) the whole evening yesterday? - He (to read) a book. 10. She (to sleep) when you came home? 11. My brother (not to play) tennis yesterday. He (to play) tennis the day before yesterday. 12. My sister (not to play) the piano at four o'clock yesterday. She (to play) the piano the whole evening. 13. When I came into the kitchen, mother (to cook). 14. She (to cook) the whole day yesterday. 15. We (to wash) the floor in our flat yesterday.

TEST UNIT 12

1. Read the text below. Translate it.

Why Fathers Want to Look after the Baby

One of the most extensive surveys of fathers has now shown that, far from the stereotype, most men would *like to* share childcare duties with their partners or wives.

The survey made by the Equal Opportunities Commission shows a modern type of father: the New Dad. He *takes* part in day-to-day childcare and does not mind helping with the vacuuming and washing-up - if only when his partner asks him to. The EOC interviewed sixty-four fathers and their partners about their home and work life. Most fathers agreed that it was important to 'be there' for their children for key events such as school sports day, their first appearance in the school play and for at least one meal a day. Many agreed that parenting classes would be a good way to give them more confidence around the home.

Based on the survey results, four types of fathers were defined, from the traditional type of dad to the perfect New Dad, who is as much involved in taking care of the children as the mother. The survey found that the majority of men were somewhere between these two types.

In the first category comes Enforcer Dad, the old-fashioned disciplinarian who does not see himself as involved in the day-to-day care of his children. He sees his responsibilities as setting clear limits for them and being a role model. Most fathers do not see this as their only role.

The two biggest categories are Entertainer Dad and Useful Dad. Entertainer Dad is at his best keeping his children laughing while his partner gets on with household chores and arranging the children's school and extra activities. Useful Dad is willing to help out around the house, even though he expects the mother to be the 'Team leader' in all things domestic.

Finally, and probably every woman's dream, is Fully Involved Dad. He is equally engaged in running the home and the family, and sees the role of the father and the mother as practically identical. Fully Involved Dads adjust their work arrangements to their partners' professional duties. "I do have definite childcare commitments," said one father in this category. "There are certain times or occasions where it is non-negotiable and I just leave the office on time."

Julie Melior, chairwoman of the EOC, said that fathers were still not given enough flexibility at work and mother, would be fully supported only if employers treated (and paid) both sexes equally. "Mums and dads should be able to choose how they want to share the responsibilities of bringing up children and working outside the homes" she said. "But until we have equal pay, decent childcare and more opportunities to work flexible hours, many fathers will continue to find it hard to be there for their children and many women will continue to be disadvantaged at work. This is not necessarily the best solution for parents, children or home depends on both mums' and dads' family responsibilities being acknowledged" Melior said.

2. For questions (1-4) choose the correct answer (A , B , C Write your answers on the separate answer sheet.

1. Why would many fathers like to attend parenting classes?

- A. So they can be more confident in dealing with domestic issues
- B. So they can learn how to do day-to-day childcare
- C. Because they think it's important to be involved in the day-to-day care of children
- D. Because they want to attend important school events

2. How do Enforcer Dads view their role in childcare?

- A. They don't see childcare as their responsibility
- B. They teach their children discipline by setting an example for them
- C. They keep children amused while their partner gets on with housework
- D. It's important for them to be involved in the day-to-day care of their children

3. How do Fully Involved Dads find time to share childcare responsibilities with their partners?

- A. They fit their work commitments to their partner's arrangements
- B. They often leave the office early
- C. They run the home and the family, so their partners can focus on their professional duties
- D. They think it's their partner's responsibility to negotiate flexibility at their workplace

4. What does Julie Mellor think employers should do?

- A. They should give women more support so they can take on more of the childcare responsibilities at home
- B. They should allow parents to work from home so they can look after their children
- C. They should pay women more because they are often disadvantaged in the workplace
- D. Employers should provide both parents with equal pay and flexible working hours

3. Choose the conjunction that is most appropriate. Delete the others, as in the examples:

The INS is inoperative AND/SO/HOWEVER the aircraft is grounded.

1. The standby frequency is effective IF/SO THAT/AND the transfer key is pressed.
2. The HUD enables landing BECAUSE/PROVIDED/ALTHOUGH visibility is poor.
3. The needle is in the green range AS A RESULT/UNLESS/THUS the nitrogen pressure is low.
4. The glide scale is displayed on the ADI IN ORDER TO/SO/MOREOVER it is repeated on the HSI.
5. The shut-off valve is electrically controlled IF/BUT/BECAUSE pneumatically operated.
6. Each seat back is hydraulically reclinable. FURTHERMORE/SO/AS you can manually fold the back forward.
7. The absence of the washer does not affect installation. IN ADDITION/HOWEVER/SO it should be mounted at the next removal.
8. Cables are worn DUE TO/DESPITE/BECAUSE an absence of protection.
9. The timer generates a reset signal IN ORDER TO/THEREFORE/IF the flag remains inactive for more than 350 ms.
10. The landing gear "ground/flight" micro switches close SO THAT/DESPITE/ AS SOON AS the shock absorber is compressed.
11. Seat belts are fastened PROVIDED THAT/UNTILL/UNLESS the aircraft reaches its gate.
12. The probes are covered BECAUSE OF/IN ORDER TO/BECAUSE prevent contamination.
13. The rain repellent system is not used UNLESS/AS SOON AS/DESPITE the rain is very heavy.
14. The system was inoperative. THEREFORE/HOWEVER/SO the aircraft took off.

4. Use these basic conjunctions in the sentences 1-9 : "and", "but", "so", "so as to", "if", "due to", "although", "whereas". Look at the examples:

The aircraft network uses AC AND DC power.

The F27 is a turboprop BUT the A 300 is a turbofan.

The anti-shimmy is used SO AS TO to reduce nose wheel vibration.

1. The standby system is used.....the main system fails.
2. There is a pressure drop.....pump failure.
3. Both the low.....high levels are pre-adjusted.
4. The blower fan is inoperative.....the equipment may overheat.
5. The amplifier is designed.....to give the flight crew priority over the hostess.
6. Check the line for faults.....the antenna does not tune.
7. The card is faulty.....it must be replaced.
8. VHF transceiver 1 is mounted on rack 3.....VHF transceiver 2 is mounted on rack 5.
9. Voltage reading is not an absolute indication of battery condition.....

it is recommended to have the batteries reconditioned if values are low.

UNIT 13. MAIN CHARACTERISTICS OF HELICOPTER

Exercise 13.1. Read the text below. Translate it.

I'll Have a Job

I was fed up As I lay awake in the grey small horn's of an autumn morning. Three a.m. is not **the most propitious time for meditation**, a deep depression was settling over me. had iust returned from New York, where the crazy cyclone of gaiety in which people seem to survive over there had caught me up, **whirled me** blissfully round, and dropped me into London which seemed flat and dull. I felt restless, dissatisfied, and abominably bad-tempeied.

"Surely", I thought, "there's something more to life than just going out to parties that one doesn't enjoy, with people one doesn't even like? What a pointless existence it is — drifting about in the hope that something may happen to relieve the monotony. Something has to be done to get me out of this rut".

In a flash it came to me:

'TU have a job!

"As a matter of fact, I've got someone in the office at this very moment who might suit". She wrote down the number, and my spirits soared as I took the slip of paper she held out to me, saying: "Ring up this lady. She wants a cook immediately. In fact, you would have to start tomorrow by cooking a dinner for ten people. Could you manage that, I wonder?"

"Oh, yes", said I — never having cooked for more than four in my life. I thanked her, paid a shilling, and **dashed out** to the nearest telephone box. I collected my wits, powdered my nose, took a deep breath, and dialled the number. A piping voice at the other end informed me that I was speaking to Miss Cattermole. I assured her with all the bluff at my command, that I was just what she was looking for. I asked her what tomorrow's menu was to be.

"Just a small, simple dinner: lobster cocktails, soup, **turbot, pheasants** with vegetables, fruit salad, and **a savoury**". In a rather shaken voice, I promised to turn up in good time, and rang off.

Explain and expand on the following:

1. A deep depression was setting over me.
2. There's something more to life than just out to parties that one doesn't enjoy, with people one doesn't even like.
3. felt impelled to give her a glimpse of a widowed mother and a desperate struggle against poverty.
4. When your eyes got used to her, she resolved into a mass of multicoloured scarves, sewn haphazardly together, so that loose ends waved gaily from unlikely places to the answering flutter of orange-wool hair.

Exercise 13.2. Match choices (A-H) to (1-5). There are three choices you do not need to use. Write your answers on the separate answer sheet.

- A. The malpractice of the environmental agency
- B. The legislative battle for the red wolf recovery

- C. The way endangered species affect humans
- D. Maintaining biodiversity in today's world
- E. The causes of the red wolf species becoming endangered
- F. Significance of female species for the whole population of the red wolf
- G. Habitat loss of the red wolf in North Carolina
- H. The current population of the red wolf

GRAMMAR

Future Indefinite Tense (Майбутній неозначений час)

Використання Future Simple

Загальний майбутній час

Future Simple використовується для описання поодиноких, повторюваних або послідовних дій у майбутньому.

- *He will come here tomorrow.* – Він прийде сюди завтра.
- *I will run every morning next summer.* – Наступного літа я буду бігати кожного ранку.
- *They will go to the cinema, buy some snacks, and watch good movie next Monday.* – Наступного понеділка вони підуть у кіно, придбають щось перекусити та будуть дивитися гарний фільм.

Припущення на майбутнє

Future Simple використовується для вираження припущень або здогадок про майбутні дії або події. В такому випадку **Future Simple** часто використовується в складних реченнях, де перша частина виражена дієсловом в Present Simple: **think** (думати, вважати), **believe** (вірити), **expect** (очікувати), **be afraid** (боятися), **be sure** (бути впевненим) або ж прислівниками: **probably** (можливо), **perhaps** (мабуть), **certainly** (безумовно, точно) тощо.

- *I think he will win this competition.* – Я думаю, він виграє це змагання.
- *I'm afraid she won't come here on time.* – Боюся, що він не прийде вчасно.
- *Probably they will find the way out.* – Можливо, вони знайдуть вихід.

Обіцянки, побоювання, сподівання

Future Simple використовується для вираження обіцянок, описання чийось сподівань та надій щодо майбутнього. Часто цей час у реченні використовується зі словами: **promise** (обіцяти), **swear** (клястися), **guarantee** (гарантувати), **hope** (сподіватися), **threat** (погрожувати), **warn** (попереджати), **request** (прохати, робити запит), **offer** (пропонувати).

- *I promise we will go to the seaside next year.* – Я обіцяю, що ми поїдемо на море наступного року.
- *We hope he will enter the university.* – Ми сподіваємося, що він вступить до університету.
- *She swears she will come home in time.* – Вона присягається, що буде вдома вчасно.

Прогнози на майбутнє

Future Simple використовується для вираження того, що неодмінно здійсниться в майбутньому, і на що ми не можемо вплинути.

- *The great storm will be tomorrow.* – Завтра буде сильний шторм.

- *Anyway she will fly away.* – В будь-якому випадку він полетить геть.
- *The dawn will come soon.* – Скоро настане світанок.

Спонтанні рішення

Future Simple також виражає спонтанні, миттєві рішення або дії, які не були заплановані заздалегідь, а тільки-но спали на думку.

- *I will take this dress.* – Я візьму цю сукню. (незапланована покупка в магазині)
- *We will go there right now!* – Ми підемо туди прямо зараз! (емоційне рішення)
- *I will paint this table.* – Я пофарбую цей стіл. (рішення прийняте спонтанно, дивлячись на стіл)

Маркери часу

Future Simple використовується, якщо на питання «коли це буде?» можна вказати приблизний, неточний час. Якщо відомо точний та конкретний час або проміжок часу, в який буде виконуватися дія, то в такому випадку буде використуватися Present Continuous або Future Continuous.

- *tomorrow* – завтра
- *the day after tomorrow* – післязавтра
- *tonight* – сьогодні ввечері
- *soon* – скоро
- *as soon as* – як тільки
- *later* – пізніше
- *next week* – наступного тижня
- *next month* – наступного місяця
- *next year* – в наступному році, наступного року
- *next century* – в наступному сторіччі
- *in a week* – через тиждень
- *in a month* – через місяць
- *in three year* – через три роки
- *in two days* – через два дні
- *in one of these days* – в один із цих днів

Стверджувальне речення

Future Simple (Future Indefinite) утворюється за допомогою допоміжного дієслова will або shall та форми простого інфінітиву без частки **to** активного або пасивного стану. Дієслово to be (am, is, are) в простому майбутньому часі використовується у формі **will be** (рідше **shall be**).

Will в сучасній англійській мові вживається для всіх осіб однини та множини. **Shall** використовується з першою особою **I, We**, але його використання зараз вважається застарілим.

У сучасній англійській для всіх осіб будь-якого числа використовується тільки will й це не вважається помилкою. Але shall ще можна зустріти в газетах, старих або офіційних текстах, у художній літературі.

- *I shall go for a walk tomorrow.* – Завтра я піду на прогулянку.
- *My husband will buy this ring for me.* – Мій чоловік придбає для мене цю каблучку.
- *We will find your key tomorrow.* – Ми знайдемо твій ключ завтра.
- *The project will be presented next Tuesday.* – Проект буде представлений наступного вівторка.

- *shall* = 'll (скорочення)
- *I'll go to the cinema next week.* – Наступного тижня я піду у кіно.
- *will* = 'll
- *He'll fly to Paris next winter.* – Він полетить у Париж наступної зими.

Заперечне речення

У заперечних реченнях в **Future Simple** додається заперечна частка **not** після допоміжного дієслова **will** або **shall**. Загальний порядок слів у реченні не змінюється.

- *I will not go for a walk tomorrow.* – Я не піду завтра на прогулянку.
- *My husband will not buy this ring for me.* – Мій чоловік не придбає для мене цю каблучку.
- *We will not find your key tomorrow.* – Ми не знайдемо твій ключ завтра.
- *The project will not be presented next Tuesday.* – Проект не буде представлений наступного вівторка.
- *will not* = *won't*
- *She won't go to the cinema.* – Вона не піде у кіно.
- *shall not* = *shan't*
- *I shan't work there.* – Я не буду там працювати.

Питальне речення

Утворення загального питання в **Future Simple** відбувається шляхом винесення допоміжного дієслова **will** або **shall** на початок речення перед підметом.

- *Will I go for a walk tomorrow?* – Я піду завтра на прогулянку?
- *Will my husband buy this ring for me?* – Мій чоловік придбає для мене цю каблучку?
- *Will we find your key tomorrow?* – Ми знайдемо твій ключ завтра?
- *Will the project be presented next Tuesday?* – Чи буде проект представлений наступного вівторка?

Спеціальне питання в **Future Simple** утворюється за допомогою питального слова або фрази, що ставиться в самий початок речення. Подальший порядок слів такий самий, як і в загальному питанні для **Future Simple (will + підмет + інфінітив)**.

- *Where will I go tomorrow?* – Куди я піду завтра?
- *What will my husband buy for me?* – Що придбає для мене мій чоловік?
- *When will we find your key?* – Коли ми знайдемо твій ключ?

READING

Read and translate the text.

TEXT A: «THE GENERAL CHARACTERISTICS AND MAIN STRUCTURAL UNITS OF AIRCRAFT»

The primary components of the airplane are the airframe and the power plant. The elements of the airframe are the fuselage, the wings, the flight control surface and the landing gear. Power plant function is to develop thrust which causes the aircraft to fly. Engines are classified as piston, turbojet, turboprop, turbofan, etc.

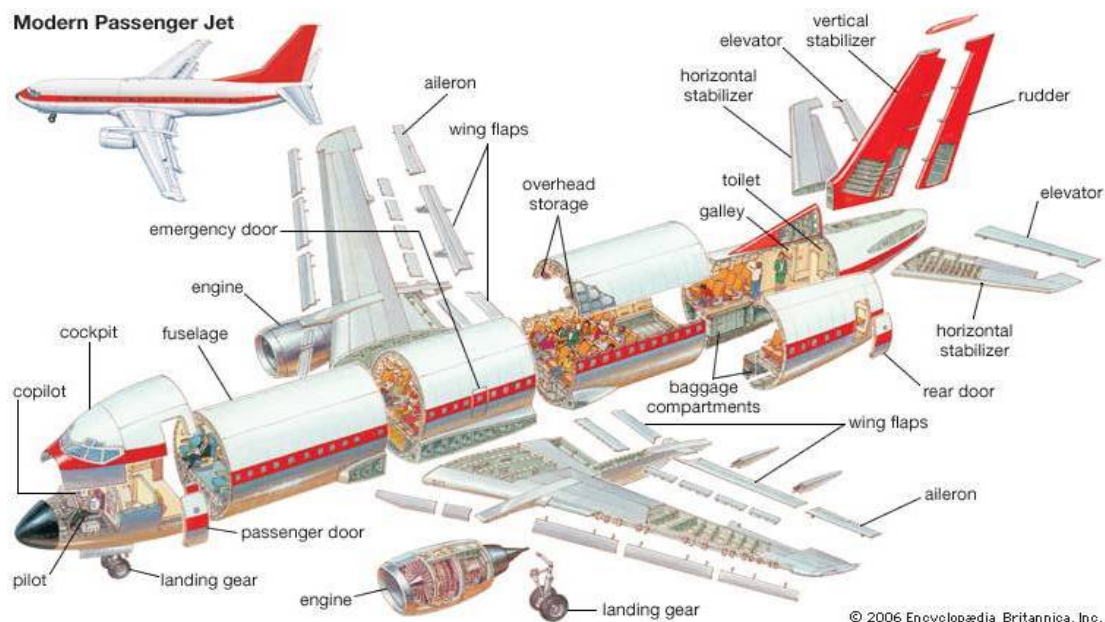
Fuselage function is to accommodate the crew, cargo, control devices, necessary instruments and equipment, fuel, power plant and armament: bombs, missiles and other weapons.

Wings, tail and the landing gear are attached to the fuselage. The function of wings is to provide high lift, to support the aircraft in flight and to provide low landing speed. Wings are attached to the fuselage in a variety of locations. Monoplanes are classified as low-wing, a mid-wing and a high wing. According to their shape wings are classified as delta-wings, swept-wings, tapered wings and variable shape wings.

Flight control surfaces are ailerons, elevators and rudder. Their function is to control the aircraft in flight, i. e. to cause it to climb, dive and turn. The rudder and elevator are hinged to immovable tail surfaces – the fin and the stabilizer. The function of the immovable tail surfaces is to stabilize the aircraft in flight, to provide its steady motion.

The function of the landing gear is to support the aircraft on the ground, to provide taxiing, take-off and landing. The basic types of landing gear are conventional or tail-wheel gear, the tricycle gear and bicycle gear or ski-wheel combination types, special-purpose gear.

The main components of the landing gear are the main gear and the nose wheel. On most aircraft the landing gear is retractable into the fuselage and/or wings.



WORD LIST

1. *airframe* – планер ПС
2. *primary* – основний
3. *component* – складова частина
4. *power plant* – силова установка
5. *flight control surface* – кермо управління
6. *function* – призначення
7. *to develop* – розвивати
8. *thrust* – тяга
9. *to cause* – викликати, спричиняти
10. *piston engine* – поршневий двигун
11. *turbojet* – турбореактивний
12. *turbofan* – турбовентиляторний

13. *turboprop* – турбогвинтовий
14. *to accommodate* – вміщувати
15. *crew* – екіпаж
16. *cargo* – вантаж
17. *device* – прилад
18. *equipment* – обладнання
19. *fuel* – паливо
20. *armament* – озброєння
21. *missile* – ракета
22. *weapon* – зброя
23. *tail unit* – хвостове оперення
24. *landing gear* – шасі
25. *to attach to* – прикріплювати
26. *to provide* – постачати
27. *variety* – різноманітність
28. *low-wing* – низькоплан
29. *mid-wing* – середньоплан
30. *high-wing* – високоплан
31. *according to* – згідно з...
32. *delta wing* – трикутне крило
33. *swept wing* – крило прямої стріловидності
34. *tapered wing* – трапецієвидне крило
35. *variable shape wing* – крило із змінною геометрією
36. *conventional (type)* – шасі звичайного типу
37. *aileron* – елерон
38. *elevator* – кермо висоти
39. *rudder* – кермо напрямку
40. *to climb* – набирати висоту
41. *to dive* – знижуватися
42. *hinged* – закріплений на шарнірах
43. *movable* – рухомий
44. *immovable* – нерухомий
45. *fin* – кіль
46. *stabilizer* – стабілізатор
47. *steady* – усталений, стійкий
48. *to support* – підтримувати
49. *tail-wheel gear* – шасі із хвостовим колесом
50. *tricycle gear* – триколісне шасі
51. *bicycle gear* – велосипедне шасі
52. *ski-wheel combination type* – шасі лижного типу
53. *special-purpose gear* – шасі особливого призначення
54. *main gear* – основна стійка шасі
55. *nose wheel* – носове колесо
56. *i.e. – id est (from Latin)* – а саме...

Exercise 13.3. Answer the questions:

1. What are the principal structural units of the aircraft?
2. How many principal structural units does the aircraft consist of?
3. What is the source of power?
4. What is the function of the wing (the fuselage, landing gear, power plant, at the flight control surfaces)?
5. What types of wings do you know?

Exercise 13.4. Give Ukrainian equivalents:

Main components, to stabilize, a variety of locations, control devices, instruments, equipment, airframe, low landing gear speed, steady motion, conventional, taxiing, cause, immovable, nose wheel.

Exercise 13.5. Give English equivalents:

Класифікується, фюзеляж, екіпаж, посадка, нерухомий, кіль, пристрій, паливо, турбогвинтовий двигун, планер, висока підйомна сила, кермо висоти.

Exercise 13.6. Put the words in the correct order:

1. Is the what function of the power plant?
2. The wheel of the landing gear the nose gear the components main are and gear.
3. Are the to what attached wings?
4. Surfaces the steady of what the provide motion aircraft?
5. And the stability provides unit of the controllability tail aircraft.

Exercise 13.7. False or True:

1. There are seven main components of the aircraft.
2. The function of the landing gear is to provide taxiing, take off and landing.
3. Thrust causes the aircraft to climb.
4. The basic types of the landing gear are tail wheel gear.
5. The wings are classified according to their shape.

Exercise 13.8. Complete the sentences.

1. The wings are the lifting ____.
2. The function of the tail unit is ____.
3. The wings are attached to ____.
4. The primary components of the aircraft are ____.
5. Engines are classified as ____.
6. The main components of the landing gear are ____.

Exercise 13.9. Translate:

1. Хвостове оперення забезпечує стійкість та управління ПС.
2. Функція крила – утримувати ПС у повітрі.
3. Шасі – це конструкція, яка утримує ПС на землі.
4. Силове устаткування є джерелом сили.

5. ПС складається з 5 структурних одиниць: силове устаткування, фюзеляж, крила, хвостове оперення, шасі.
6. Крила кріпляться до фюзеляжу.

READING

Read and translate the text.

TEXT B: «MAIN CHARACTERISTICS OF MI-8 HELICOPTER»

The helicopter is intended for transportation of personnel and various types of cargo compartment and for transportation of bulky loads attached to the external load sling system.

The helicopter diagram is a one rotor type with the main and tail rotors. The main rotor consists of 5 blades and the tail rotor is provided with three blades.

The helicopter is powered by two TV3-117 VM turboshaft engines. The take-off power of each engine is 2000 h.p.

The helicopter fuselage is a semi-monocoque type. It consists of the nose portion, the centre portion, the tail boom and the pylon.

The helicopter landing gear assembly consists of a tricycle landing gear and a tail bumper.

Each main landing gear strut carries one wheel with a pneumatic shoe-type brake. The nose strut is fitted with two castoring –type and brakeless wheels.

Helicopter Control Systems are dual. To diminish efforts applied to the control sticks and pedals the helicopter is fitted with hydraulic boosters. The hydraulic boosters take up the load from the main and tail rotors. The hydraulic boosters and the control system proper are of irreversible type. Due to this and in order to create the required forces on the control stick and foot pedals, as well as to remove these forces when the flight attitude becomes steady, use is made of spring feel mechanisms fitted with electromagnetic brakes.

These springs feel mechanisms are included into the longitudinal, lateral and directional controls of the helicopter.

The Helicopter Hydraulic System is designed to supply the helicopter control system hydraulic boosters. The hydraulic system is subdivided into the main and duplicating systems.

The Fuel System comprises one service tank, two external fuel tanks. To increase the range and endurance of flight, one or two additional fuel tanks may be installed in the cabin of the fuselage centre portion. Total capacity of the fuel system is 4415 liters.

There are three independent oil systems on the helicopter: two of them are designed to lubricate the engines and the third oil system serves to lubricate the main gearbox.

The Fire- fighting system is provided for fighting with possible fires in the zones of the left and right engines, main gearbox and APU compartment and the KO-50 kerosene heater compartment.

The jib crane and electric winch which are installed on the helicopter for performing the emergency rescue operations. Its load-carrying capacity is 150 kg.

The helicopter operation is allowed at an ambient temperature from minus 50 °C up to plus 50 °C.



Mi-8 helicopter

MI-8 MTV

HELICOPTER SPECIFICATIONS :

KEY DATA

CREW	3 Crew
PASSENGERS	22 passengers

DIMENSIONS

	Feet	Meter
Rotor Diameter	69.84 Ft	21.294 m
Vertical Separation of Rotors	N/A	N/A
Overall height to top of Rotor head	30.48 Ft	5.521 m
Cabin Dimension:	-	-
Length	17.51 Ft	5.34 m
Height	5.9 Ft	1.8 m
Width	7.67 Ft	2.34 m

WEIGHT VALUES

	Pounds	Kilograms
Empty Weight	15 840 lbs	7 200 kg
Take-off Weight	28 600 lbs	13 000kg
Maximum Cargo	8 800 lbs	4 000kg

ENGINES

Number of Engines	2
Type of Engines	TV3-117VM turboshaft
Power	2225 SHP

PERFORMANCE

Maximum Speed	124 Kts	230 km/h
Cruise Speed	113 Kts	205-215 km/h
Range on Internal Fuel	At 210 Km/h	578 Km
Endurance on Internal Fuel	800 L/hr	2Hrs 45 min
Range with Auxiliary Fuel Tanks	2 x 900 L	1050 Km
Endurance with Auxiliary Fuel Tanks	800 L/hr	5 Hrs
Hover Ceiling	13 054 Ft	3980 (-200)m
Service Ceiling	15 744 Ft	4800 (-200)m

ORD LIST

1. *to intend* – планувати, призначати
2. *transportation of personnel* – перевезення особового складу
3. *cargo compartment* – вантажний відсік
4. *bulky loads* – об'ємний вантаж
5. *to attach* – приєднувати
6. *external sling system* – система зовнішньої підвіски
7. *diagram* – схема
8. *one rotor type* – одно гвинтовий тип
9. *blade* – лопать
10. *to provide* – забезпечувати
11. *h. p. /horse power* – кінські сили
12. *take-off power* – злітна маса
13. *semi-monocoque type* – напівмонококовий тип
14. *nose portion* – носова частина
15. *tail boom* – хвостова балка
16. *pylon* – пілон, киль
17. *helicopter landing gear assembly* – система шасі вертольоту
18. *to consist of* – складатися з
19. *tricycle landing gear* – триколісне шасі
20. *tail bumper* – хвостова опора
21. *main landing gear strut* – стійка головного шасі

- 22. *wheel* – колесо
- 23. *pneumatic shoe-type brake* – пневматичні гальма колодкового типу
- 24. *nose strut* – стійка носового шасі
- 25. *castoring – type* – самообертального типу
- 26. *brakeless* – безгальмівного типу
- 27. *helicopter control system* – система органів управління вертольоту
- 28. *to diminish* – зменшувати
- 29. *effort* – спроба, зусилля
- 30. *control stick* – ручка управління
- 31. *pedals* – педалі
- 32. *hydraulic booster* – гідронідсилювач
- 33. *dual* – подвоєний
- 34. *to take up* – забирати
- 35. *load* – навантаження
- 36. *irreversible type* – нереверсивний, зафіксований
- 37. *due to this force* – завдяки цій силі
- 38. *to remove* – видаляти
- 39. *flight attitude* – положення вертольоту
- 40. *steady* – стійкий
- 41. *spring feel mechanism* – механізм пружинного типу
- 42. *electromagnetic brakes* – електромагнітні гальма
- 43. *to include* – включати
- 44. *lateral* – поперечний
- 45. *direction controls* – органи управління напрямку
- 46. *helicopter hydraulic system* – гідравлічна система вертольоту
- 47. *duplicating* – дублюючий
- 48. *external fuel tanks* – зовнішні підвісні баки
- 49. *endurance* – тривалість
- 50. *total capacity* – загальна ємність
- 51. *fire-fighting system* – протипожежна система
- 52. *kerosene heater* – керосиновий обігрівач
- 53. *jib crane* – кран із поворотною стрілою
- 54. *electric winch* – електрична лебідка
- 55. *performing* – виконання
- 56. *emergency rescue operations* – аварійно-рятувальні операції
- 57. *to allow* – дозволяти
- 58. *ambient temperature* – температура зовнішнього повітря

Exercise 13.10. Answer the questions:

1. What is the helicopter intended for?
2. How many blades are set on the main rotor?
3. What are the engines?
4. What is the take-off power of each engine?
5. What is the fuselage type?
6. What does the helicopter landing gear assembly consist of?
7. What is the purpose of helicopter control system?
8. What is spring feel mechanism?
9. Why there is helicopter hydraulic system on board?
10. Tell about fuel system.
11. How many oil systems are on the helicopter?
12. What is the purpose of fire-fighting system?
13. What is an ambient temperature for helicopter operation?

Exercise 13.11. Translate into English:

1. Яка загальна ємність видаткового баку?
2. Де знаходиться керосиновий обігрівач?
3. Температура зовнішнього повітря не має перевищувати 50 °С.
4. Для чого на вертольоті встановлено протипожежну систему?
5. Ви маєте перевірити зовнішні підвісні баки.

Exercise 13.12. Translate new vocabulary and write your own sentences:

Steady, spring feel mechanism, electromagnetic brakes, load, irreversible type, due to this force, electric winch, performing, emergency rescue operations, helicopter hydraulic system, duplicating, external fuel tanks, endurance, total.

Exercises:

Exercises 13.13. Complete the sentences in the Future Simple:

1. It (rain/not) tomorrow.
2. I promise I (be/not) late.
3. We (start/not) to watch the film without you.
4. The bus (wait/not) for us.
5. He (believe/not) us.
6. You (be) very happy.
7. You (get) a lot of money.
8. You (buy) a beautiful house.
9. Your friends (envy) you.
10. You (meet) a beautiful girl.

Exercises 13.14. Change the verb into the correct form:

1. I (help) you with your homework.
2. She (be) here very soon.
3. They (come) at 8 o'clock.
4. You (call) me next week.

5. I (use) the money wisely.
6. We (return) as soon as possible.
7. It (rain) tomorrow.
9. Ralf (pay) for it.
10. Amanda (win) this game.

Exercise 13.15. Open the brackets. Use Future Simple.

1. Вона буде зайнята. (to be busy)
2. Я не буду зайнятий.
3. Ви будете зайняті?
4. Вони будуть вдома? (to be at home)
5. Її не буде вдома.
6. Я не буду знати.
7. Вони будуть знати?
8. Вона не буде знати.

TEST UNIT 13

- 1 Underline one word in each sentence with the same or similar meaning as a word in the box. Underline the word in the sentence, and write the word from the box in the space.**

transmit / receive / display / extract / convert / operate

1. The robot has a box on its back which can get radio signals from a computer. _____
2. You have to dig deep tunnels if you want to take out the iron ore from the mountain. _____
3. Earth stations process the radio signals, and then send them to the satellite. _____
4. CCTV cameras film all the cars in the city and show them on TV screens. _____
5. Two remote control joysticks work the robot arms on the space station. _____
6. A solar panel contains cells which change light into electricity. _____

- 2 Complete the sentences. Write the correct form of words from the box in the spaces. You don't need all the words.**

collect / control / strengthen / attach / install / protect / deliver / process / reflect / monitor

1. The roof of the tunnel is falling in. We need to _____ it using concrete beams.
2. This conveyor belt _____ all the pieces of rock and carries them out of the tunnel.
3. The electricians are planning to _____ a new wiring system in the factory.
4. The boxes are _____ to the warehouse by truck, and then taken to shelves by forklift.
5. All the ladders on this site have hooks. The hooks are _____ to the tops of the ladders.
6. The giant mirrors in space will _____ light from the Sun to the Earth at night.

7. You must wear your safety helmet at all times to _____ your head from injury.
8. The police in the helicopter are _____ the crowd of 10,000 football fans.

3. Insert one missing word from the box in each sentence. You don't need all the words. Mark the position with a dash (/). Write the missing word in the space.

one / by / to / for / than / of / more / who / which
--

1. The lorry is too heavy the bridge. _____
2. My new sports car is much faster my old one. _____
3. The firemen have bought a new vehicle take them more quickly to a fire. _____
4. These days, most cars are painted and assembled robots. _____
5. Cold water flows to the water pump, then pumps the water into the engine. _____
6. Give me the spanner. No, not that one. I want the large, please. _____
7. A notebook computer is usually expensive than a desktop computer. _____
8. Please send complaints to our customer service officer, will telephone you. _____

4. Write the correct form of the adjective in the space.

1. The engine of the _____ (heavy) motorbike in the world weighs 1.8 tonnes.
2. Some drivers don't like diesel engines because they are _____ (noisy) than petrol engines.

UNIT 14. HELICOPTER FUEL SYSTEM

Exercise 14.1. Choose the word or phrase that most appropriately completes each sentence. Choose the best option: A, B, C, or D, to fill the gaps.

1. The plane is going to _____ in half an hour. Hurry up!
2. Why are you _____? Is anybody sleeping?
3. The entire village was destroyed when the _____ erupted.
4. I can't _____ that box on the top shelf. Can you get it for me, please?
5. Bryan looks really _____? What's wrong?
6. They can't afford the _____ of spending two weeks by the sea.
7. Don't tell anybody. This is a(n) _____!
8. We should take him to hospital immediately. He is _____.
9. The roof of our house _____ during the earthquake and everything was destroyed.
10. He doesn't have the _____ to lift such a heavy box. He's too young.
11. I'm really hungry. Why don't we _____ a pizza?
12. I can't _____ to buy a new car. I'll just have to keep using the old one.
13. Everybody should have _____ of speech, so that they can express their opinion.
14. He was aware of the fact that he had a(n) _____ illness. The doctor told him that he only had three more months to live.
15. Mike was _____ to buy a present for Angie's birthday but he forgot.

	A	B	C	D
1	put on	take off	turn on	turn off
2	protect in	whispering	recognizing	searching
3	lightning	volcano	storm	avalanche
4	panic	blow	reach	destroy
5	loud	main	ancient	upset
6	ground	pain	strength	luxury
7	secret	danger	stress	award
8	thick	entire	wounded	powerful
9	appreciated	considered	rewarded	collapsed
10	strength	situation	feather	pressure
11	book	charge	order	request
12	afford	appeal	cross	beam
13	reduction	requirement	freedom	transport
14	economical	natural	national	terminal
15	exposed	supposed	organized	refreshing

GRAMMAR

Числівник (The Numeral)

Числівник – частина мови, що означає число, певну кількість чого-небудь, порядок переліку при лічбі.

В англійській мові числівники поділяються на **кількісні** (Cardinal Numerals) і **порядкові** (Ordinal Numerals).

Кількісні числівники

1. Кількісні числівники відповідають на питання *скільки?* (*how many?*)

2. Основою всіх числівників є **числівники першого десятка**. За способом творення числівники поділяються на прості, похідні та складені.

3. **Прості**: one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, a (one) hundred, a (one) thousand, a (one) million.

4. **Похідні** числівники утворюються за допомогою:

а) суфікса -teen (від 13 до 19): thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen;

б) суфікса -ty (від 20 до 90): twenty, thirty, forty, fifty, sixty, seventy, ninety.

Примітка. Зверніть увагу на написання деяких похідних числівників:

two [tu:] – twelve [twelv] – twenty ['tventi]

three [θri:] – thirteen [θz:ti:n] – thirty ['θz:ti]

four [fɔ:] – fourteen [fɔ:'ti:n] – forty ['fɔ:ti]

five [faɪv] – fifteen [fifti:n] – fifty ['fifti]

eight [eit] – eighteen [er'ti:n] – eighty ['eiti]

5. **Складені числівники** утворюються сполученням простих числівників: 33 – thirty-three; 125 – one hundred and twenty-five; 7,000 – seven thousand; 2,000,369 – two million three hundred and sixty-nine.

6. Зверніть увагу:

а) якщо перед числівниками hundred, thousand, million стоїть інший числівник, то вони у множині не мають закінчення -s: five hundred; four thousand; six million;

б) якщо ж ці числівники вживаються як іменники, тобто коли перед ними немає інших числівників, вони приймають у множині закінчення -s. У цьому разі після них стоїть іменник з прийменником of:

Thousands of people come here every day. – Тисячі людей приходять сюди кожного дня;

в) в англійській мові кожні три розряди багатоцифрових чисел відокремлюються комою, а не крапкою, як в українській:

3,327,834; 853,425,103.

Крапкою відокремлюється ціле число в десяткових дробах:

38.3 – thirty-eight point three;

г) Дати позначаються кількісними числівниками:

1987 рік – nineteen eighty-seven;

д) для позначення віку вживається наступна конструкція:

I am seventeen (years old).

Порядкові числівники

1. Порядкові числівники вказують на порядок предметів і відповідають на запитання *котрий? (which?)*.

2. Порядкові числівники, за винятком перших трьох, утворюються з відповідних кількісних додаванням суфікса **-th**, при цьому в числівниках **five** і **twelve** буквосполучення **ve** змінюється на букву **f**; до числівника **eight** додається буква **h**; у числівника **nine** випадає буква **e**; у назвах десятків у змінюється на **ie**:

<i>1st – first</i>	<i>10th – tenth</i>
<i>2nd – second</i>	<i>11th – eleventh</i>
<i>3rd – third</i>	<i>12th – twelfth</i>
<i>4th – fourth</i>	<i>13th – thirteenth</i>
<i>5th – fifth</i>	<i>20th – twentieth</i>
<i>6th – sixth</i>	<i>21st – twenty-first</i>
<i>7th – seventh</i>	<i>30th – thirtieth</i>
<i>8th – eighth</i>	<i>100th – one hundredth</i>
<i>9th – ninth</i>	<i>101st – one hundred and first</i>

3. У складених порядкових числівниках лише останній набуває форми **порядкового числівника**:

- 45th – the forty-fifth
- 2614th – the two thousand six hundred and fourteenth

4. Число місяця позначається порядковим числівником з **означеним артиклем**. Числівник ставиться або перед назвою місяця з прийменником *of*, або після неї без прийменника:

- 9th of May, 2001 – the ninth of May, two thousand and one
- May 9, 2001 – May the ninth, two thousand and one

5. Іменники, перед якими стоїть порядковий числівник, вживаються з **означеним артиклем**:

- The second paragraph is more interesting than the first one. – Другий параграф більш цікавий, ніж перший.

6. При позначенні номерів глав, сторінок, частин книги тощо, порядкові числівники часто замінюються на похідні:

- the fifth page = page five – п'ята сторінка
- the seventh text = text seven – сьомий текст

7. Якщо перед порядковим числівником стоїть неозначений артикль, числівник має значення – **ще один**:

- Give me a second cup. – Дай мені ще одну чашку.

Дробові числівники

У простих дробах чисельником є **кількісний** числівник, а знаменником – **порядковий**.

Якщо чисельник більший від одиниці, то знаменник має закінчення **-s**.

Між цілою і дробовою частинами вживається сполучник **and**:

1/2 – a (one) half;

2/3 – two thirds;

2 1/3 – two and one third;

1/3 – a (one) third;

5/6 – five sixths;

3 2/5 – three and two fifths.

У десятикових дробах ціла частина відокремлюється від дробової не комою, а крапкою, яка читається **point**. Нуль читається **nought** [nɔ:t] або **zero** ['ziərəʊ] у США).

Якщо число цілих дорівнює нулю, воно часто не читається. Кожна цифра як цілої, так і дробової частини десятикового дробу читається окремо.

0.1 – nought point one або point one

2.37 – two point three seven

25.01 – twenty-five point nought one або two five point nought one

Запам'ятайте! Для позначення часу використовуються наступні конструкції:

11.00	Рівно одинадцять.	It is eleven sharp.
11.10	10 хвилин на дванадцяті.	It's ten past eleven.
11.15	Чверть на дванадцяті.	It's a quarter past eleven.
11.30	Половина на дванадцяті.	It's half past eleven.
11.45	Без чверті дванадцять.	It's a quarter to twelve.
11.50	10 хвилин до дванадцятої.	It's ten to twelve.

READING

Read and translate the text.

TEXT A: «MI-8 HELICOPTER FUEL SYSTEM»

The fuel system is designed to arrange fuel on the helicopter and to supply it to the both engines, APU and to the kerosene heater at all ratings of flight. In the helicopter the fuel is distributed among three main fuel tanks, two of which are rigid external tanks, placed from the outside along the fuselage boards and one is flexible service tank, located inside the container behind the main gear box. If needed be, increase flight range and endurance, one or two additional rigid tanks may be installed inside the fuselage.

Fuel is supplied to the engines from the service tank by means of one booster pump, which supplies fuel through the shut-off valves to the fuel pumps of engines. Fuel is fed to the service tank from the external tanks with the help of two fuel transfer pumps. If the

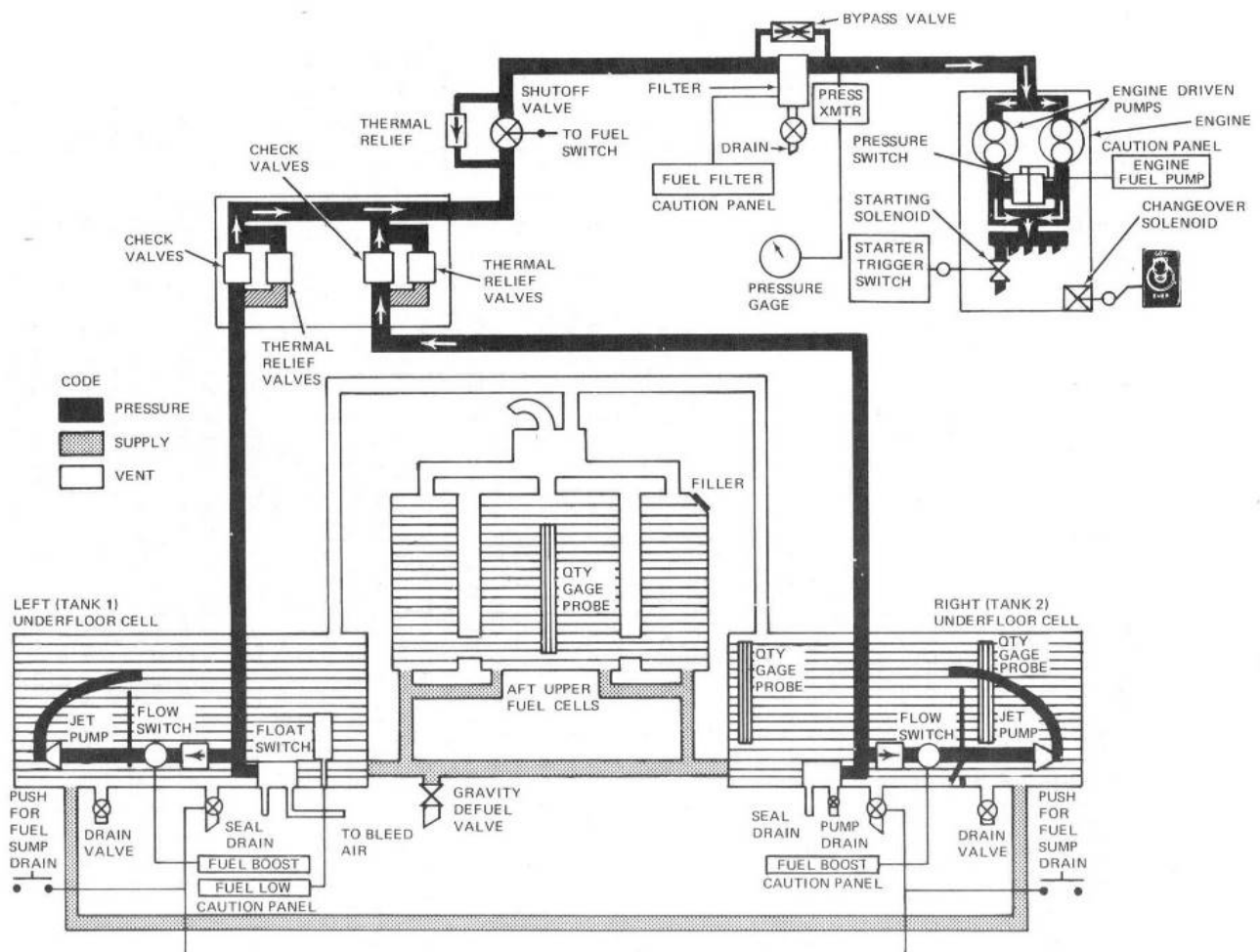
additional tanks are installed in the helicopter, in this case fuel is supplied to the external tanks by gravity. Thus, first of all the fuel quantity is used from the service tank.

A float-metering valve is mounted in the service tank. It serves to prevent the service tank against overfilling during fuel transfer from the external tanks. In case of the metering valve fails, there is a by-pass valve, which ensures the fuel supply from the external tanks into the service tank. When one of fuel transfer pumps fails, the fuel flows freely from one tank into another one and it is transferred from both external tanks into the service tank by means of one pump.

The service fuel tank is installed in a special container between frames N 10 and N 13 on the ceiling panel of the fuselage centre part. It is manufactured from a kerosene-resistant rubber and rubberized caprone fabric. The upper part of the tank carries a plate, mounting the following equipment: one filler, fuel quantity gauge transmitter, fuel supply connection, metering float valve, fuel by-pass valve, vent union.

When inspecting the helicopter it is necessary to do the following:

- to check the tightness of the fuel system units and connections;
- to check the covers of the fuel tanks fillers for proper closing;
- to check the tightness of the drain cocks for proper closing



WORD LIST

1. *to arrange* – влаштувати, організовувати, монтувати, переробляти
2. *to supply* – забезпечувати
3. *flight rating* – льотний режим
4. *to distribute* – розподіляти
5. *rigid external tank* – жорсткий підвісний бак
6. *outside* – ззовні
7. *flexible* – гнучкий
8. *service tank* – видатковий бак
9. *additional* – додатковий
10. *flight range* – дальність польоту
11. *booster pump* – насос, що підкачує
12. *shut-off valve* – відсічний клапан, перекирваний
13. *fuel pump* – паливний насос
14. *to feed (fed, fed)* – живити
15. *with the help of* – за допомогою
16. *transfer pump* – насос для перекачування
17. *in this case* – в цьому випадку
18. *by gravity* – самотливом (під силою тяжіння при навантаженні)
19. *quantity* – кількість
20. *to prevent* – запобігати
21. *float-metering valve* – поплавковий клапан
22. *overflowing* – переповнення
23. *fuel quantity gauge* – індикатор кількості палива
24. *by-pass valve* – перепускний клапан, зворотний клапан
25. *to ensure* – переконатися, забезпечити
26. *to flow* – протікати
27. *ceiling panel* – стеля
28. *manufactured* – випущений
29. *kerosene-resistant* – керосиностійкий
30. *filler* – заливна горловина
31. *tightness* – герметичність
32. *vent* – канал
33. *to bleed the air* – стравлювати повітряну пробку
34. *drain valve* – зливний клапан/кран
35. *sump* – піддон

Exercise 14.3. Answer the questions:

1. What is the fuel system designed to?

2. What is the way of fuel in the system?
3. Why there is float-metering valve?
4. Where is a service tank located? What is the purpose of it?
5. What are the actions of mechanic when inspecting the helicopter fuel system?

Exercise 14.4. Translate into English:

1. Який об'єм має видатковий бак?
2. Яким чином розподіляється паливо в системі?
3. Який льотний режим необхідно застосувати?
4. Яка функція відсічного клапана?
5. Які ваші дії, якщо паливний бак переповнений?
6. Яка критична кількість палива може бути в баку?

Exercise 14.5. Translate using new vocabulary:

Shut-off valve, fuel pump, with the help of, transfer pump, in this case, vent union, tightness, by pass valve, ensure, to flow, manufactured, filler, to prevent, float-metering valve.

READING

Read and translate the text.

TEXT B: «AIRCRAFT AND THEIR CLASSIFICATION»

In order to fly man must have aircraft, i. e. weight-carrying device capable of creating the lift. Three principles of creating the lift are known: aerostatic, aerodynamic and reactive. Accordingly, aircraft may be divided into two main groups: aircraft, the lift of which is created on the base of aerostatic principle, and aircraft capable of creating the lift on the base of aerodynamic or reactive principle. The former are called lighter-than-air craft or aerostats, and latter heavier-than-air craft or aerodyne.

Aerostats are subdivided into airships and balloons, the difference being that a balloon is an aerostat without a propelling system, while an airship is an aerostat provided with the propelling system and with means of controlling the direction of motion.

Heavier-than-air craft may be subdivided into airplanes, helicopters, autogiros, ornithopters, and gliders according to the means of creation of the lift.

The airplane is a mechanically driven fixed-wing aircraft, heavier-than-air, which is supported by the dynamic reaction of the air over its wing surfaces.

The principal features of the helicopter are two rotating airscrews mounted on a vertical driving shaft, revolving in opposite directions. These provide the lift required to support the machine.

The principal feature of autogiro is a rotor having a number of blades which auto rotate under the action of the relative wind, and which are also free to rise and fall with the pressure of the air: these blades provide the necessary lift for supporting the weight of the machine.



Ornithopter derives its chief support and propelling force from flapping wings.



Glider is similar to an airplane but without a power plant.

Aircraft may be divided according to the purpose for which they are used into civil machines and military machines.

The airplane is usually qualified by the number and position of its main planes. There is the monoplane, which has only one wing, or, as it is sometimes considered preferable to say, one pair of wings. Then, there is the biplane, which has two pairs of wings, one set above the other.

According to the number of engines installed in aircraft it may be divided into single-engine, two-engine and, in general, multi-engine aircraft.

Airplanes may be also divided into four types as follows:

1. the landplane
2. the float seaplane
3. the boat seaplane
4. the amphibian.

The landplane, as the name implies is restricted to use from land the second and third types use water only as their take-off and landing

WORD LIST

1. *weight-carrying device* – *прилад для перевезення вантажу*
2. *aerostatic* – *аеростатичний*
3. *aerodynamic* - *аеродинамічний*
4. *reactive* – *реактивний*
5. *accordingly* – *відповідно*
6. *former* – *перший з двох варіантів*
7. *latter* – *останній*
8. *aerodyne* – *літальний апарат, що важче за повітря*
9. *airship* – *дирижабль*
10. *balloon* – *повітряна куля*
11. *propelling system* – *система руху*

12. *motion* – рух
13. *autogiros* – автожир
14. *ornithopters* – орнітоптери
15. *glider* – планер
16. *fixed-wing aircraft* – літак
17. *dynamic* – рушійна сила, динамічний
18. *surface* – поверхня
19. *principal features* – особливі риси
20. *rotating airscrews* – гвинта, що обертаються
21. *to mount* – кріпити
22. *driving shaft* – провідний вал
23. *revolving* – той, що обертається
24. *opposite* – протилежний
25. *relative wind* – відносна швидкість вітру
26. *autorotate* – здійснювати кругові оберти
27. *flapping wings* – крила, що виконують змах
28. *monoplane* – моноплан
29. *biplane* – біплан
30. *single* – один
31. *to imply* – означати
32. *restriction* – обмеження
33. *landplane* – сухопутний літак (із сухопутними шасі)
34. *float seaplane* – літак із поплавковим шасі
35. *boat seaplane* – гідролітак
36. *amphibian* – літак-амфібія

Exercise 14.6. Explain:

1. The landplane is...
2. Glider is...
3. The amphibian is...
4. The monoplane is...
5. Aerostats are...
6. Aerodynes are...
7. The float seaplane is...
8. The autogiro is...
9. The helicopter is...
10. The boat seaplane is...

Exercise 14.7. Translate into English:

1. Що таке орнітоптер?
2. Ви коли-небудь літали на повітряній кулі?
3. Чи складно управляти дирижаблем?
4. Які особливі риси має вертоліт Сікорського?
5. Які вікові обмеження існують в авіації?

Exercise 14.8. Translate new vocabulary into Ukrainian:

A. Restriction, landplane, float seaplane, monoplane, biplane, opposite, relative wind, ornithopters, glider, fixed-wing aircraft, dynamic.

B. Translate into English:

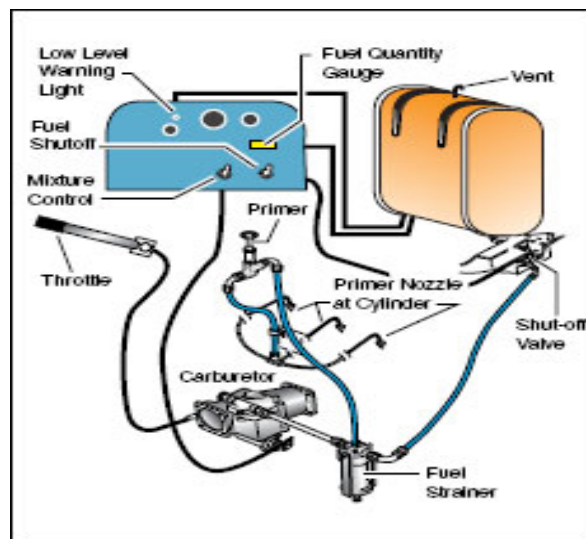
1. Нам потрібне повітря, щоб дихати.
2. Повітря, що рухається, називається вітер.
3. Вітер може бути корисним та завдавати шкоди.
4. Люди будували повітряні млини, щоб молоти муку, та навчились використовувати вітрила на човнах.
5. Люди спостерігали за птахами та хотіли навчитися літати, як вони.

READING

Read and translate the text.

TEXT C: «FUEL SUPPLY SYSTEM»

The supply system consists of a fuel tank or tanks, fuel quantity gauges, a shut-off valve, fuel filter, a fuel line to the engine, and possibly a primer and fuel pumps.



A typical gravity feed fuel system, in a helicopter with a reciprocating engine, contains the components shown here.

The fuel tanks are usually mounted to the airframe as close as possible to the center of gravity. This way, as fuel is burned off, there is a negligible effect on the center of gravity. A drain valve located on the bottom of the fuel tank allows the pilot to drain water and sediment that may have collected in the tank. A fuel vent prevents the formation of a vacuum in the tank, and an overflow drain allows for fuel to expand without rupturing the tank. A fuel quantity gauge located on the pilot's instrument panel shows the amount of fuel measured by a sensing unit inside the tank. Some gauges show tank capacity in both gallons and pounds.

The fuel travels from the fuel tank through a shut-off valve, which provides a means to completely stop fuel flow to the engine in the event of an emergency or fire. The shut-off valve remains in the open position for all normal operations.

Most non-gravity feed fuel systems contain both an electric pump and a mechanical engine driven pump. The electrical pump is used to maintain positive fuel pressure to the engine pump and also serves as a backup in the event of mechanical pump failure. The electrical pump is controlled by a switch in the cockpit. The engine driven pump is the primary pump that supplies fuel to the engine and operates any time the engine is running.

A fuel filter removes moisture and other sediment from the fuel before it reaches the engine. These contaminants are usually heavier than fuel and settle to the bottom of the fuel filter sump where they can be drained out by the pilot.

Some fuel systems contain a small hand-operated pump called a primer. A primer allows fuel to be pumped directly into the intake port of the cylinders prior to engine start. The primer is useful in cold weather when fuel in the carburetor is difficult to vaporize.

The purpose of the fuel control system is to bring outside air into the engine, mix it with fuel in the proper proportion, and deliver it to the combustion chamber.

Fuel is delivered to the cylinders by either a carburetor or fuel injection system.

In a fuel injection system, fuel and air are metered at the fuel control unit but are not mixed. The fuel is injected directly into the intake port of the cylinder where it is mixed with the air just before entering the cylinder. This system ensures a more even fuel distribution in the cylinders and better vaporization, which in turn, promotes more efficient use of fuel. Also, the fuel injection system eliminates the problem of carburetor icing and the need for a carburetor heat system.

The fuel control system on the turbine engine is fairly complex, as it monitors and adjusts many different parameters on the engine. These adjustments are done automatically and no action is required of the pilot other than starting and shutting down. No mixture adjustment is necessary, and operation is fairly simple as far as the pilot is concerned. New generation fuel controls incorporate the use of a full authority digital engine control (FADEC) computer to control the engine's fuel requirements. The FADEC systems increase efficiency, reduce engine wear, and also reduce pilot workload. The FADEC usually incorporates back-up systems in the event of computer failure.

READING

Read and translate the text.

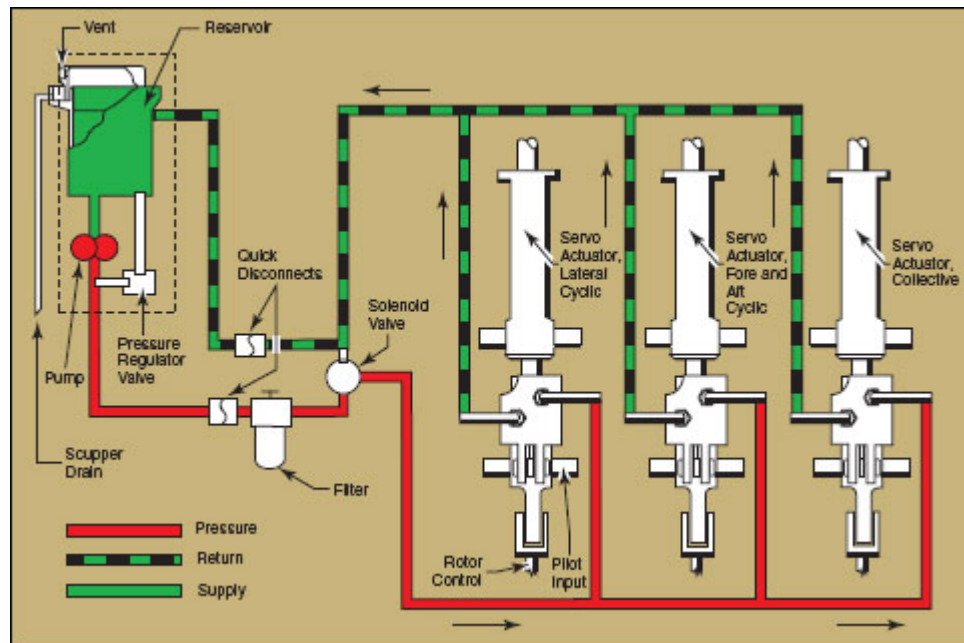
TEXT D: «HYDRAULICS»

Most helicopters, other than smaller piston powered helicopters, incorporate the use of hydraulic actuators to overcome high control forces. A typical hydraulic system consists of actuators, also called servos, on each flight control, a pump which is usually driven by the main rotor gearbox, and a reservoir to store the hydraulic fluid. A switch in the cockpit can turn the system off, although it is left on under normal conditions. A pressure indicator in the cockpit may also be installed to monitor the system.

When you make a control input, the servo is activated and provides an assisting force to move the respective flight control, thus lightening the force required by the pilot. These boosted flight controls ease pilot workload and fatigue. In the event of hydraulic

system failure, you are still able to control the helicopter, but the control forces will be very heavy.

In those helicopters where the control forces are so high that they cannot be moved without hydraulic assistance, two or more independent hydraulic systems may be installed. Some helicopters use hydraulic accumulators to store pressure, which can be used for a short period of time in an emergency if the hydraulic pump fails. This gives you enough time to land the helicopter with normal control



A typical hydraulic system for helicopters in the light to medium range is shown here.

READING

Read and translate the text.

TEXT E: «AUTOPILOT»

Helicopter autopilot systems are similar to stability augmentations systems except they have additional features. An autopilot can actually fly the helicopter and perform certain functions selected by the pilot. These functions depend on the type of autopilot and systems installed in the helicopter.

The autopilot system consists of electric actuators or servos connected to the flight controls. The number and location of these servos depends on the type of system installed. A two-axis autopilot controls the helicopter in pitch and roll; one servo controls fore and aft cyclic, and another controls left and right cyclic. A three-axis autopilot has an additional servo connected to the anti-torque pedals and controls the helicopter in yaw. A four-axis system uses a fourth servo which controls the collective. These servos move the respective flight controls when they receive control commands from a central computer. This computer receives data input from the flight instruments for attitude reference and from the navigation equipment for navigation and tracking reference. An autopilot

has a control panel in the cockpit that allows you to select the desired functions, as well as engage the autopilot.

For safety purposes, an automatic disengage feature is usually included which automatically disconnects the autopilot in heavy turbulence or when extreme flight attitudes are reached. Even though all autopilots can be overridden by the pilot, there is also an autopilot disengage button located on the cyclic or collective which allows you to completely disengage the autopilot without removing your hands from the controls. Because autopilot systems and installations differ from one helicopter to another, it is very important that you refer to the autopilot operating procedures located in the Rotorcraft Flight Manual.

Exercises:

Exercise 14.9. Test:

1. 145 _____ live in the Ukraine.
 - a. millions people
 - b. millions of people
 - c. million of people
 - d. million people

2. _____ are starving in the world today.
 - a. Thousands people
 - b. Thousands of people

3. You are _____ who asks me this stupid question.
 - a. fifth
 - b. the fiveth
 - c. the fifth
 - d. five

4. Two _____ of my income I spend on my pet's food.
 - a. twelve
 - b. twelfth
 - c. twelves
 - d. twelfths

5. Every _____ person in our company is not satisfied with his salary.
 - a. three
 - b. the third
 - c. third

6. Ok! See you on _____ of April.
 - a. the twentyth-seventh
 - b. twenty-seven

c. the twenty-seventh

7. It is _____ hit. I like such songs.

a. his the third

b. his third

c. the third his

8. _____ of the territory is covered with ice.

a. one thirds

b. one third

9. This bouquet costs _____ dollars!

a. two hundreds

b. two hundred

c. two hundred of

10. Two thirds of my work _____ dedicated to the theory of the subject.

a. are

b. is

Exercise 14.10. Translate into English:

1. П'ятдесят сантиметрів

2. Триста кілометрів

3. Півтори години

4. Чверть пирога

5. Два мільйони тон

Exercise 14.11. Write with numbers:

1. two hundred and forty-five, five hundred and thirty-three, eight hundred and sixteen.

2. three thousand five hundred and sixty-two, seven thousand three hundred and twenty-four.

3. one hundred books, a hundred (of) pages, hundreds of people.

4. one thousand cars (a thousand cars), thousands of people, millions of books.

5. two and three is five (two plus three equals five), seven minus four is three, three multiplied by five is fifteen, ten divided by two is five.

6. The 1st of January (1 January, January 1 – The first of January, January the first), the 8th of March (8 March, March 8 – The eighth of March, March the eighth).

7. Chapter five, bus six.

8. Three point four five, eight point zero nine.

9. Two thirds, four fifths.

TEST UNIT 14

1. Translate into English.

A.

1. Сьогодні важко уявити світ без літаків.
2. Більшість країн мають власні повітряні сили.
3. Літаки повітряних сил використовуються під час війни.
4. Лише багаті країни мають потужні повітряні сили, тому що військові літаки дуже дорогі.
5. Країни мають національні авіакомпанії.

B.

1. Літак складається з п'яти основних конструктивних частин.
2. Це – фюзеляж, крило, силова установка, хвостове оперення та шасі.
3. Фюзеляж – це корпус літака.
4. У ньому розміщуються екіпаж, пасажери, вантаж, багаж та обладнання.
5. На фюзеляж також встановлюються крило та хвостове оперення. Крило та хвостове оперення кріпляться до фюзеляжу.

C.

1. Ділянка літака, де сидить пілот, називається кабіна пілота.
2. Люди, що працюють в кабіні пілота, називаються екіпажем.
3. Завдання пілота – контролювати важелі та педалі керма.
4. Завдання другого пілота – допомагати пілоту в навігації та зв'язку.
5. Навігація така ж важлива, як і політ.

D.

1. На початку сторіччя ще не було аеропортів.
 2. Перші літаки злітали з великих полів та піщаних пляжів.
 3. Ангари були необхідні для стоянки літака під час обслуговування.
 4. З появою пасажирського транспорту були необхідні зали очікування.
 5. Після другої світової війни військові аеродроми перейшли до цивільного
- використання.

E.

1. Аеропорт включає в себе льотне поле та службово-технічну територію.
2. Аеропорт включає в себе контроль повітряного простору навколо аеропорту.
3. Аеродром включає в себе злітні смуги та смуги руління.
4. Злітна смуга використовується для зльоту та приземлення літака.
5. З кінців злітної смуги є кінцеві смуги безпеки.

UNIT 15. OIL SYSTEM

Exercise 15.1.

Choose the word or phrase that produces a grammatically correct sentence.

Choose the best option: A, B, C, or D, to fill the gaps.

1. My parents _____ Rome in two months.
2. When I _____ Matthew at the party yesterday, he didn't speak to me.
3. Julie _____ put her coat on because it was very cold outside.
4. Tonight Laura _____ TV as always.
5. Liz _____ to Finland next year.
6. Jake _____ after we had left from the restaurant.
7. Chris reminded me _____ to send the e-mails that day.
8. In _____ of the fact that he was wearing a seat belt, Henry was injured in the accident.
9. All the documents must _____ by tonight.
10. This exercise is too difficult for me _____.
11. I may _____ my wallet at home.
12. I wish I _____ on the beach since it's too hot today.
13. Sam wishes he _____ that job abroad last year.
14. What _____ for Jake's birthday?
15. By this time next year I _____ English for nineteen years.

Exercise 15.2. For questions (1-10) choose the correct answer (A, B, C or D). Write your answers the separate answer sheet.

No	A	B	C	D
1	visited	visit	are visiting	used to visit
2	saw	am seeing	was seeing	didn't see
3	had to	must	might	can't
4	will have watched	will be watching	watches	she will watch
5	is going to move	will have been moving	moves	going to move
6	called	was calling	had been calling	had called
7	to not forget	not forget	not to forget	to have forgotten
8	spite	order	though	due
9	send	have sent	to send	be sent
10	doing	to do	do	have done
11	to have left	left	leaving	have left
12	am	had been	were	would be
13	would accept	had accepted	accepted	accepts
14	you bought	you are buying	didn't you buy	did you buy
15	will teach	am going to teach	will have been teaching	am teaching

GRAMMAR

Неозначені займенники (The Indefinite Pronouns)

1. Неозначені займенники поділяються на прості і складні. **Простими неозначеними займенниками** є: all, each, some, any, another, other, much, many, little, few, both, one.

2. **Складні неозначені займенники** утворюються від простих займенників some, any, no, every додаванням до них -body, -one, -thing (somebody, anybody, nobody, everybody, someone, anyone, everyone, something, anything, nothing, everything).

3. **Some** і похідні від нього займенники вживаються у стверджувальних реченнях, any і його похідні вживаються у питальних і заперечних реченнях

some – якийсь, дехто	somebody / someone – хтось	something – щось	somewhere – десь, кудись
any – який- небудь, якийсь	anybody / anyone – хтось, хто- небудь	anything – щось	anywhere – де-небудь, куди- небудь
no – ніякий	nobody / no one – ніхто	nothing – ніщо, нічого	nowhere – ніде, нікуди
every – кожний	everybody / everyone – кожний, усі	everything – усе	everywhere – всюди, скрізь

4. Займенник **some** перед обчислюваними іменниками у множині означає кілька, деякі, одні, інші:

We have some English books. – У нас є кілька книжок англійською мовою.

He asked some questions. – Він поставив кілька запитань.

5. Перед обчислюваними іменниками в однині **some** означає якийсь, який-небудь:

I read it in some book. – Я прочитав це в якійсь книжці.

6. Перед необчислюваними іменниками **some** означає деяка кількість і українською мовою не перекладається:

He bought some butter. – Він купив масла.

Стверджувальні речення	Питальні речення	Заперечні речення
There are some books there. – Там є книжки.	Are there any books there? – Там є книжки?	There aren't any books there. / There are no books there. – Там немає книжок.
There is someone in the room. – У кімнаті є хтось.	Is there anyone in the room? – Є хтось у кімнаті?	There isn't anyone in the room. / There is no one in the room. – У кімнаті нікого немає.
She gave me something to read. – Вона дала мені щось почитати.	Did she give me anything to read? – Вона давала мені щось почитати?	She didn't give me anything to read. / She gave me nothing to read. – Вона нічого не дала мені почитати.

7. Займенники some, somebody, something вживаються у спеціальних та загальних запитаннях, що виражають пропозицію або прохання:

Would you like some tea? – Ти хочеш чаю?

8. Займенники any, anybody, anyone, anything вживаються у стверджувальних реченнях у значенні усякий.

Anybody can do it. – Усякий може це зробити.

9. Після займенників somebody, anybody, something, anything, nobody прийменник of не вживається. Замість цього використовується some of, any of, none of.

Some of our students played football last week. – Деякі з наших студентів грали у футбол минулого тижня.

Have you got any of his letters? – Ви отримали які-небудь з його листів?

None of them knew about it. – Ніхто з них не знав про це.

READING

Read and translate the text.

TEXT A: «OIL SYSTEM»

The oil system is responsible for lubrication and cooling of the moving parts of the engine. Each engine has an oil system. The engine oil system is divided into the inner part, mounted on the engine and the outer part, mounted on the fuselage.

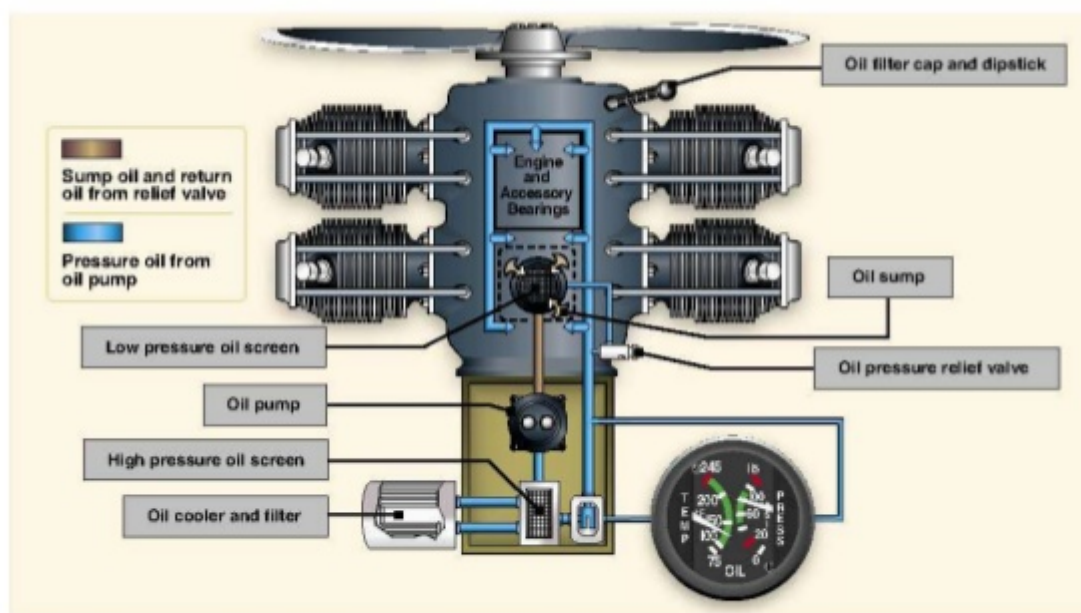
The outer part of the oil system of each engine includes the following equipment:

- Oil tank
- Air-oil cooler
- Two drain valves
- Oil systems instruments (pressure gauge and temperature indicator)
- Pipelines

The engine oil system performs several important functions, including:

- Lubrication of the engine's moving parts
- Cooling of the engine by reducing friction
- Removing heat from the cylinders
- Carrying away contaminants

The oil system of the main gear box is provided with the oil sump, oil pump, oil filter, two oil coolers with thermoregulators. Oil is held in the sump below the engine.



The sump contains a filler neck whose cap holds a dipstick so the oil level can be checked. This should be done before flight.

Then the oil passes through a filter that removes microscopic particles of a metal due to engine wear and combustion products that have found their way past the piston rings into the oil. The filter needs to be replaced periodically. If the filter becomes clogged, a spring-loaded valve opens allowing oil to bypass the filter.

Next the oil passes to the oil cooler. The cooler is bypassed by a thermostatic valve that is open at low temperatures to allow the oil to warm up quickly.

The engine oil has a finite life because it builds up an increasing load of acids, which are by-products of combustion, and water from condensation.

Oil from the oil tank passes to the intake line to the pressure pump. From the pump, oil is delivered through the shut-off valve and filter to the drive box for lubrication, five supports, and engine central drive.

Oil is scavenged from the drive box by the pump directly to the oil tank passing the air-oil cooler.

Through the bypass valve, some quantity of oil is delivered into the oil tank bypassing the oil cooler. This prevents oil from splashing into engine duct.

WORD LIST

1. *responsible for* – відповідальний за
2. *lubrication* – змащування
3. *cooling* – охолодження
4. *moving part* – рухома частина
5. *to divide into* – підрозділяти
6. *inner part* – внутрішня частина
7. *mount* – установка, монтаж
8. *outer part* – зовнішня частина
9. *to include* – складатися з
10. *oil cooler* – охолоджувач масла
11. *drain valve* – зливний кран
12. *pipeline* – трубопровід
13. *pressure gauge* – вимірювач тиску, манометр
14. *temperature indicator* – показник температури
15. *pipeline* – трубопровід
16. *to reduce* – зменшувати
17. *friction* – тертя
18. *to remove* – усунути
19. *contaminant* – забруднюючі речовини
20. *gear box* – редуктор
21. *oil sump* – масловідстійник
22. *oil filter* – масляний фільтр
23. *thermoregulator* – терморегулятор
24. *filler neck* – заливна горловина
25. *cap* – ковпак
26. *engine wear* – знос двигуна
27. *piston* – поршень
28. *ring* – кільце
29. *to clog* – засмічувати
30. *spring-loaded valve* – пружинний клапан
31. *bypass* – перепуск

32. *dipstick* – мірна лінійка
33. *thermostatic valve* – термостатичний клапан
34. *finite life* – обмежений термін служби
35. *increase* – зростання
36. *acid* – кислота
37. *combustion* – спалювання
38. *condensation* – конденсація
39. *intake line* – впускний патрубок
40. *pressure pump* – нагнітаючий насос
41. *shut-off valve* – перекривний клапан, стоп-кран
42. *support* – опорна стійка
43. *drive* – привід
44. *to scavenge* – відкачувати
45. *assembly* – набір, складальний вузол
46. *to prevent* – запобігати
47. *a breathing tank* – суфлюючий бачок, дихальна ємність

Exercise 15.3. Answer the questions:

1. What is the oil system responsible for?
2. What units does the oil system consist of?
3. What are the important functions of the oil system?
4. What elements does the outer part of the oil system include?
5. What does the by-pass valve provide?
6. What prevents oil from splashing?

Exercise 15.4. Give Ukrainian equivalents.

Piston, a breathing tank, a shut-off valve, lubrication, a by-pass valve, to prevent oil from splashing, some quantity of oil, carrying away contaminants, a filter that removes microscopic particles, to allow the oil to warm up, the filter becomes clogged, a filter, a spring-loaded valve.

Exercise 15.5. Give English equivalents.

Масловідстійник, центральний привід, опора, зливний кран, стоп-кран, терморегулятор, проходить через масляний радіатор, манометр, запобігає розбризкуванню масла, трубопровід, внутрішня частина встановлена на двигуні.

Exercise 15.6. Complete the sentences.

1. The oil system of the main gear box is provided with _____
2. The engine oil system is divided into _____
3. From the pump, oil is delivered through the _____
4. The main components of the oil system are _____
5. Some quantity of oil is delivered into _____

Exercise 15.7. Match English and Ukrainian equivalents.

A	B
1. oil servicing truck	a) розподільний пістолет
2. filler neck	b) маслозаправник
3. deliver	c) зливний кран
4. dispense gun	d) підкачуючий насос
5. provide	e) заливна горловина
6. protective gauze	f) доставляти
7. perform	g) флюгер-насос
8. drain plug	h) лобовий картер
9. feathering pump	i) забезпечувати
10. booster pump	j) виконувати
11. front casing	k) вручну
12. manually	l) трубка
13. tube	m) захисна сітка

Exercise 15.8. In the list below find a definition for the given words

A	B
1. oil	a) any machine designed to convert energy, especially heat energy, into mechanical work
2. tank	b) porous substance, such as paper or sand, that allows fluid to pass but retains suspended solid particles: used to clean fluid or collect solid particles
3. engine	c) any device for compressing, driving, raising, or reducing the pressure of a fluid
4. gauze	d) a protective case or cover
5. filter	e) any of a number of viscous liquids with a smooth sticky feel
6. pump	f) any device that shuts off, starts, regulates, or controls the flow of a fluid
7. valve	g) a passage, valve or a part through which a substance, especially fluid, enters a device or a machine
8. casing	i) a large container or reservoir for the storage of liquids or gases
9. inlet	j) operated or done by hand
10. manually	k) transparent cloth of loose plain or leno weave

Exercise 15.9. Insert somebody, anybody, nobody or everybody.

1. Has ... in this group got a dictionary?

somebody

anybody

nobody

everybody

2. ... left a magazine in our classroom yesterday.

somebody

anybody

nobody

everybody

3. The question was so difficult that ... could answer it.

somebody

anybody

nobody

everybody

4. I am afraid I shan't be able to find ... in the office now: it is too late.

somebody

anybody

nobody

everybody

5. ... knows that water is necessary for life.

somebody

anybody

nobody

everybody

6. Is there ... here who knows French?

somebody

anybody

nobody

everybody

7. You must find ... who can help you.

somebody

anybody

nobody

everybody

8. ... knew anything about America before Columbus discovered it.
somebody
anybody
nobody
everybody

9. I saw ... in the train yesterday who looked like you.
somebody
anybody
nobody
everybody

10. There is ... in the next room. I don't know him.
somebody
anybody
nobody
everybody

11. Please tell us the story. ... knows it.
somebody
anybody
nobody
everybody

12. Is there ... in my group who lives in the dormitory?
somebody
anybody
nobody
everybody

13. Has ... here got a red pencil?
somebody
anybody
nobody
everybody

14. ... can answer this question. It is very easy.
somebody
anybody
nobody
everybody

READING

Read and translate the text.

TEXT B: «OIL SERVICING»

The oil is delivered by an oil servicing truck to the oil tank of each engine through the tank filler necks. The filler necks must be provided with protective gauzes while dispensing guns and their filters must be clean.

Oil drain from the oil tank is performed across a drain plug of the feathering pump and through the valve arranged on the booster pump. From the oil cooler oil is drained across the valve on the engine front casing, the valve on the inlet tube of the booster pump, across the filter of the front casing and filter of the rotor governor.

WORD LIST

1. *servicing* – обслуговування
2. *to deliver* – постачати, передавати
3. *oil servicing truck* – маслозаправник
4. *filler neck* – заливна горловина
5. *to provide with* – забезпечувати
6. *protective gauze* – захисна сітка
7. *dispense gun* – розподільний пістолет
8. *drain valve* – зливний кран
9. *to perform* – приводити в дію, здійснювати
10. *feathering pump* – флюгерний насос
11. *to arrange* – розташовувати
12. *booster pump* – насос, що підкачує
13. *oil cooler* – масляний радіатор
14. *drain plug* – зливна заглушка
15. *oil tank* – масляний бак
16. *front casing* – передній корпус
17. *inlet tube* – впускний патрубок
18. *governor* – регулятор

Exercise 15.10. Answer the questions:

1. What is the oil delivered by?
2. Where is the oil delivered by an oil servicing truck?
3. What must the filler necks be provided with?
4. Where is the drain valve arranged?

READING

Read and translate the text

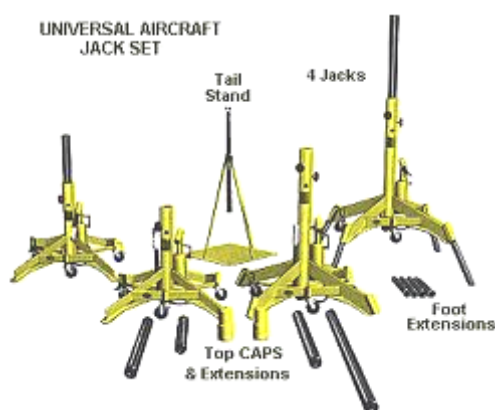
TEXT C: «TOOLS»

A complete range of first quality aviation mechanic tools which help to handle maintenance and repair work on any and all types of aircraft. Tools include socket wrenches and combination wrench; torque wrenches, screw drivers, pliers, gear pullers, tool chests, plus a wide range of special tools for aviation work.



Screw driver and pliers

For example, an aircraft jacks provide stability and function when repairing, maintaining and lifting an aircraft. An aircraft jack does not interfere with gear doors, tires, linkages, and aircraft components, which saves time. Jacks are available for most all aircraft.



Rivet Tools

During the assembly of an aircraft, builders use thousands of solid rivets, which are heavy to hold the aircraft frame together. Builders use a rivet gun which can be hydraulic, pneumatic or electromagnetic.

Drill Tools

When assembling an aircraft, precise holes must drill into the aircraft in order to place the rivets.

WORD LIST

1. *range* – асортимент
2. *tool* – інструмент
3. *to handle* – виконувати, проводити
4. *maintenance* – технічне обслуговування
5. *repair work* – ремонтні роботи
6. *socket wrench* – торцевий гайковий ключ
7. *combination wrench* – комбінований гайковий ключ
8. *torque wrench* – тарований ключ
9. *screw driver* – викрутка
10. *pliers* – плоскогубці
11. *gear puller* – знімач для шестерень

12. *tool chest* – ящик для інструментів
13. *aircraft jack* – підйомник
14. *to interfere* – шкодити, впливати
15. *gear door* – стулка шасі
16. *tire* – пневматика
17. *linkage* – проводка системи управління
18. *rivet* – заклепка
19. *solid* – масивний
20. *frame* – планер
21. *rivet gun* – пристрій для клепки
22. *drill* – дрель
23. *hole* – отвір

Exercise 15.11. Questions for discussion:

1. What helps to handle maintenance and repair work?
2. What do the tools include?
3. What is the aircraft jack used for?
4. Have you ever used these tools?

Exercise 15.12. Translate into English.

1. Під час ремонту літального апарата використовують такі інструменти, як торцевий гайковий ключ, підйомник, плоскогубці, дрель, комбінований гайковий ключ та багато інших.
2. Пристрій для клепки завжди використовують виробники літальних апаратів.
3. Підйомник використовують для всіх видів літальних апаратів.
4. Отвори в літальному апараті обов'язково повинні бути там, де розташовані заклепки, саме для цього використовують такий інструмент, як дрель.

Exercise 15.13. Give Ukrainian equivalents.

Repair work, a wide range of special tools, to hold the aircraft frame together, the structure's frame, solid rivets, the aircraft jacks, screw driver

Exercise 15.14. Insert much or many.

1. Please don't put ... pepper on the meat.
2. There were ... plates on the table.
3. I never eat... bread with soup.
4. Why did you eat so ... ice-cream?
5. She wrote us ... letters from the country.
6. ... of these students don't like to look up words in the dictionary.
7. ... in this work was too difficult for me.
8. ... of their answers were excellent.
9. ... of their conversation was about the institute.
10. There are ... new pictures in this room.

Exercise 15.15. Translate into English.

1. Дехто з нас не зміг прийти вчасно.
2. Цей письменник написав приблизно книжок 20.
3. Він узяв трохи грошей і пішов у магазин.
4. Хтось надіслав листівку з Лондона.

5. У цьому диктанті я не зробив жодної помилки.
6. Прошу: не бери тут нічого.
7. Хочете кави? – Дякую, я не хочу нічого.
8. Не стукайте: там нікого немає.
9. Хто-небудь бачив, як вона пішла?
10. Я нічого не розумію! Поясніть мені все, будь ласка.

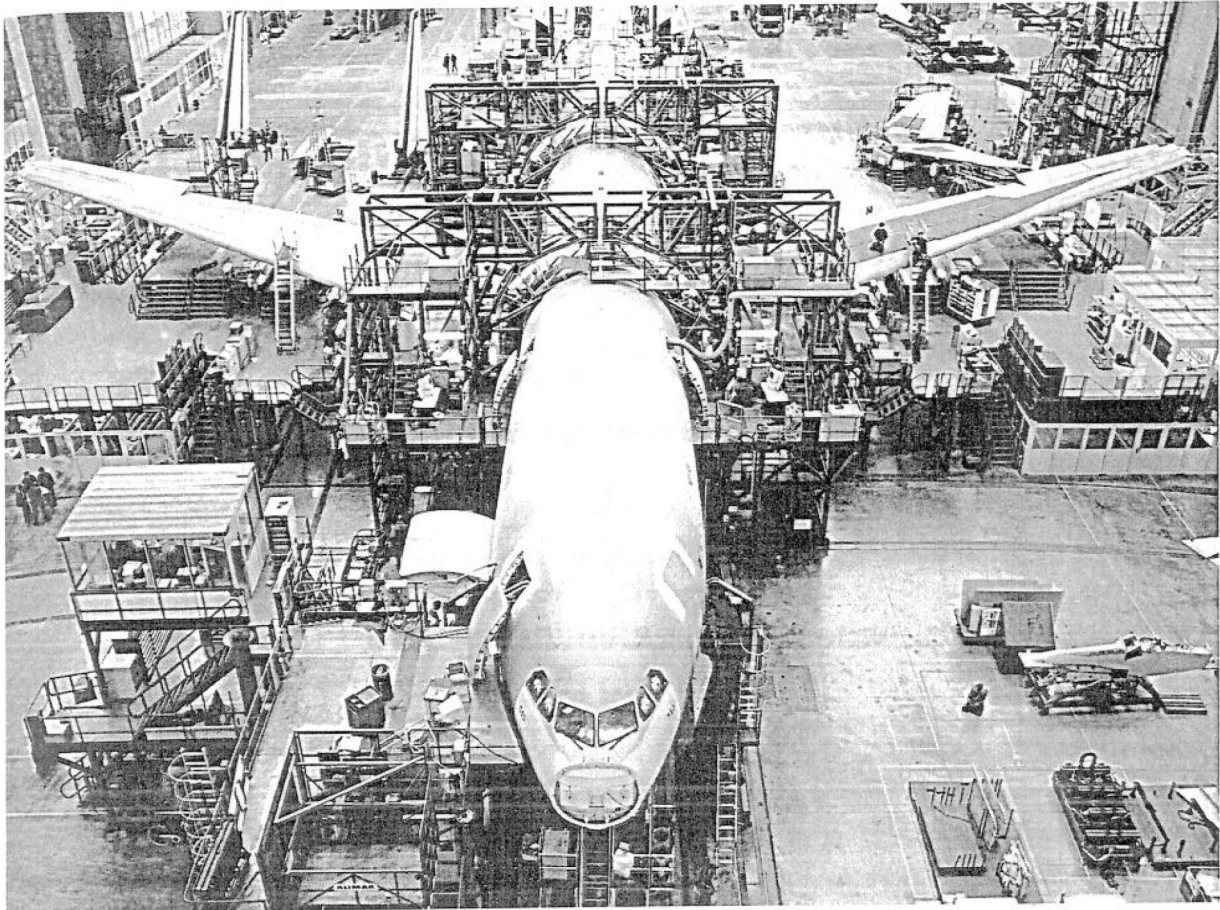
TEST UNIT 15

1. Topical test.

1. The oil is delivered by _____
 a) a petroleum servicing tank
 b) oil servicing truck
 c) gas servicing truck
2. It is delivered to the oil tank of each _____
 a) engine
 b) pump
 c) filter
3. Oil is delivered through _____
 a) the tank filler necks
 b) valves
 c) dispensing guns
4. The filler necks must be provided with _____
 a) protective plugs
 b) protective covers
 c) protective gauzes
5. The filter must be _____
 a) dry
 b) clean
 c) wet
6. Oil drain from the oil tank is performed across _____ of the featuring pump
 a) a drain plug
 b) filler neck
 c) protective gauzes
7. It is performed throught the _____
 a) plug
 b) dispensing gun
 c) valve
8. The valve is arranged on the _____
 a) booster pump
 b) oil pump
 c) transfer pump
9. From the _____ oil is drained across the valve on the engine front casing
 a) drain valves
 b) oil cooler
 c) filler neck

10. There is a valve on _____ tube of the booster pump
- inlet
 - outlet
 - back

2. Look at the photograph carefully. In the background on the left you will see what appear to be the vertical stabilizer and rudder. In the background center-right you will see the horizontal stabilizer. Write complete sentences or questions below.



Use the present continuous passive form for each verb given

- What.....in this picture? (DO)
- The wingsto the center section integral with the fuselage. (JOIN)
In this picture the wingsinto place (MOVE).
- At the same time, the wing skins of the right hand wing.....(VISUALLY INSPECT) for signs of defects or other anomalies.
- Inside, electric cables in the underfloor areas. (INSTALL)
- In addition, fuselage junctions.....(INSPECT or CHECK)
- Hinges..... (TEST) for performance and reliability.
- Several engineers..... (CONSULT) for their opinion.
- Four or five technicians..... (GIVE) final details concerning wing mounts.

UNIT 16. FIRE EXTINGUISHING SYSTEM. LIVING MACHINES

Exercise 16.1. Read the text below.

WORLD'S FIRST "LIVING MACHINES"

What happens when you take cells from frog embryos and grow them into new organisms that were "evolved" by algorithms? You get something that researchers are calling the world's first "living machine".

1 _____

Though the original stem cells came from frogs, these so-called xeno-bots don't resemble any known amphibians. The tiny blobs measure only 0,04 inches (1 millimeter) wide and are made of living tissue that biologists assembled into bodies designed by computer models, according to a new study. These mobile organisms can move independently and collectively, can self-heal wounds and survive for weeks at a time, and could potentially be used to transport medicines inside a patient's body.

2 _____

"They are neither a traditional robot nor a known species of animal", study co-author Joshua Bongard, a computer scientist and robotics expert at the University of Vermont, said in a statement. "It's a new class of artifact: a living, programmable organism"

3 _____

Algorithms shaped the evolution of the xenobots. "They grew from skin and heart stem cells into tissue clumps of several hundred cells that moved in pulses generated by heart muscle tissue" said lead study author Sam Kriegman, a doctoral candidate studying evolutionary robotics in the University of Vermont's Department of Computer Science, in Burlington.

4 _____

The study authors then pieced stem cells together to form self-powered 3D shapes designed by the evolution algorithm. Skin cells held the xenobots together, and the beating of heart tissue in specific parts of their "bodies" propelled the bots through water in a petri dish for days, and even weeks at a stretch, without needing additional nutrients, according to the study. The "bots were even able to repair significant damage", said Kriegman.

5 _____

Creations that blur the line between robots and living organisms are popular subjects in science fiction. "The prospect of so-called living robots and using technology to create living organisms understandably raises concerns for some", said Levin. That fear is not unreasonable. When we start to mess around with complex systems that we don't understand, we're going to get unintended consequences. If humanity is going to survive into the future, we need to better understand how complex properties, somehow, emerge from simple rules.

Exercise 16.2. Match choices (A-H) to (1-5). There are three choices you do not need to use. Write your answers on the separate sheet.

- A. Threat of living robots
- B. Awareness of some essential things
- C. The behavior of the tiny organisms
- D. Description of the experiment carried out with xenobots
- E. The uniqueness of xenobots
- F. Discovery of tiny machines
- G. Xenobots are similar to some amphibians
- H. The growth and development of living machines

GRAMMAR

Прикметник (The Adjective)

Прикметник виражає ознаку, якість або властивість предметів, явищ та істот і відповідає на запитання *який?* (what?)

a green bench, a blue shirt, a new dress.

Ступені порівняння прикметників

1. В англійській мові прикметники не змінюються ні за родами, ні за числами, ні за відмінками. Вони змінюються лише за ступенями порівняння. Якісні прикметники мають **звичайну форму** (the Positive Degree), **вищий ступінь порівняння** (the Comparative Degree) і **найвищий** (the Superlative Degree).

2. Форми вищого і найвищого ступенів порівняння прикметників можуть бути, як і в українській мові, **простими і складеними**.

3. Прості форми ступенів порівняння утворюються додаванням до звичайної форми закінчення **-er** у вищому ступені та **-est** — у найвищому.

В англійській мові прості форми ступенів порівняння мають:

Звичайна форма	Вищий ступінь	Найвищий ступінь
усі односкладові прикметники:		
deep	deeper	the deepest
short	shorter	the shortest
cold	colder	the coldest
двоскладові прикметники, що закінчуються на -y, -er, -le, -ow:		
easy	easier	the easiest
clever	cleverer	the cleverest
narrow	narrower	the narrowest
simple	simpler	the simplest

двоскладові прикметники з наголосом на другому складі:		
polite	politer	the politest

This river is deeper than the Dniester. – Ця річка глибша за Дністер.

It is the deepest river in Ukraine. – Це найглибша річка в Україні.

4. При утворенні простих форм ступенів порівняння дотримуються таких правил орфографії:

а) якщо прикметник закінчується на **-е**, то перед закінченнями **-er**, **-est** воно випадає:

brave – braver – the bravest;

б) в односкладових прикметниках перед закінченнями **-er**, **-est** кінцева приголосна подвоюється, якщо перед нею стоїть короткий голосний звук:

big – bigger – the biggest;

в) якщо прикметник закінчується на букву **-у** з попереднім приголосним, то перед **-er**, **-est** у змінюється на **i**:

busy – busier – the busiest.

5. Складені форми утворюються за допомогою слів **more** (більш) для вищого і **the most** (найбільш) для найвищого ступеня.

6. Складені форми ступенів порівняння мають усі багатоскладові прикметники і двоскладові з наголосом на першому складі, крім тих, що закінчуються на **-у**, **-er**, **-le**, **-ow**:

Звичайна форма	Вищий ступінь	Найвищий ступінь
difficult	more difficult	the most difficult
active	more active	the most active
useful	more useful	the most useful
beautiful	more beautiful	the most beautiful

This task is more difficult than task 2. – Це завдання більш складне, ніж друге завдання.

This is the most difficult task I have ever done. – Це найбільш складне завдання, яке я коли-небудь виконував.

7. Ступені порівняння деяких прикметників в англійській мові, як і в українській, утворюються від інших коренів:

Звичайна форма	Вищий ступінь	Найвищий ступінь
good – гарний	better – кращий	the best – найкращий
bad – поганий	worse – гірший	the worst – найгірший
little – маленький	less – менший	the least – найменший
much/many – багато	more – більше	the most – найбільше

old – старший	older – старший elder – старший (із членів родини)	oldest – найстарший eldest – найстарший (із членів родини)
far – далекий	farther – більш далекий (про відстань) further – більш далекий, подальший	farthest – найдальший (про відстань) furthest – найдальший

Your pen is better than mine. – Ваша ручка краща, ніж моя.

This is the worst film of the month. – Це найгірший фільм у цьому місяці.

He is my elder brother. – Він мій старший брат.

The child was playing in the farthest corner of the garden. – Дитина грала у найдальшому куточку садка.

8. Порівняння:

а) при порівнянні предметів вживається сполучник **than**:

This book is more interesting than that one. – Ця книга більш цікава, ніж та.

Your flat is less comfortable than his. – Ваша квартира менш комфортабельна, ніж його;

б) для порівняння двох предметів однакової якості вживається прикметник у звичайному ступені, який ставиться між подвійним сполучником **as...as** (такий..., як), **not so...as** (не такий..., як):

He is as tall as his father. – Він такий же високий, як і його батько.

She is not so tall as Ann. – Вона не така висока, як Анна.

Ступені порівняння прислівників.

Прислівники способу дії та деякі інші мають ступені порівняння, які утворюються так само, як ступені порівняння прикметників. Але у найвищому ступені вони ніколи **не використовуються з артиклем the**.

Звичайна форма	Вищий ступінь	Найвищий ступінь
а) усі односкладові прислівники утворюють вищий ступінь додаванням до звичайної форми закінчення -er у вищому ступені та -est – у найвищому:		
fast	faster	fastest
hard	harder	hardest
soon	sooner	soonest
early	earlier	earliest

б) прислівники, які закінчуються на -ly, утворюють вищий ступінь за допомогою слова more і найвищий – за допомогою слова most:		
usually	more usually	most usually
attentively	more attentively	most attentively
correctly	more correctly	most correctly

Деякі прислівники, як і відповідні прикметники, утворюють ступені порівняння від іншого кореня:

Звичайна форма	Вищий ступінь	Найвищий ступінь
good – добре	better – краще	best – найкраще
badly – погано	worse – гірше	worst – найгірше
much/many – багато	more – більше	most – найбільше
little – мало	less – менше	least – найменше
far – далеко	farther, further – далі	farthest, furthest – якнайдалі

READING

Read and translate the text.

TEXT A: «FIRE EXTINGUISHING SYSTEM»

The fire extinguishing system is used for the detection fire and fire suppression in the engines compartments, main gearbox compartment, service fuel tank and APU compartments and kerosene heater compartment. There are two portable fire extinguishers, one in the passenger compartment and one in the cockpit. One extinguisher is installed on the web of frame N 5, the other one on the right cargo door.



The fire extinguishing system consists of the fire extinguishing agent containers, the distribution lines, a control circuit, and indicating lights. The extinguishing agent is dispensed to the areas by operating the selected fire control.

In case of fire in one of the compartments, the fire warning system comes activated. When fire in any compartment is suppressed, the warning light indicating the fire

in that compartment goes off, but on the left instrument panel the warning light “FIRE” remains on and should go off only after the “FIRE WARNING OFF” button is pressed.

In case of fire in any compartment, the voice information reporting system comes into operation automatically, and information about the fire is automatically transmitted to the ground controller through the VHF radio.

In case of a fire in the engine compartment, shut down the engine using the fuel fire shut-off valve, monitor the situation to ensure that the fire is out, and make an emergency descend and landing.

In case of a fire in the main gearbox compartment, monitor the situation to ensure that the fire is out, and make an emergency descend and landing.

In case of a fire in the kerosene heater compartment, shut down the kerosene heater and make an emergency descend and landing.

WORD LIST

- 1. fire extinguishing – протипожежний***
- 2. fire suppression – погашення вогню***
- 3. compartment – відсік, відділення***
- 4. service fuel tank – витратний бак***
- 5. portable fire extinguisher – переносний вогнегасник***
- 6. to install – установлювати***
- 7. frame – шпангоут***
- 8. cargo door – двері вантажного відсіка***
- 9. extinguishing agent – вогнегасна суміш***
- 10. distribution line – розподільча лінія***
- 11. control circuit – ланцюг управління***
- 12. indicating light – світловий сигналізатор***
- 13. fire warning system – система вогнегасної сигналізації***
- 14. location – місце розташування***
- 15. to suppress – зупинити***
- 16. voice information reporting system – голосовий інформатор***
- 17. to transmit – передавати***
- 18. ground controller – наземний диспетчер***
- 19. VHF (very high frequency) radio – УКВ – радіостанція метрового діапазону***
- 20. to shut down – вимкнути***
- 21. fuel fire shut-off valve – паливний перекривний пожежний кран***
- 22. to monitor – стежити***
- 23. to ensure – забезпечувати, гарантувати***
- 24. emergency descend – аварійне зниження***

Exercise 16.3. Answer the questions:

1. What does the fire extinguishing system consist of ?
2. How many the portable fire extinguisher has the fire extinguishing system?
3. When does the fire warning system come activate? How does it work?
4. Where does the extinguishing agent dispense?
5. When does reporting system come into operation?

Exercise 16.4. Match English and Ukrainian equivalents.

A	B
1. the fire detection system	a) гідравлічний перекривний кран
2. fixed system	b) наземна панель управління ДСУ
3. fire extinguishing agent container	c) контейнер із вогнегасним складом
4. the upper instrumental panel	d) стаціонарна система
5. hydraulic shut off valve	e) система виявлення пожежі
6. APU ground control panel	f) верхня приборна доска
7. the generator control relay	g) вогнегасна речовина із вибраного контейнера
8. the extinguishing agent from selected container	h) реле управління генератора
9. engine fire warning indicator	i) система попередження про пожежу в двигуні

Exercise 16.5. Complete the sentences with the words from the text.

1. The fire extinguishing system is used for _____
2. There are two portable fire extinguishers, one in _____ and one in _____
3. When fire in any compartment is _____, the warning light indicating the fire in that compartment _____
4. The voice informer comes into operation automatically, and information about the fire is _____
5. Shut down the engine using _____ to ensure that the fire is out, and make an emergency _____

Exercise 16.6. Give English equivalents.

Паливний перекривний пожежний кран, погашення вогню, вогнегасний склад, УКВ-радіостанція метрового діапазону, розподільча лінія, голосовий інформатор, стежити, у випадку виникнення вогню.

Exercise 16.7. In the list below find a definition for the given words.

A	B
1. fire extinguisher	a) an unload small turbine (jet) engine which provides air and electricity to the aircraft systems. It is often located of the rear of the fuselage
2. circuit	

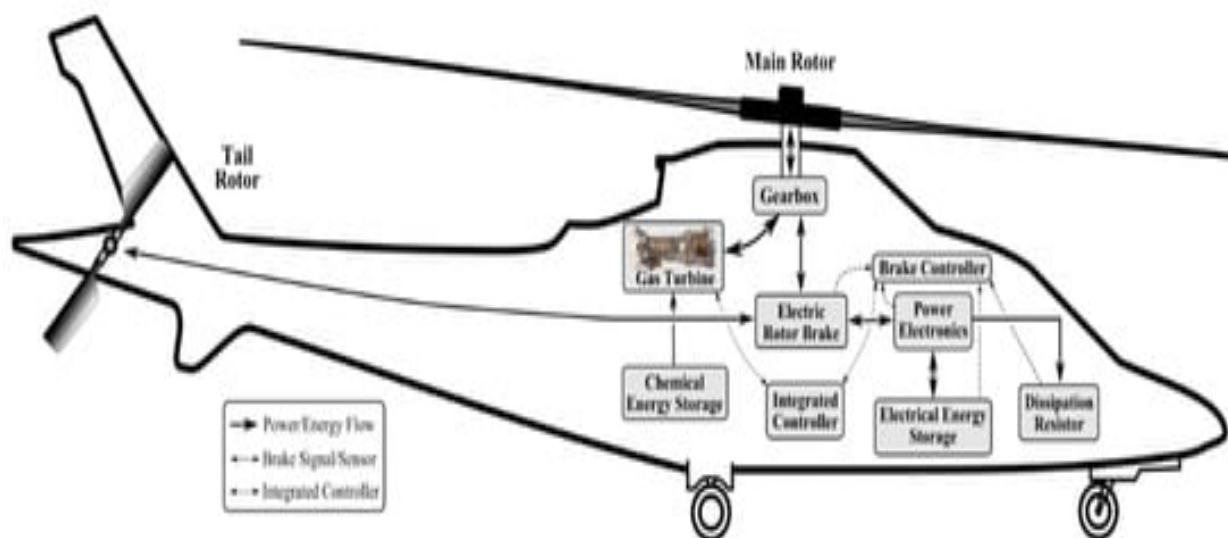
3. Auxiliary Power Unit 4. cockpit 5. crossfeed 6. generator 7. pneumatic 8. passenger 9. rotation	b) containers which are filled with water, chemical or gas for suppressing fire in the aircraft c) the complete path of an electrical or electronic network d) electrical power source, normally engine driven on board the aircraft e) control area or Flight Desk from which the pilots operate the aircraft f) it allows fuel to equally distributed between sing tanks and engines in flight g) relating to a system which uses compressed air h) the act of revolving i) any person carried on board an aircraft who is not part of the operating crew
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READING

Read and translate the text.

TEXT B: «ELECTRICAL POWER SYSTEM»

ELECTRICAL SYSTEM The helicopter is equipped with a 28 VDC electrical system. Power for this system is obtained from a nickelcadmium 24 volt, 17 ampere-hour battery and a 30 volt, 200 ampere starter-generator. Major components of the DC power system include the battery, starter-generator, voltage regulator, relays, 28 VDC bus, and circuit breakers. All circuits in the electrical system are single wire with fuselage common ground return.



The aircraft electrical system consists of 115 V AC power generation and distribution system and 28 V DC power system. Two 115/200 V, 400 Hz. 3-phase generators are installed one on each engine. A third generator of the same type is driven by the

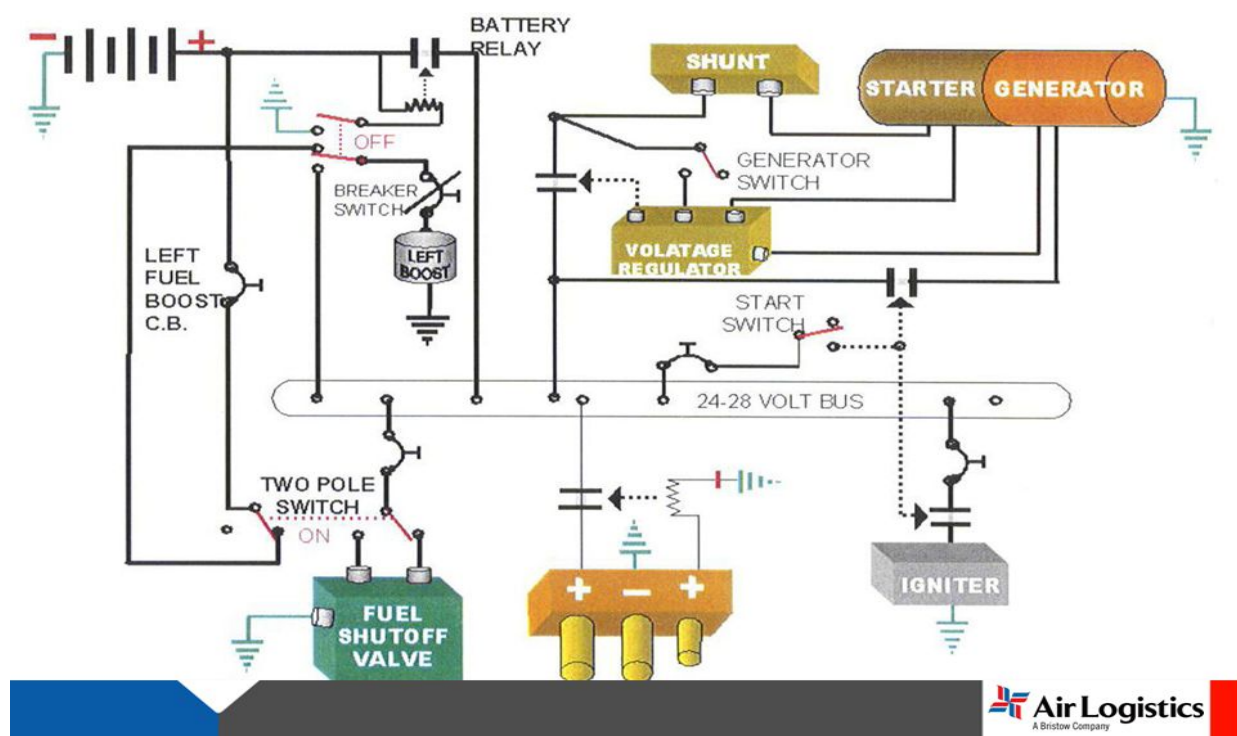
APU. 115 V AC power is converted to 28 V DC power by four transformer-rectifiers. For instruments and radio power, 115 V AC is reduced to 28 V DC by single-phase transformers.

On the ground it is also possible to supply the AC system by external 115 V AC power and the APU starting system by external 28 V DC power.

Power for a 28 V DC battery system is supplied by two in series connected 14 V nickel-cadmium batteries. A battery charger, powered from AC ground service bus, maintains the batteries in a charged condition. An inverter, powered from the battery system, supplies single-phase, 115 V, 400 Hz, AC power for emergency use when all other sources of AC power have been lost.

The electrical system is designed to provide adequate protection against any reasonable combination of malfunction.

Electrical system controls and indicators are located on the cockpit overhead panel.



WORD LIST

1. AC – alternating current – змінний струм
2. APU (Auxiliary Power Unit) – ДСУ (допоміжна силова установка)
3. battery charger – зарядний пристрій акумулятора
4. to convert – перетворювати
5. DC – direct current – постійний струм
6. distribution – розподіл
7. drive – привід, передача
8. nickel-cadmium – нікель-кадмієвий
9. emergency – критичне становище, надзвичайний стан
10. external – зовнішній

11. *generating* – створення, генерування
12. *inverter* – перетворювач
13. *to maintain* – підтримувати, обслуговувати
14. *malfunction* – несправність
15. *to reduce* – зменшувати
16. *relay* – передавати, реле
17. *to transform* – перетворювати
18. *transformer-rectifier* – трансформатор-випрямляч
19. *overhead panel* – верхня приборна панель (пульт)

Exercise 16.8. Answer the questions:

1. What does the aircraft electrical system consist of?
2. What is the third generator driven by?
3. What is power for a 28 V DC battery system supplied by?
4. What is the function of the transformer-rectifiers?
5. Where are electrical system controls and indicators located?
6. What is the power for instruments and radio?
7. What does a battery charger maintain?
8. What is the electrical system designed for?
9. Where are 3 phase generators installed?

Exercise 16.9. Are the sentences true or false? Correct the false ones.

1. On the ground it is also possible to supply the AC system by internal 115 V AC power.
2. Two 115/200 V 400 Hz, single phase generators are installed one on each engine.
3. Electrical system controls and indicators are located on the cockpit overhead panel.
4. A battery charger is powered from AC ground service bus.
5. Inverter is powered from AC ground service bus.

Exercise 16.10. Match English and Ukrainian equivalents.

A	B
1. alternative current	a) система електроживлення
2. for emergency use	b) змінний струм
3. overhead panel	c) постійний струм
4. in series connected	d) для аварійного використання
5. direct current	f) верхній пульт
6. in a charged condition	g) послідовне з'єднання
7. electrical system	h) у зарядженому стані
8. APU (auxiliary power unit)	i) такого ж типу
9. to provide adequate protection	j) щоб забезпечити адекватний захист
10. of the same type	e) ДСУ

Exercise 16.11. In the list below find a definition for the given words.

A	B
<ol style="list-style-type: none"> 1. indicator 2. Engine 3. Control 4. Emergency 5. Batteries 6. Generator 7. electric current 8. cockpit 9. transformer 10. protection 	<ol style="list-style-type: none"> a) a device or mechanism for operating a car, aircraft, etc. b) any device that converts one form of energy into another form c) the compartment in an aircraft in which the pilot, crew, and sometimes the passengers sit d) any machine designed to convert energy, esp. heat energy, into mechanical work e) the act of protecting or the condition of being protected f) an instrument that displays certain operating condition in a machine, such as a gauge showing temperature, speed, pressure g) a device that transfers an alternating current from one circuit to one or more other circuits, usually with an increase or decrease of voltage h) a flow of electric charge through a conductor i) two or more primary cells connected together, usually in series, to provide a source of electric current j) an unforeseen or sudden occurrence, esp. of a danger demanding immediate remedy or action

Exercise 16.12. Complete the sentences with the words from the text.

- 1) The aircraft electrical system consists of 115 V AC power _____ distribution system
- 2) Power for a 28 V DC battery system is supplied by _____
- 3) AC power for emergency use when all others _____ have been lost
- 3) A third generator of the same type is _____ by the APU
- 4) The electrical system is designed to provide _____ protection
- 5) On the ground it is also _____ to supply the AC system by external 115 V AC power

READING

Read and translate the text.

TEXT C: «FIRE EXTINGUISHING PROCEDURE»

In case of an engine fire (fire is indicated by the warning lamp or noticed from the cabin), proceed as follows:

1. Immediately stop the engine by feathering the rotor as instructed under “Stopping the Engine in Flight”.
2. Close the engine fuel shut-off valve.
 1. Switch off air bleed from the engine on fire.
 2. Extinguish the fire by following the directions set forth in the aircraft operating instructions.

CAUTIONS:

- 1) DO NOT start the engine after the fire has been put out.
- 2) In case engine has been on fire, it is not allowed to use it for further service and it must be sent for overhauling.
3. If fire-smothering compound has got inside the front casing and turbine shaft tunnel of an operative engine, the engine concerned is fit for further service, provided the following operating are carried out not later than in 1 or 2 hours:
 - a) disconnect the aircraft fire- extinguishing pipeline from the cut-off valve union. Disconnect the pipelines from the centrifugal breather and combustion chamber casing, having previously removed the clamps. Remove the gaskets from the breather and combustion chamber casing flange. Taking care not to damage the electrical wiring, turn the pipeline together with the cut-off valve so as to put it in a convenient position and remove the valve spring support, valve and spring. Wash the spring support, valve, spring and valve inside; then oil them. Assemble the cut-off valve, placing a new paronite gasket, coated with grade 50 jointing compound, under the spring support. Reinstall the pipelines, using new paronite gaskets, coated with grade 50 jointing compound, under the spring valve.
 - b) after the aircraft fire-extinguishing system is reassembled, drain all oil from the engine, oil tank and aircraft system;
 - c) fill the oil tank with fresh oil heated to 50-70 degrees;
 - d) crank the engine and refill the oil tank;
 - e) start the engine and run it for 15 minutes, moving the engine control level three from the idle to the nominal rating position
 - f) stop the engine and drain all oil from the engine and aircraft system again;
 - g) fill the oil system with fresh oil;
 - h) start the engine and run it for 15 minutes as instructed;
 - i) drain oil from the engine and aircraft system;
 - j) fill the oil tank with fresh oil and prime the engine oil system by cranking the engine. Now the engine is ready for further service.

WORD LIST

1. *air bleed* – відбір повітря
2. *to assembly* – збирати
3. *backing section* – секція підживлення
4. *to be on fire* – горіти
5. *to carry out* – виконувати
6. *casing* – обшивка
7. *cautions* – обережність, застереження
8. *centrifugal breather* – центробіжний суфлер
9. *clam* – затиск, хомут, скоба, клема
10. *coated with* – покритий
11. *combustion chamber* – камера згорання
12. *concerned* – відповідний
13. *to crank* – розкрутити
14. *cut-off valve* – відсічний клапан
15. *detrimental effect* – шкідлива дія
16. *direction* – вказівка, інструкція
17. *to discharge* – розряджати
18. *electric wiring* – електропроводка
19. *to eliminate* – усувати
20. *to feather* – флюгувати
21. *fire extinguishing bottle* – протипожежний балон, вогнегасник
22. *fire extinguishing compound* – вогнегасна суміш
23. *to fit* – підходити
24. *flange* – фланець, кромка
25. *fuel-shut-off valve* – пожежний кран
26. *gasket* – прокладка, ущільнення
27. *grade* – клас, сорт
28. *to reinstall* – повторно встановити
29. *idle* – малий газ, холостий хід
30. *inlet connection* – вхідне приєднання
31. *jointing compound* – герметизуюча маса, герметик
32. *to lock* – закривати, встановлювати на упор
33. *nominal rating* – номінальний режим
34. *to oil* – мастити маслом
35. *oil tank* – масляний бак
36. *operating instruction* – інструкція з експлуатації
37. *operative* – працюючий
38. *overhauling* – капітальний ремонт
39. *owing to* – через, унаслідок, із причин, дякуючи
40. *paronite* – паронит
41. *penetration* – потрапляння
42. *pipeline* – трубопровід
43. *previously* – наперед, попередньо

44. *to prime* – запалювати, заправляти
 45. *to proceed* – продовжувати, діяти
 46. *rotor* – гвинт
 47. *to put out* – гасити (пожежу)
 48. *to reassemble* – знову збирати
 49. *service log* – формуляр
 50. *shaft* – вал
 51. *spring* – пружний елемент
 52. *tunnel* – аеродинамічна труба, прохід, тунель
 53. *turbine* – турбіна

Exercise 16.13. Answer the questions:

1. What procedures should be preceded in case of an engine fire?
2. How can the engine be stopped?
3. The engine should be started after the fire has been put out, shouldn't it?
4. Is it allowed to use the engine for further service if it has been on fire?
5. What procedures should be carried out if the fire-extinguishing bottles have discharged without a fire in the engine?

Exercise 16.14. Match English and Ukrainian equivalents.

A	B
1. fire extinguishing	a) вкритий
2. warning lamp	b) шкідлива дія
3. fuel shut-off valve	c) пожежний клапан
4. air bleed	d) вогнегасна суміш
5. set sort	e) гасіння пожежі
6. operating instruction	f) вхідне приєднання
7. put out	g) гасити
8. be on fire	h) бортжурнал
9. fire extinguishing bottle	i) центробіжний суфлер
10. owing to	Л) відбір повітря
11. fire-smoothing compound	k) електропроводка
12. carry out	l) масляний бак
13. centrifugal breather	m) сигнальна лампа
14. combustion chamber	n) зливний кран
15. electric wiring	o) вогнегасник
16. valve spring	p) герметик
17. coated with	q) ручка управління
18. jointing compound	r) виробляти
19. drain valve	s) формулювати
20. backing section	t) пружина клапана
21. inlet connection	u) завдяки
22. oil tank	v) інструкція з експлуатації
23. control level	x) секція живлення
24. detrimental effect	y) камера згорання
25. Log Book	z) горіти

Exercise 16.15. Read the sentences below. Complete the sentences with correct form of the word in bracket. Write your answers in the spaces. An example (0) has been done for you.

They made these chocolate bars smaller (small).

It's the most beautiful (beautiful) building in the word.

1. Can't you think of anything _____ (intelligent) to say.
2. That was the _____ (funny) film I've ever seen.
3. Well, the place looks _____ (clean) now.
4. It was the _____ (horrible) feeling I've ever had.
5. Janet looks _____ (thin) than she did.
6. You need to draw it _____ (carefully).
7. It's the _____ (large) company in the country.
8. The weather is getting _____ (bad).
9. It was the _____ (boring) speech I've ever heard.
10. The programme will be shown at a _____ (late) date.

Exercise 16.16. Open the brackets using the appropriate adjective form.

1. We should eat (healthy) food.
2. Today the streets aren't as (clean) as they used to be.
3. It's (bad) mistake he has ever made.
4. This man is (tall) than that one.
5. Asia is (large) than Australia.
6. The Volga is (short) than the Mississippi.
7. Which building is the (high) in Moscow?
8. Mary is a (good) student than Lucy.
9. The Alps are (high) than the Urals.
10. This garden is the (beautiful) in our town.
11. She speaks Italian (good) than English.
12. Is the word "newspaper" (long) than the word "book"?
13. The Thames is (short) than the Volga.
14. The Arctic Ocean is (cold) than the Indian Ocean.
15. Chinese is (difficult) than English.

Exercise 16.17. Put the ending to the outlined adjectives or change the form where it is essential.

1. She looks about eighteen but she is much **old** ____ than she looks.
2. It took me **long** ____ to get there than her.
3. He says that his car is **good** ____ than mine.
4. He is the **good** ____ player in the team.
5. Summer is **warm** ____ than spring.
6. Which of the three seasons is **the hot** ____?
7. Your work is **good** ____ than I thought.
8. It is the **old** ____ buildings in the city.
9. Your plan is **the bad** ____.
10. Their flat is **large** ____ than ours.

TEST UNIT 16

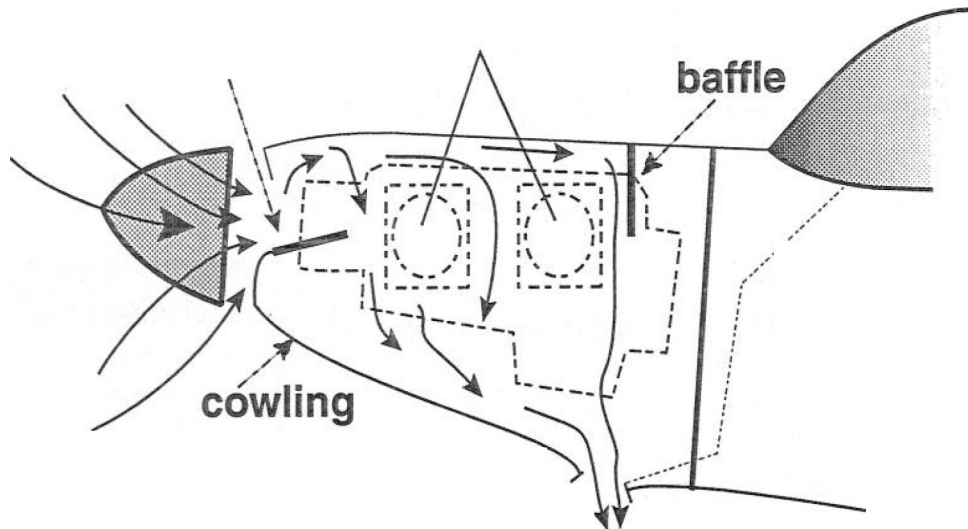
1. Fill in the blanks using verbs in the table.

Prevent, happen, occur, cool, provide, drive, heat up, transform, convert

The piston engine (1) _____ the propeller and thus (2) _____ chemical energy of the fuel into heat and pressure energy through combustion with air. Heat and pressure energy are (3) _____ into mechanical energy needed to (4) _____ the propel-

ler. But the engine (5) _____, leading to high engine temperatures. In some engines, it is airflow which (6) _____ the engine. Cylinders are fitted with cooling fins which increase the exposed surface area, allowing better cooling. Uneven cooling sometimes (7) _____. To (8) _____ this from (9) _____, certain key features are (10) _____.

2. READ THEN MATCH THE VARIOUS PARTS BELOW AND THEIR FUNCTION



Cylinder heads require constant cooling. A gauge enables the pilot to monitor closely cylinder head temperature (CHT). Not pictured are cooling fins which are mounted on cylinder heads to increase their surface area. Cowling surrounds the engine, covering it and increasing airflow. Cowling ducts are open wings aft of the propeller allowing air to enter the engine cavity and circulate. Air escapes via cowling outlets which are both fixed and variable. The latter varieties are also referred to as faired cowl flaps and can be set by the pilot to control engine cooling. In addition to cowl flaps, engine baffles distribute the air evenly around the cylinders. Cooling has a price: the open flaps cause an increase in drag called cooling

1. enables air to escape	a. cooling fins
2. increases exposed surface area	b. cowling ducts
3. covers engine and increases air	c. baffles
4. invariable air outlet	d. cowl outlet
5. indicates the temperature of the cylinder head	e. cowling
6. captures air behind the propeller	f. cooling cowl flaps
7. distributes air evenly around cylinders	g. faired cowl flaps
8. parasite drag increasing with open flaps	h. fixed cowl opening
9. enable the pilot to control engine cooling	i. cooling drag
10. allow more air to escape from engine	j. CTH gauge

UNIT 17. ANTI-ICING SYSTEM

Exercise 17.1. Five sentences have been removed from the text. Put the correct sentence from A-F below in each space to form a logical, coherent and correct text. There is one extra sentence you are not going to need. Choose the best option: A, B, C, or D, to fill the gaps.

If you look from a helicopter at any English town, you will see that the residential areas consist almost entirely of rows of small boxes, each with its own little patch of green. 1_____ The principle, however, will be clear: the English all want to live in their own private houses with their own private gardens. What you cannot see from your helicopter, you will learn as soon as you try to visit an English home. 2_____ Some humorists claim this is the result of 'a conspiracy to mislead foreigners', pointing out that our streets are never straight, every time a street bends, it is given a different name, there are at least 60 confusing synonyms for 'street', and the numbering of the houses is hopelessly illogical.

The house numbers are at least as well camouflaged as the street names. 3_____ One taxi-driver explained: 'An Englishman's home is his castle, right? We can't actually have massive walls around it, but we can make it difficult to get to.'

The Englishman's home is much more than just his castle; it is also his identity and his prime obsession. 4_____ The mania for home improvements is widespread. Research shows that only 2% of English males and 12 % of females have never done any Do-It-Yourself.

Working on home improvements is an opportunity to exercise our creative talents. 5_____ Although it may sometimes be an economic necessity, we see the arrangement, furnishing and decorating of our homes as an expression of our unique personal taste.

Exercise 17.2. For questions (1-5) choose the correct answer (A, B, C, D). Write your answers on the separate answer sheet.

- A. **A** You may have its address and a map, but you will have great difficulty in finding the house you are looking for.
- B. **B** Or at least that's how we like to think of it.
- C. **C** This is an unwritten rule of home ownership and the moving-in ritual.
- D. **D** They are either hidden, or even not there at all.
- E. **E** In better-off areas, these boxes will be further apart, and the green patches attached to them will be larger.
- G. **F** This is why a house is not something you just passively 'have', it is something you constantly 'work on'.
- H. 'work on'.
- I. War I
- J. Giving money for charity.

GRAMMAR

The Present Perfect Tense (Теперішній завершений час).

The Present Perfect Tense виражає дію, що відбулася до певного моменту або періоду в теперішньому часі (в цьому році, на цьому тижні). Хоча дієслова в the Present Perfect перекладаються українською мовою в минулому часі, слід пам'ятати, що в англійській мові ці дії сприймаються в теперішньому часі, оскільки залежать від цього часу і є результатом дії. Тобто ми вживаємо the Present Perfect Tense, коли дія, що сталася в минулому, наразі має значення.

The Present Perfect вживається для опису дій, які під час мовлення вже завершені.

У цьому випадку в центрі уваги перебуває саме завершена дія.

Для того, щоб побудувати речення в Present Perfect, необхідно поставити допоміжне дієслово to have (has) і додати основне дієслово в третій формі (V3).

have/has + Past Participle

Третю форму дієслова ще також називають дієприкметником минулого часу (past participle).

Стверджувальна форма Affirmative	Питальна форма Interrogative	Заперечна форма Negative
I have ('ve) worked You have ('ve) worked He has ('s) worked She has ('s) worked It has ('s) worked We have ('ve) worked They have ('ve) worked	Have I worked? Have you worked? Has he worked? Has she worked? Has it worked? Have we worked? Have they worked	I have not/haven't worked You have not/haven't worked He has not/hasn't worked She has not/hasn't worked It has not/hasn't worked We have not/haven't worked They have not/haven't worked

Теперішній доконаний час вживається для вираження дії, що вже завершилася на момент розмови, але її результат є видимим.

They have run too fast. They are tired now.

Вони бігли дуже швидко. Вони – втомлені. (результат бігу – втома).

Для вираження дії, точний час якої не вказується (коли саме), важливим є лише факт здійснення самої дії чи її результат.

She has read this book.

Вона прочитала цю книгу. (Дія є завершеною на момент розмови.)

Для позначення дій, які розпочалися в минулому і досі тривають.

He has been a doctor since 1991.

Він працює доктором з 1991 року (він почав працювати в 1991 році і досі працює).

Коли ми говоримо про те, що відбувається в «незавершений момент»:

today – сьогодні,

this week – на цьому тижні,

this year – в цьому році,

this month – в цьому місяці,

this decade – в цьому десятилітті,

this century – в цьому столітті,

this millennium – в цьому тисячолітті.

I have gone to the theatre today.

Я сьогодні ходила в театр (сьогоднішній день ще не скінчився).

I have finished the school this year.

Я закінчила школу в цьому році.

Обставини часу, характерні для теперішнього доконаного часу:

just (щойно), **already** (вже), **ever** (коли-небудь), **never** (ніколи), **recently** (нещодавно, останнім часом), **lately** (нещодавно, останнім часом), **yet** (ще), **since** (а того часу як), **for** (протягом), **today** (сьогодні), **this week** (month, year) (цього тижня, місяця, року), **so far** (поки що).

Обставини часу, як правило, розташовуються між допоміжним та основним дієсловом.

(just, already, ever, never тощо) або в кінці речення **(today, yet, so far, this week тощо)**.

Yet вживається тільки в заперечних та питальних реченнях.

Наприклад:

We have never been to the Zoo.

I have seen him twice this week.

He hasn't left yet.

READING

Read and translate the text.

TEXT A: «ANTI-ICING SYSTEM»

The helicopter anti-icing system prevents ice build-up on the main and tail rotor blades and defrosts the pilot and copilot windshields. The anti-icing system control unit activates the engine and rotor anti-icing systems automatically.

Standard helicopters are equipped with the warning sensor. The sensor automatically activates the rotor, windshield, and engine anti-icing system when ice is detected.

The main and tail rotor blades have electrical heating elements to prevent ice build-up on the blades. Each main rotor blade has four heating elements. Each tail rotor blade has two heating elements. The blade heating elements are controlled by the anti-icing system control box. The anti-icing system heating elements are arranged on spar nose portion. They comprise the steel plates, cemented between the glassfabric sheets.

The engine inlet and particle-separator anti-ice system uses both electrical heating elements.

The system can operate in automatic or manual mode, as selected by the crew from the flight deck. When automatic operation is selected, helicopter-furnished ice detectors will initiate system operation on all engines when icing conditions are encountered. For all manual operations, the rotor and engine anti-icing switch must be placed in the “ON” position.

When the system is “ON”, the compressor discharges and air heated by compression will flow to the anti-icing valves. From this point, the air flows to the compressor inlet anti-icing vane assembly. The compressor air inlet housing, is anti-iced by heat conduction. However, when the engine anti-icing system is turned on, air is also bled to the anti-icing inlet duct.

WORD LIST

1. *anti-icing system* – протиоожеледна система
2. *to prevent* – запобігати
3. *build-up* – накопичення
4. *tail rotor blade* – лопать кермового гвинта
5. *to defrost* – запобігання обмерзанню
6. *windshield* – лобове скло
7. *system control unit* – блок управління
8. *to activate* – вмикати, приводити в дію
9. *to equip with* – обладнати
10. *warning sensor* – датчик системи виявлення
11. *to detect* – виявляти
12. *electrical heating element* – електронагрівальний елемент
13. *control box* – пульт управління
14. *to arrange* – розташовувати
15. *spar* – лонжерон

16. *nose portion* – носова частина
17. *steel plate* – стальна пластина
18. *to cement* – скріпляти
19. *to comprise* – складатися з....
20. *glassfabric sheet* – лист із стеклотканини
21. *to operate* – управляти, експлуатувати
22. *approximately* – приблизно
23. *turn* – розворот, черга
24. *cycle* – такт, цикл, період
25. *repeat* – повторення
26. *to turn off* – виключати
27. *signaling* – передача (сигналу), сигналізуючий
28. *engine inlet* – вхідний пристрій двигуна
29. *particle separator* – пилезахисний пристрій
30. *automatic control* – автоматичне управління
31. *manual mode* – ручний режим
32. *crew* – екіпаж
33. *flight deck* – кабіна екіпажа
34. *to furnish* – забезпечувати
35. *initiate* – включати, запускати, ініціювати
36. *encount* – стикатися
37. *compressor* – компресор
38. *discharge* – розряд акумулятора
39. *compression* – стискання
40. *flow* – потік, витрата
41. *anti-icing valve* – клапан протиобмерзальної системи
42. *inlet vane assembly* – вхідна направляюча лопатка
43. *air inlet housing* – вхідний повітряний пристрій
44. *however* – і все таки
45. *to bleed (bled, bled)* – відбирати, стравлювати тиск
46. *inlet duct* – вхідний канал

Exercise 17.3. Answer the questions:

1. What is the anti-icing system used for?
2. What does the warning sensor automatically activate?
3. Where are arranged the anti-icing system heating elements?
4. When does the cycle repeat?
5. Which system uses the electrical heating elements?

Exercises:

Exercise 17.4. Match English and Ukrainian equivalents.

1. engine nose cowl	a) протиобмерзальна система
2. air temperature probe	b) механічний склоочисник
3. ice protection system	c) функція запобігання запітнінню
4. stall warning transducer	d) видалення дощових крапель
5. static port area	e) повітрозабірник
6. defogging functions	f) вхідний обтічник
7. rain removal	g) передня кромка горизонтального стабілізатора
8. windshields	h) датчик сигналізації звалення
9. inlet bullet	i) носовий капот двигуна
10. mechanical wiper	j) приймач температури повітря
11. horizontal stabilizer leading edge	k) лобове скло кабіни пілотів
12. air scoop	l) верхнє переднє скло кабіни
13. left static port area	m) лівий приймач статичної тиску
14. the clearview and eyebrow windows	n) статичний приймач

Exercise 17.5. In the list below find a definition for the given words.

A	B
1. engine	a) device that receives waves or other variations from one system and conveys related ones to another
2. pilots' windshields	b) form of energy produced by movement of molecules
3. wiper	c) feel that something may exist or be true; feel to be guilty but have no proof
4. valve	d) set of connected things that form a whole or work together
5. transducer	e) machine using fuel and supplying power
6. operate	f) device controlling flow through a pipe
7. system	g) glass in the window at the front of an aircraft
8. static	h) control the functions of smth
9. suspect	i) device that automatically wipers rain from a windscreen

Exercise 17.6. Complete the dialogue. Use the Present Perfect with just, already and yet.

Vicky: You haven't done your project yet (you / not do / your project / yet), I suppose.

Rachel: No, I haven't. _____ (I / not / start / it / yet).

Vicky: _____ (I / just / see / Andrew), and he says _____ (he / already / do) about half of it.

Rachel: Well, he works too hard.

Vicky: _____ (I / not / finish / my plan / yet).

Rachel: _____ (you / already / begin) to worry about it, haven't you? Take it easy. There's plenty of time.

Vicky: _____ (we / already / spend) too long thinking about it.
_____ (I/not/do/any real work / yet)

and _____ (I / just / realize) that there are only four weeks to the end of term.

Rachel: OK. _____ (I / just / decide) to start next week. Well, maybe.

Exercise 17.. Complete the sentences. Use for and since.

*You ought to wash the car. You haven't washed it **for** ages.*

*I'd better have a shower. I haven't **since** Thursday.*

1. I think I'll ring my girlfriend. I haven't _____ the weekend.
2. We're going to see some old friends. We haven't _____ five years.
3. Let's watch a video, shall we? We haven't _____ quite a while.
4. We could have a barbecue. We haven't _____ last summer.
5. Shall we play tennis? We haven't _____ our holiday.

Exercise 17.8. Put in the correct verb form.

I've done (I / do) all the housework. The flat is really clean now.

A young couple bought (buy) the house next door. But they didn't live there long.

1. Our visitors _____ (arrive). They're sitting in the garden.
2. There's still a problem with the television. Someone _____ (repair) it, but then it broke down again.
3. _____ (I / lose) my bank card. I can't find it anywhere.
4. The match _____ (start). United are playing well.
5. My sister _____ (run) away from home. But she came back two days later.
6. Daniel _____ (earn) some money last week. But I'm afraid he's already spent it all.
7. _____ we / plant) an apple tree in the garden. Unfortunately it died.
8. Prices _____ (go) up. Everything is more expensive this year.
9. Someone _____ (turn) on the hi-fi. What's that song called?
10. _____ (I / phone) the office at eleven to speak to the manager, but he isn't there today.

Exercise 17.9. Decide which word is correct.

I'd like to borrow this book. Has Anna read it yet?

a) done b) for c) just d) yet

1. Ben writes very quickly. He's _____ finished his essay.

a) already b) been c) for d) yet

2. What are you going to do? - I don't know. I haven't decided _____

a) just b) long c) since d) yet

3. I've _____ to London. I went there in June.

a) been b) gone c) just d) yet

4. Have you _____ done any skiing?
a) ever b) for c) just d) long
5. My boyfriend hasn't rung _____ week.
a) for b) last c) since d) this
6. I haven't seen that coat before. How _____ have you had it?
a) already b) for c) long d) since
7. The girls have _____ to the cinema. They won't be back until ten o'clock.
a) already b) been c) gone d) just
8. I haven't seen my parents _____ last Christmas.
a) already b) before c) for d) since
9. This is the first _____ I've ever lived away from home.
a) already b) since c) that d) time
10. This programme must be new. I've _____ seen it before.
a) ever b) never c) since d) yet

TEST UNIT 17

1. *One word in each sentence is in an incorrect form. Delete it, and write the word in its correct form in the space.*

For example: This is an internal ~~combustible~~ engine. combustion

- My safety helmet is made of an unbreaking plastic. _____
- The speed and accelerate of the car are measured by two sensors on the dummy.

- Suspend a heavy weight on the wire to measure the tense strength of the wire.

- Heat-resistance ceramics are used in the pistons of the racing car. _____
- When you pull copper wire with great force, the wire lengths and becomes thinner.

- GPS is a satellite system that can location a person or object to within 6 metres.

- The cable is too elasticity: when you pull it, it stretches to 150% of its length.

- If you heat this metal and then hammer it, it will deformation easily. _____

2. *Replace the underlined phrase with a word/phrase from the box that has the same or similar meaning.*

non-combustible / brace / deepen / yield point / altitude / compressive strength / resistant to / plasticity

- A powerful digger was used to increase the depth of the trench. _____
- This desert vehicle must be able to withstand extremely high temperatures.

- We increased the load on the material until the moment when it changed shape.

4. Fix a diagonal bar between the column and beam to strengthen the joint.
5. The walls of the building are made of a composite which is impossible to burn.
6. This material has great ability to deform to a new shape and stay in that shape.
7. Barometers measure air pressure and can indicate how high you are above sea level.
8. Concrete has good ability to withstand a force which presses down on it.

3. Choose the correct answers. Write a letter (a – d) in each space.

1. Just over three tenths _____ all students in this college are doing computer studies.
a) under b) from c) of d) for
2. Please use the dipstick to check _____ the oil level is OK.
a) that b) for c) and d) which
3. The radar system is not working, and _____ we don't know where all the planes are.
a) result b) therefore c) because d) since
4. Point the radar gun at that car, and the display screen will show you _____.
a) that its speed b) how fast is moving
c) how fast its speed d) how fast it is moving
5. You have to change the oil filter _____ nine months or 10,000 km, whichever is the sooner.
a) to b) since c) every d) for
6. The cables in a suspension bridge _____ when they are pulled.
a) can't broken b) aren't break
c) haven't broken d) don't break
7. The satellite orbits at a speed of 27,359 kph, _____, approximately 17,000 mph.
a) such as b) that is c) in addition d) for example
8. The purpose of the sensors is to find out _____ the temperature goes above 50°C.
a) whether b) whichever c) weather d) whatever
9. _____ the aeroplane from the control tower?
a) What distance b) What is distance
c) How far is d) How further
10. Could you please measure _____ the room before we buy the materials.
a) how long b) the length c) how long is d) the length of
11. The worker received an electric shock _____ the wires were not insulated.
a) therefore b) because c) and so d) as a result
12. _____ you use for measuring your bicycle's speed?
a) What is b) How do c) How are d) What do
13. The _____ is a sensor that measures the force which pulls the cable down.
a) sensor force tensile b) force tensile sensor
c) tensile force sensor d) sensor tensile force

4. Choose the word or phrase that most appropriately completes each sentence.

Choose the best option: A, B, C, or D, to fill the gaps.

1. I'm really hungry. Why don't we _____ a pizza?
2. I can't _____ to buy a new car. I'll just have to keep using the old one.
3. Everybody should have _____ of speech, so that they can express their opinion.
4. He was aware of the fact that he had a(n) _____ illness. The doctor told him that he only had three more months to live.
5. Mike was _____ to buy a present for Angie's birthday but he forgot.
6. I'd like to make a 500-euros _____, please.
7. When I saw that strange man outside our door I didn't have any other _____
ut to call the police.
8. Having your house painted can be _____. Why don't you paint it yourself?
9. The plane is going to _____ in half an hour. Hurry up!
10. Why are you _____? Is anybody sleeping?
11. The entire village was destroyed when the _____ erupted.
12. I can't _____ that box on the top shelf. Can you get it for me, please?
13. Bryan looks really _____? What's wrong?
14. They can't afford the _____ of spending two weeks by the sea.
15. Don't tell anybody. This is a(n) _____!

Nº	A	B	C	D
1	book	charge	order	request
2	afford	appeal	cross	beam
3	reduction	requirement	freedom	transport
4	economical	natural	national	terminal
5	exposed	supposed	organized	Refreshing
6	bottom	counter	campsite	deposit
7	fare	route	choice	wing
8	repeatedly	frequently	monthly	costly
9	put on	take off	turn on	turn off
10	protecting	whispering	recognizing	Searching
11	lightning	volcano	storm	avalanche
12	panic	blow	reach	destroy
13	loud	main	ancient	upset
14	ground	pain	strength	luxury
15	secret	danger	stress	award

UNIT 18. COOLING OF THE ENGINE

Exercise 18.1. Read the text below.

Chinese authorities are cracking down on Christmas. Several cities, schools, and government institutions have ordered citizens not to celebrate the holiday and to instead focus on promoting traditional Chinese culture.

1 _____

In the northern city of Langfang in Hebei province, city officials ordered all Christmas decorations to be cleared and forbade shops from selling Christmas-themed goods. Officials said the measure was aimed at “maintaining stability” and controlling street hawkers.

2 _____

In Changsha, in central Hunan province, the education bureau last week issued a directive to schools not to celebrate “western festivals” such as Christmas, including putting up decorations, posting related messages or exchanging gifts. At least four Chinese cities and one county have issued a ban on Christmas decorations, according to Associated Press.

3 _____

Chinese citizens are allowed to practice any of the five religions officially recognized by the government, which includes Protestantism and Catholicism. However, religious activities outside of officially sanctioned institutions is banned.

4 _____

Observers say the restrictions are less about an attack on Christianity and more about how local governments are interpreting a directive from the ruling Communist party to promote traditional Chinese culture. The Chinese Communist party is officially atheist and, over the past year, has emphasized the need for party cadres to abandon religious attachments.

5 _____

“Many other countries have already accepted China’s spring festival, which is reported in China as a victory of cultural export. By that logic, there should be no problem with Christmas in China,” Wuyue Sanren, a popular Chinese commentator, wrote online, referring to China’s new year celebration.

6 _____

“It’s an issue of cultural confidence. As long as we are confident about our culture, we won’t be afraid of your ‘western festivals’. If it’s fun, we’ll accept it,” he wrote. For many in China, Christmas has little to do with religion. In Beijing, shopping centers were still decorated with Christmas decorations on Christmas Eve. As in western countries, the holiday is also a shopping event, with discounts on games, makeup and other goods.

Exercise 18.2. Match choices (A–H) to (1–6). There are two choices you don’t need to use. Write your answers on the separate sheet

Which of the following describes _____?

A. Christmas shopping in China

B. the official version of ban

- C. governmental order for educational establishments
- D. misapprehension of bans by local authorities
- E. influence of a Chinese holiday on other cultures
- F. difference of Chinese Christmas from traditional one
- G. a controversial policy of the Chinese government
- H. traditional religious practice in China

GRAMMAR

Дієприкметник (The Participle)

Дієприкметник – неособова форма дієслова, яка має властивості прикметника, прислівника і дієслова. В англійській мові існують два види дієприкметників: **Present Participle (Participle I)** і **Past Participle (Participle II)**. Дієприкметник теперішнього часу, Participle I, відповідає українським дієприслівникам недоконаного виду та активним дієприкметникам теперішнього часу. Participle II (дієприкметник минулого часу) відповідає дієприкметникам минулого часу в українській мові.

Існують такі форми Participle:

Форма дієприкметника	Неперехідні дієслова	Перехідні дієслова	
	Active Voice	Active Voice	Passive Voice
the Present Participle	sleeping	writing	being written
the Past Participle	slept		written
the Perfect Participle	having slept	having written	having been written

PRESENT PARTICIPLE (Participle I). ДІЄПРИКМЕТНИК ТЕПЕРІШНЬОГО ЧАСУ ВЖИВАННЯ ДІЄПРИКМЕТНИКА (PARTICIPLE)

Present Participle (Participle I) відповідає українському дієприкметнику активного стану теперішнього часу та дієприслівнику недоконаного виду.

Listening to the teacher I learn something new. – Слухаючи вчителя, я пізнаю щось нове.

Listening to the teacher I learned something new. – Слухаючи вчителя, я пізнав щось нове.

Listening to the teacher I'll learn something new. – Слухаючи вчителя, я пізнаю щось нове.

Present Participle означає дію, одночасну з дією, вираженою дієсловом-присудком, і може, таким чином, стосуватись теперішнього, минулого або майбутнього часу

Writing a composition in English I consult a Ukrainian-English dictionary. – Під час написання твору англійською мовою я користуюсь українсько-англійським словником.

Writing a composition in English I consulted a Ukrainian-English dictionary. – Під час написання твору англійською мовою я користувався українсько-англійським словником.

Writing a composition in English I'll consult a Ukrainian-English dictionary. – Під час написання твору англійською мовою я скористаюсь українсько-англійським словником.

Present Participle (Participle I) позначає:

1. Дію, що трапилася перед дією, позначеною основним дієсловом.

Arriving to the station, we went to buy tickets for the train. – Прибувши на станцію, ми пішли купувати квитки.

2. Означення в реченні.

I saw a woman sitting in the room. – Я побачив жінку, яка сиділа в кімнаті.

3. Обставину часу, причини, способу дії.

Walking in the park, I saw my friends here. – Я бачив своїх друзів, коли гуляв у парку.

Крім того, дієприкметник Present Participle (Participle I) разом з іменником або займенником, які вживаються перед ним та позначають дію, утворює зворот та перекладається як підрядне або незалежне речення.

We saw him coming. – Ми бачили, як він підходив.

He was seen coming. – Бачили, що він підходив.

There were ten books on the table, two of them being mine. – На столі було десять книжок, дві з них – мої.

PAST PARTICIPLE (Participle II). ДІЄПРИКМЕТНИК МИНУЛОГО ЧАСУ

Past Participle (Participle II) має лише одну форму, перекладається як пасивний дієприкметник та має такі особливості написання.

1. Як правило, дієприкметники, утворені від правильних дієслів, мають закінчення -ed.

look – looked

call – called

2. Якщо основа дієслова має закінчення -e, до неї просто додають d.

hope – hoped

save – saved

3. Якщо дієслово закінчується на приголосний + у, то -у змінюється на -ied.

hurry – hurried

copy – copied

4. Кінцева приголосна подвоюється, коли дієслово закінчується на приголосний, якому передує короткий наголошений голосний.

beg – begged

plan – planned

ВЖИВАННЯ:

як правило, **Past Participle {Participle II}** означає дію, що вже відбулася:

a decorated room – прикрашена кімната;

a written test – написана контрольна робота.

Так само як і **Participle I, Participle II** може позначати дію, одночасну з дією дієслова-присудка, та дію, незалежну від часу. У реченні Past Participle (Participle II) найчастіше буває означенням.

This is a well-known singer. – Це відомий співак.

His father is a respected man. – Його батько – поважна людина.

GRAMMAR ГЕРУНДІЙ. ФОРМИ ГЕРУНДІЯ

Форма герундія	Дійсний стан <i>Active</i>	Пасивний стан <i>Passive</i>
<i>Indefinite</i>	V+ing writing	being V3 being written
<i>Perfect</i>	having V3 having written	having been V3 having been written

I. Gerund Indefinite Active V+ing

1. Для вираження дії, яка відбувається одночасно з дією, вираженою присудком речення в сьогоденні, минулому або майбутньому часі:

1. I enjoy having a lot of friends. 2. He enjoyed talking of the pleasures of travelling. 3. I like inviting friends to my place. 4. They went on talking. 5. She was fond of singing when she was a child.	1. Мені подобається, що у мене багато друзів (мати багато друзів). 2. Він дуже любив говорити про задоволення, яке доставляють йому подорожі 3. Я люблю запрошувати до себе друзів. 4. Вони продовжували розмовляти. 5. Вона любила співати, коли вона була дитиною.
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2. Для вираження дії, яка відбудеться в майбутньому по відношенню до дії, вираженої присудком речення. Тут герундій зазвичай вживається після таких дієслів, як to insist – наполягати, to intend – мати намір, to suggest – припускати та ін:

1. John suggested going to the cinema. 2. He had intended writing him. 3. He insists on our coming back. 4. He keeps insisting on my going home. 5. I don't mind wearing this dress. 6. We think of going there in the summer.	1. Джон запропонував піти в кино. 2. Він збирався написати йому. 3. Він наполягає на тому, щоб ми повернулися. 4. Він продовжує наполягати на тому, щоб я поїхала додому. 5. Я не заперечую проти того, щоб носити цю сукню. 6. Ми думаємо поїхати туди влітку.
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3. Для вираження дії, яка сталася раніше дії, вираженої присудком речення:

1. I remember sending them the invitation. 2. He gave up smoking a few years ago	1. Я пам'ятаю, що послав їм запрошення. 2. Він кинув палити кілька років тому.
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4. Для вираження дії, яка не співвідноситься з будь-яким часом:

1. Eating carrots is good for your eyes. 2. Doing so is not correct.	1. Їсти моркву корисно для очей. 2. Так чинити некоректно.
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II. Gerund Indefinite Passive being V3

виражає дію, що відбувається над особою чи предметом, до якого відноситься герундій:

1. He was afraid of being put into prison. 2. The boy denied being constantly scolded and punished. 3. He was very glad of being helped in his difficulty. 4. She tried to avoid being spoken to. 5. The child insisted on being sent home at once. 6. She showed no sign of being surprised. 7. I was angry at being interrupted every other moment. 8. I like being invited by my friends. 9. I insist on being listened to. 10. She is afraid of being cheated. 11. She doesn't like being looked at. 12. My son likes being taken to the zoo.	1. Він боявся, що його посадять у в'язницю. 2. Хлопчик заперечував, що його постійно сварять і карають. 3. Він був дуже радий, що йому допомагають із труднощами. 4. Вона намагалася уникнути розмов. 5. Дитина наполягала на тому, щоб її негайно відправили додому. 6. Вона не показала жодної ознаки здивування. 7. Я був злий, що мене весь час переривали. 8. Я люблю, коли мене запрошують до себе друзі. 9. Я наполягаю на тому, щоб мене вислухали. 10. Вона боїться, що її обдурять. 11. Вона не любить, коли на неї дивляться. 12. Мій син любить, коли його беруть у зоопарк.
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III. Gerund Perfect Active having V3

виражає дію, що сталася раніше дії, вираженої присудком речення:

1. She denied having been at home that evening. 2. Thank you for having sent me such beautiful flowers. 3. He was accused of having sold important state secrets. 4. He denied having sold them. 5. Excuse me for having broken your beautiful vase. 6. You never mentioned having been to Greece. 7. I don't remember ever having met your sister. 8. I'm sure of having read it once.	1. Вона заперечувала, що була вдома в той вечір. 2. Дякую Вам, що Ви надіслали мені такі красиві квіти. 3. Його звинуватили у тому, що він продав важливі державні секрети. 4. Він заперечив, що продав їх. 5. Вибачте за те, що я розбив вашу красиву вазу. 6. Ви ніколи не згадували, що бували в Греції.
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<p>9. He regretted now having written this letter.</p> <p>10. I don't remember having seen him before.</p> <p>11. He mentioned having read it in the paper.</p> <p>12. I called them to say about my having arrived.</p> <p>13. I remember having studied this lesson.</p> <p>14. I remember my friends having congratulated me then.</p> <p>15. He is proud of having won in the tournament.</p>	<p>7. Я не пам'ятаю, що коли-небудь зустрів вашу сестру.</p> <p>8. Я впевнена (зараз), що вже одного разу читала це (раніше).</p> <p>9. Він жалкував тепер, що написав цей лист. (раніше)</p> <p>10. Я не пам'ятаю, щоб я його бачив раніше.</p> <p>11. Він згадав про те, що читав це в газеті.</p> <p>12. Я подзвонив їм, щоб сказати про те, що я приїхав.</p> <p>13. Я пам'ятаю, що вже вивчав цей урок.</p> <p>14. Я пам'ятаю, що мої друзі привітали мене тоді.</p> <p>15. Він пишається тим, що переміг у турнірі.</p>
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IV. Gerund Perfect Passive having been V3

виражає дію, яка відбувалася над особою чи предметом раніше дії, позначеною присудком речення:

<p>1. Jane Eyre remembered having been locked up in the red room for having contradicted Mrs. Reed.</p> <p>2. I remember having been shown the letter.</p> <p>3. He was proud of having been elected chairman.</p> <p>4. He immediately called the police when he found his flat having been robbed. (that his flat had been robbed)</p> <p>5. She was very proud of having been given that job.</p> <p>6. He complained of having been tortured by the police.</p> <p>7. He was proud of having been invited to the party.</p> <p>8. Without having been seen we entered the house.</p>	<p>1. Джейн Ейр згадала, що була замкнена в червоній кімнаті за те, що суперечила місіс Рід.</p> <p>2. Я пам'ятаю, що мені показували лист.</p> <p>3. Він пишався, що був обраний головою.</p> <p>4. Він негайно зателефонував у поліцію, коли виявив, що його квартира була пограбована.</p> <p>5. Вона дуже пишалася тим, що отримала цю роботу.</p> <p>6. Він подав скаргу на те, що був підданий тортурам з боку поліції.</p> <p>7. Він пишався тим, що його запросили на вечірку.</p> <p>8. Ми увійшли в будинок так, що нас не помітили.</p>
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Герундій в англійській мові виражає назву дії та має ознаки іменника і дієслова. Як і іменник, герундій може бути в реченні:

Підметом:

Travelling is a very adventurous thing. (Подорож – це дуже захоплююче заняття).

Доповненням (прямим і прийменниковим):

I don't mind staying. (Нічого, я залишуся). I am good at playing football. (Я добре граю у футбол).

Обставиною:

He left without saying a word. (Він пішов, не сказавши ні слова).

Іменною частиною присудка:

His task was translating an article. (Його завданням було переклад статті).

А в групі з прийменником of може бути означенням:

I like her way of doing this. (Мені подобається, як вона це робить).

Герундій може бути визначений присвійним і вказівним займенником, або іменником в присвійному або загальному відмінку: his singing – його спів, my friend's speaking – мова мого друга. Перед герундієм може стояти прийменник: before leaving – перед виходом.

Як видно із зазначених прикладів, герундій в англійській мові утворюється шляхом додавання закінчення-ing до інфінітива дієслова без частки to. Якщо необхідно заперечення, ставимо частку not перед герундієм. Герундій в англійській мові має форми часу та застави.

Які ознаки дієслова у герундія в англійській мові? По-перше, після нього може йти пряме доповнення: *Making mistakes is very unpleasant.* – *Робити помилки дуже неприємно.* Герундій може бути визначений прислівником: *I don't like walking slowly.* – *Я не люблю ходити повільно.* У герундія є кілька форм, які представлені нижче:

Способи перекладу герундія в англійській мові

Герундій в англійській мові можна перекладати: іменником, який передає процес: reading – читання, walking – прогулянка, painting – малювання; дієсловом, зазвичай інфінітивом або іноді дієсловом: *Much depends on his leaving the hotel.* – Багато чого залежить від того, чи залишить він готель; *without saying a word* – не сказавши ні слова.

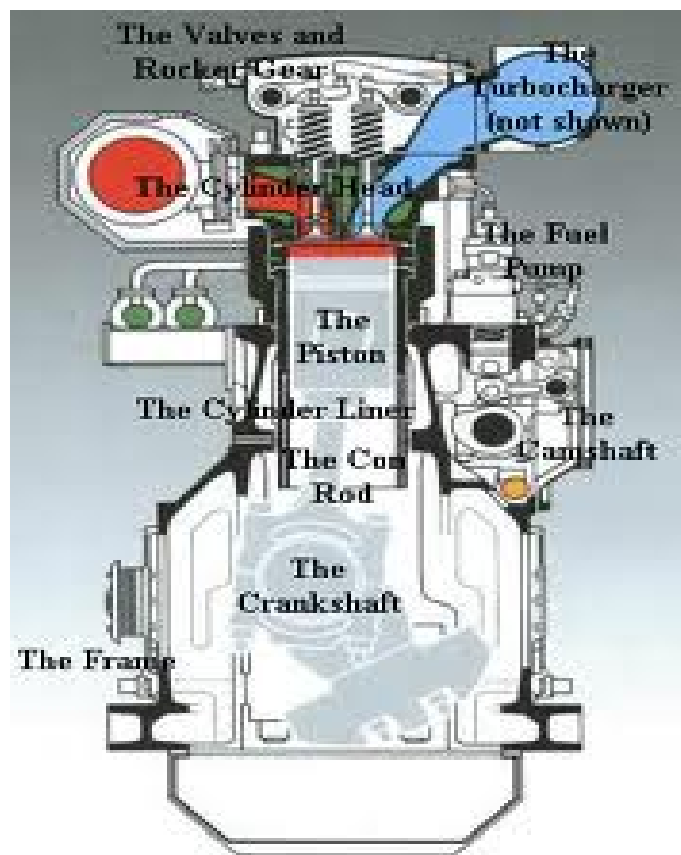
Складні форми герундія майже завжди перекладають підрядними реченнями.

Тема герундія в англійській мові складна тим, що деякі дієслова вживаються тільки з ним, а деякі з іншими неособовими формами дієслова. Більше того, є дієслова і деякі вирази, які допускають, наприклад, вживання і герундія, і інфінітива. Ці групи дієслів (і певних висловів) потрібно знати напам'ять, щоб не робити граматичних помилок при побудові речень.

READING

Read and translate the text

TEXT A: «COOLING OF THE ENGINE»



The burning fuel within the cylinders produces intense heat, most of which is expelled through the exhaust. Much of the remaining heat, however, must be removed to prevent the engine from overheating. Most aircraft engines are air-cooled. They are built with fins projecting from the cylinder walls so that the heat will be carried away by air flowing past the fins.

Use of Mixture Control. The fuel-air mixture in most engines can be changed by adjusting the mixture controls in the cockpit. The mixture control will normally have a red knob (an indication to use caution). This control enables the pilot to adjust the ratio of the fuel-to-air mixture that goes into the cylinders. This ratio of fuel to air is the most important single factor affecting the power output of an engine.

Fuel Contamination. Water and dirt contamination of fuel system is potentially dangerous; the pilot must delete contamination or eliminate contamination that has occurred.

How an Engine Operates. Most aircraft engines operate upon the same principles as motor car engines. The mechanism consists of a cylinder, piston, a connecting rod, and a crankshaft. One end of the connecting rod is attached to the piston. At the closed end of the cylinder there are normally two spark plugs to ignite the fuel, and two openings, controlled by valves, one to admit the mixture of fuel and air, and the other to permit the burned gases to escape. Operation of the engine requires four strokes of the piston:

- 1) The piston moves away from the cylinder ahead. The intake valve is opened and the fuel-air mixture is sucked into the cylinder.
 - 2) The piston returns to the top of the cylinder. Both valves are closed, and the fuel-air mixture compressed.
 - 3) When the piston is approximately at the top of the cylinder head, a spark from the plugs ignites the mixture, which burns at a controlled rate. Expansion of the burnings gas exerts pressure on the piston, forcing it downward on the power stroke.
- Just before the piston completes the power stroke, the exhaust valve starts to open and the burned gases are forced out as the piston returns to the top of the cylinder

WORD LIST

1. *intense heat* – *сильне нагрівання*
2. *remaining* – *той, що залишився*
3. *crankshaft* – *колінчатий вал*
4. *connecting rod* – *шатун*
5. *spark plug* – *свіча запалювання*
6. *to escape* – *вириватися*
7. *mixture control* – *регулятор складу паливної суміші*
8. *stroke* – *хід, такт*
9. *to suck* – *всмоктувати*
10. *spark* – *іскра*
11. *expansion* – *розширення*
12. *to exert* – *викликати (тиск)*
13. *exhaust valve* – *випускний клапан*
14. *smoothness* – *плавність*
15. *to gain* – *отримувати*
16. *to expel* – *викидати*
17. *to project* – *виступати*
18. *to adjust* – *регулювати*
19. *ratio* – *співвідношення*
20. *contamination* – *забруднення*
21. *to occur* – *відбуватися*
22. *to supply* – *подавати*
23. *to ignite* – *запалювати*
24. *caution* – *обережність, попередження*

Exercise 18.3. Answer the questions:

1. Which element must be removed to prevent the engine from overheating?
2. Has the mixture control a red knob?
3. Which controls enables the pilot to adjust the ratio of the fuel-to-air mixture?
4. How many spark plugs has a cylinder?

Exercise 18. 4. Give English equivalents.

Випускний клапан, свіча запалювання, розраховувати, шатун, співвідношення, такий самий принцип, як фактор, що впливає на потужність, обидва клапани

закриті, регулятор складу паливної суміші, запалювати паливо, розширення, відбуватися, контролюється клапанами.

Exercise 18. 5. Read and translate the dialogue.

TEXT B: «HEAT PROCESSES IN AIRCRAFT ENGINES»

(Dialogue)

Pupils V, P, N and their practice instructor (PI) are visiting a big aircraft engine manufacturing plant. Presently they are in a programmed instruction room of the plant discussion heat processes in aircraft engines.

P1: Glad to see you all. Have you ever been to an engine manufacturing plant before?

N: I'm afraid not. But we we've seen a movie about aircraft engine manufacturing.

P: I'm a former car technician and know something about piston engines.

P1: It will be of some help. The principles of piston and jet engine operation have a lot in common. Can anyone mention the strokes which comprise a four- stroke cycle?

P: I can. A piston engine works on a four-stroke cycle, beginning with induction.

The next stroke is compression, and then follows combustion of air- fuel mixture. The final stroke is exhaust.

P1: Quit so. A jet engine accelerates great number masses of air and actually has the same four stages, but arranged differently.

N: What is this jet engine? We have not seen any yet.

P1: The simplest of all jets is a ramjet. It is a tapered tube, open at both ends, into which fuel is injected. Air flows into this tube from the left, but the tube widens and the airflow slows down, and

P: And is this the induction stage?

P1: It is. Then air slows down because the tube widens and the lost speed energy re-appears as an increase in pressure and as heat.

P1: It does. Energy can't be lost; it can only change its form. Pressure and heat are just other forms of the lost speed energy of the air, entering the air intake of the ramj

V: And this corresponds to the compression stroke in the reciprocating engine, doesn't it? et.

P: Now to start things really moving we have to inject fuel into this tube and ignite the mixture, haven't we?

P1: Very definitely we have. All these processes are going on inside the combustion chamber, causing a big rise in temperature and....

N: And even bigger rise in pressure!

P1: Not at all. There is actually very little rise in pressure because the air is free to escape through the rear of the tube.

N: So can one say that both combustion and exhaust stages take place at the same time?

P1: One can say just that. All four stages are going on here at the same time, but at different parts of the engine.

P: But in a piston engine all of them occur in one place, the cylinder, but at different times.

P1: You are quite right. I can only add that the efficiency of the compression stage in ramjets is quite low.

V: Isn't possible to put some sort of compressor near the intake?

P1: It is. But we must also think about some means of rotating this compressor ...

P: Isn't possible to put some sort of turbine into the flow of exhaust gases.

WORD LIST

1. *engine manufacturing plant* – завод з випуску авіаційних двигунів
2. *former* – минулий, попередній
3. *piston engine* – поршневий двигун
4. *to have a lot in common* – мати багато спільного
5. *stroke* – хід, такт
6. *to compose* – складати
7. *four stroke cycle* – чотирикратний цикл
8. *to accelerate* – прискорювати, розганяти
9. *ramjet* – газотурбінний реактивний двигун
10. *to arrange* – встановлювати
11. *induction* – індукція, індуктивний спосіб
12. *to widen* – розширювати
13. *to slow down* – уповільнювати
14. *reciprocating engine* – поршневий двигун
15. *to reappear* – показуватися
16. *to escape* – залишати, випаровуватися
17. *to correspond* – відповідати, бути аналогічним
18. *to inject* – вприскувати
19. *to ignite* – запалювати
20. *to add* – додавати
21. *to occur* – траплятися
22. *sound* – логічний, правильний
23. *proposition* – пропозиція

Exercise 18.6. Open the brackets and use the correct form of Participle I.

1. That morning (go) up to his study he thought of his unpleasant day.
2. She smiled (remember) the joke.
3. A new road will soon be built (connect) the plant with the railway station.
4. He speaks like a man (take) his opinion of everything.
5. (Not know) that she could trust them she did not know what to do.
6. And (say) this he sat in the armchair.
7. I spent about ten minutes (turn) over the sixteen pages of The Guardian before I found the main news and articles.
8. (Be) so far away he still feels himself part of the community.
9. The boy came out of the water (shake) from top to toe.
10. (Support) her by the arm he helped her out of the taxi.

Exercise 18.7. Paraphrase the following using Participle I where it is possible.

Example: The man who is speaking to Mary is a well-known surgeon. — The man speaking to Mary is a well-known surgeon.

1. The woman who is working in the garden is my sister.
2. The man who made a report yesterday came back from the USA.
3. I couldn't ring them up because I did not know their telephone number.
4. We went to see our friends who had just returned from a voyage.
5. The sidewalks were crowded with people who were watching the carnival.
6. He had a massive gold watch, which had belonged to his father.
7. He stood at the counter and hesitated, he did not know what to choose.
8. The conferences, which are held at the University every year, are devoted to ecological problems.
9. Unable to attend the conference that took place a month ago, we asked to send the typewritten reports.
10. I looked at the people who were lying on the beach.

Exercise 18. 8. Open the brackets and use the correct form of Participle II.

1. She looked at the table. There was a loaf of brown bread (divide) into two halves.
2. There was another pause (break) by a fit of laughing of one of the old men sitting in the first row.
3. The child (leave) alone in the large room began screaming.
4. The centre of the cotton industry is Manchester (connect) with Liverpool by a canal.
5. The story (tell) by the old captain made the young girl cry.

Exercise 18. 9. Open the brackets and use the correct form of Participle I Perfect.

1. (See) so little of the country, I am afraid I cannot answer all your questions.
2. (Arrive) two days before the conference he had a lot of time to see Edinburgh.
3. I felt very tired (work) the whole day in the sun.
4. (Buy) a pair of gloves we moved to the shoe department.
5. She left (tell) us all she had found out. 6. (Get) what he wanted he took his hat and left.

Exercise 18.10. Choose the right variant.

1. She stayed ___ in her room, ___ to come downstairs.
 - a) having locked, refused
 - b) locked, refusing
 - c) locking, having refused
2. She had a good practical knowledge of French ___ as an interpreter for many years in France.
 - a) working
 - b) having worked
 - c) worked
3. When we ___ from our day's outing came into the kitchen, we found dinner _____.
 - a) returned, serving
 - b) having returned, served
 - c) returning, having served
4. ___ by his elbow, Mary listened to their talk.
 - a) supported
 - b) supporting
 - c) having supported

5. ___ their meal they went for a stroll in the park.
 - a) finishing b) finished
 - c) having finished
6. Fruits ___ in hothouses are not so rich in colour, taste and vitamins as fruits ___ in natural conditions.
 - a) having grown, grown
 - b) grown, growing
 - c) growing, having grown
7. ___ in the reception room he thought over what he would say when he was asked into the office.
 - a) waiting
 - b) waited
 - c) having waited
8. She used to say sharp and ___ words to him.
 - a) having wounded
 - b) wounded
 - c) wounding
9. I admired the grounds and trees ___ the house.
 - a) surrounding
 - b) having surrounded e) surrounded
10. She looked at the scene ___ to the innermost of her heart.
 - a) shaking
 - b) shaken
 - c) having shaken

Exercise 18.11. Complete the following sentences using Gerunds.

1. (Be) free and alone is a good thing if you are tired of big cities.
2. (Find) you here was a quite a surprise.
3. If this is what you intend (ask) me, stop (waste) your time.
4. They kept on (talk) though the band began (play).
5. Everyone enjoyed (swim) in the river.
6. My watch needs (repair).
7. He never mentioned (live) in Prague.
8. He does not seem to mind (air) the room.
9. Just imagine (go) there together!
10. Don't put of (do) it now. If you postpone (receive) a visa again, you will miss an excellent opportunity of (go) there.

Exercise 18.12. Fill in the blanks with prepositions after, before, by, on, without.

1. What did she mean ___ boasting like this?
2. His knowledge has improved ___ taking a training course.
3. He could tell the funniest story ___ smiling.
4. ___ entering the house she rushed to the telephone ___ greeting anybody.
5. You can keep healthy and fit ___ jogging in the morning.
6. Where did he go ___ finishing his work?

7. ___ writing an article about the events he must go to the place where they are taking place. 8. ___ hearing a woman's cry he jumped up from his seat.
9. ___ going through the customs office he went aboard the plane.
10. She was upset ___ not getting an answer from him.

Exercise 18.13. Choose the suitable form.

1. I don't mind _____ Zac. It's a nice nickname.
a) calling
b) being called
c) having been called

- The safe showed no sign of _____.
a) touching
b) being touched
c) having been touched

- Our teacher suggests _____ test next week.
a) writing
b) being written
c) having been written

- I really appreciate _____ this opportunity. I'll do my best.
a) giving
b) being given
c) having been given

- She strongly objected to our _____ a fire.
a) making
b) being made
c) having been made

- The child was punished by _____ to bed without dinner.
a) sending
b) being sent
c) having been sent

- He was clever enough _____ _____ in this delicate situation.
a) avoiding, speaking
b) to avoid, to speak
c) avoiding, to speak
to avoid, speaking

- I wonder if there is any use _____ _____ the results.
a) trying, improving
b) trying, to improve

c) to try, to improve
to try, improving

I used a car to get to work, and now I can't get used to _____ by bus.

- a) go
- b) going

Do you remember _____ your last exam? Was it hard?

- a) take
- b) to take
- c) taking

I don't feel like _____ this article today.

- a) reading and to translate
- b) to read and translating
- c) reading and translating

The little girl was really afraid of _____ lost in the forest.

- a) having been
- b) getting
- c) having got

Is there anything here worth _____?

- a) buying
- b) being bought
- c) having been bought

He disliked _____ coming home late.

- a) I
- b) Me

Would you mind _____ smoking here?

- a) not
- b) not to
- c) no
- d) don't

We stopped _____ some food in the store, because we'd run out of our supplies.

- a) buying
- b) to buy
- c) having bought

What about _____ to the cinema tomorrow?

- a) to go
- b) going
- c) having gone

_____ you here was a great surprise to me.

- a) finding
- b) having found

The friends couldn't _____ laughing when they discovered the problem.

- a) assist
- b) help
- c) aid
- d) support

I can't _____ standing in queues.

- a) stand
- b) fall
- c) sit
- d) lie

TEST UNIT 18

1. One word in each sentence is in an incorrect form. Delete it and write the word in its correct form in the space.

For example: A powerful ~~compressive~~ pumps the fluid around the pipes. compressor

1. When a gas condensation, it gives out heat and changes into a liquid. _____
2. Inside the evaporates, the fluid changes into a gas. _____
3. This food has to be kept cold, so please put it into the refrigerant. _____
4. When a rubber band is pulled, the length expansions and the width contracts. _____
5. The fan in the room is powerful enough to extractor all the petrol fumes. _____
6. The robot drives the forklift truck just like a human operate. _____
7. We apologise for this mistake, and we are pleased to offer you a reduce in the price. _____
8. The pistons moved up and down in a rapid reciprocates motion. _____

2. Replace the underlined phrase with a verb from the box that has the same or similar meaning. Write the verb in its correct form.

decompress / emit / absorb / solidify / extract / liquefy

1. The pieces of glass were pulled out from the injured man's arm. _____
2. A loud beeping sound was given out every two seconds from the locating device. _____
3. Heat is taken in from the surrounding air into the fluid when it evaporates. _____
4. When the liquid was cooled to below freezing point, it quickly became hard. _____
5. When the valve was opened, the air in the tyre immediately lost its pressure. _____

6. When the ice cube was heated, it melted and quickly turned into a fluid.

3. Look at these sentences about the internal combustion engine. Underline one word in each sentence and write a word from the box with the same or similar meaning. You don't need all the words.

stroke / shaft / port / exhaust / chamber

1. The piston moves up and down inside a sealed cylinder. _____
2. When the fuel ignites, it causes a downward movement of the piston. _____
3. Air mixes with petrol and flows in through a special opening. _____
4. Power is transmitted from the pistons to the wheels by means of a rotating rod.

4. Choose the correct answers. Write a letter (a – d) in each space.

1. If you want to become an engineer, you could try _____ a degree course at this college.
a) follow b) for follow c) you follow d) following
2. There was an accident on the motorway this morning. This might _____ causing the traffic jam.
a) be b) is c) for d) has
3. My car doesn't start, but the battery is OK. I think the petrol tank _____ empty.”
a) must have b) must c) must be d) must to be
4. How many boxes _____ in the warehouse last week?
a) have damaged the fire b) were damaged by the fire
c) the fire damaged d) the fire has damaged
5. The tree has burnt to the ground. The lightning must have _____ it in the storm last night.
a) to strike b) struck c) be striking d) strike
6. All the main repairs to the building _____ completed more than three months ago.
a) did b) have c) are d) were
7. The car engine drives the fan belt, _____ makes the fan blow cold air on the radiator.
a) which b) when c) what d) where
8. If your computer has broken down, why _____ send it for repair to our IT specialists?
a) you don't b) aren't you c) don't you d) not you
9. The first module of the International Space Station _____ into space in 1998.
a) they sent b) was sent c) did send d) which sent
10. When the heat is too high, _____ makes the steel beams in the building expand and bend.
a) and it b) which c) it d) and
11. The burnt gases escape from the cylinder _____ the exhaust port opens.
a) why b) which c) what d) when
12. The piston becomes hotter _____ it moves up and down inside the cylinder.
a) than b) as c) that d) which

5. Rewrite these sentences to give the same or similar meaning.

1. Our contractor took the photos and wrote the report.
The report _____ and the photos _____ our contractor.
2. Here's a suggestion. You could close your program and reboot your computer.
Here's a suggestion. Why _____ try _____?
3. The water that flows down from the dam drives the turbine.
The turbine _____ the water which _____.
4. I'm sure that yesterday's e-mail brought a virus into my computer.
Yesterday's e-mail must _____.

6. These phrases are missing from description of the new type of engine. Decide where they fit. Write a letter (A – J) in each space.

- A ordinary water is pumped into the cylinder
- B which forces the piston down
- C which uses this heat
- D is very hot
- E pushes the steam out of the cylinder
- F you can touch the engine block
- G intake valve
- H into steam
- I cools the engine from inside
- J on the normal four-stroke engine

THE SIX-STROKE INTERNAL COMBUSTION ENGINE – A NEW INVENTION

Four-stroke internal-combustion engines waste a lot of heat. Here is my idea for a new invention (1)_____ and converts it into more energy. My new invention is the *six-stroke* engine. It's based (2)_____, but it has two extra strokes and one extra (3)_____. What do you think comes into the engine through this valve? It's water!

After the exhaust gases flow out of the engine cylinder, (4)_____ through the extra valve. Inside the cylinder, which (5)_____, the water immediately changes (6)_____. The steam expands to 1,600 times its volume, (7)_____ for a *second power stroke*.

Then a *second exhaust stroke* (8)_____, and then the six-stroke cycle begins again.

This six-stroke water-injection cycle provides extra power, but it also (9)_____. When the engine is running, (10)_____ with your hand. It's not hot, but only warm!

UNIT 19. PARKING, SECURING AND MOORING THE HELICOPTER

Exercise 19.1. Choose the word or phrase that produces a grammatically correct sentence. Choose the best option: A, B, C, or D, to fill the gaps.

1. My parents' _____ Rome in two months.
2. When I _____ Matthew at the party yesterday, he didn't speak to me.
3. Julie _____ put her coat on because it was very cold outside.
4. Tonight Laura _____ TV as always.
5. Liz _____ to Finland next year.
6. Jake _____ after we had left from the restaurant.
7. Chris reminded me _____ to send the e-mails that day.
8. In _____ of the fact that he was wearing a seat belt, Henry was injured in the accident.
9. All the documents must _____ by tonight.
10. This exercise is too difficult for me _____.
11. I may _____ my wallet at home.
12. I wish I _____ on the beach since it's too hot today.
13. Sam wishes he _____ that job abroad last year.
14. What _____ for Jake's birthday?
15. By this time next year I _____ English for nineteen years.

No	A	B	C	D
1	visited	visit	are visiting	used to visit
2	saw	am seeing	was seeing	didn't see
3	had to	must	might	can't
4	will have watched	will be watching	watches	she will watch
5	is going to move	will have been moving	moves	going to move
6	called	was calling	had been calling	had called
7	to not forget	not forget	not to forget	to have forgotten
8	spite	order	though	due
9	send	have sent	to send	be sent
10	doing	to do	do	have done
11	to have left	left	leaving	have left
12	am	had been	were	would be
13	would accept	had accepted	accepted	accepts
14	you bought	you are buying	didn't you buy	did you buy
15	will teach	am going to teach	will have been teaching	am teaching

Exercise 19.2. Choose the best option: A, B, C, or D, to fill the gaps in the text.

A small side door 1 _____ into the white-washed corridor from which the three bedrooms opened. We 2 _____ at once to the one in which Miss Stoner was now sleeping,

and in which her sister ' 3 _____ with her fate. It was a cozy little room, with a low ' 4 _____ and a gaping fireplace, the style of old country houses. A brown chest of drawers stood in one corner, a narrow bed in 5 _____, and a dressing table on the left-hand side of the window.

№	A	B	C	D
1	carried	led	guided	took
2	arrived	entered	reached	passed
3	Was met	Had met	Was meeting	Will meet
4	floor	ceiling	window	Walls
5	other	another	second	The second

GRAMMAR

МОДАЛЬНІ ДІЄСЛОВА, ЇХ ЕКВІВАЛЕНТИ

У чому різниця між модальними дієсловами та їх еквівалентами в англійській мові?

Зрозуміло, ця різниця досить велика. Водночас її важко відразу вловити. У таблиці нижче наведені найбільш важливі, значущі відмінності.

Модальні дієслова	Еквіваленти модальних дієслів
Після них не вживається прийменник	Після них може, а іноді навіть повинен бути вжитий прийменник
З ними ніколи не використовуються допоміжні дієслова	Допоміжні дієслова використовуються з більшістю з них так само, як і зі звичайними дієсловами
Вони не вживаються у часах категорії «досконалі», «тривалі» і «вчинені тривалі»	Вони вживаються у всіх часах і видо-часових формах
У них відсутня форма із закінченням -ing.	Вони можуть приймати форму герундія та дієприкметника теперішнього і/або минулого часу

Еквівалент дієслова to have to get

to get у формі минулого часу легко може замінити to have у формі теперішнього.

Варіант з to have	Варіант з to get	Переклад
I have a new car.	I got a new car.	У мене нова машина.
My sister has a new job.	My sister has got a new job.	У моєї сестри нова робота./Моя сестра отримала нову роботу.
I have never had any girlfriend.	I have never got any girlfriend.	У мене ніколи не було дівчини.

Еквіваленти модальних дієслів в англійській мові дуже корисні, коли потрібно сформулювати питання або заперечення, тому що вони підпорядковуються стандартним правилам: додається відповідне допоміжне дієслово, змінюється порядок слів або додається відповідна частка *not*.

Еквівалент дієслова can – to be able to

Модальні дієслова та їх еквіваленти можуть сильно відрізнятися. Так, знайоме багатьом дієслово *can* дуже відрізняється від конструкції *to be able to*. Дієслово обходиться без прийменника, а конструкція його потребує; дієслово дуже лаконічне, а конструкція здається переобтяженою; дієслово звучить просто, а конструкція – формально. Проте вони цілком взаємозамінні.

Варіант з <i>can</i>	Варіант з <i>to be able to</i>	Переклад
He can run very fast without getting tired.	He is able to run very fast without getting tired.	Він може (здатний) бігти дуже швидко і не втомлюватися.
Can we use this tool to fix the machine?	Are we able to use this tool to fix the machine?	Ми можемо (здатні) використувати цей інструмент, щоб полагодити машину?
They can not live together.	They are not able to live together.	Вони не можуть (не здатні) жити разом.

Як свідчать приклади, *to be able to* майже ідентичний *to can* за своїм лексичним значенням.

Еквівалент дієслова to must – to have to

Усі модальні дієслова та їх еквіваленти чимось схожі. *To have to* за своєю структурою нагадує трохи *to be able to*, з тією лише різницею, що друге звучить більш формально, а перше – більш м'яко і лояльно. *Has to* зазвичай перекладають як «доводиться». Проте у багатьох випадках воно цілком вдало замінює *must*.

Варіант з <i>to must</i>	Варіант з <i>to have to</i>	Переклад
I must not go to work now.	I have not to go to work now.	Я не повинен йти зараз на роботу./Мені не доведеться йти зараз на роботу.
Her father says that my friend must marry her.	Her father says that my friend has to marry her.	Її батько каже, що мій друг повинен/моєму другові доведеться з нею одружитися.
Must we help him?	We Have to help him?	Ми повинні/нам доведеться допомогти йому?

Як показують приклади речень, з еквівалентом модального дієслова *to must*, *to have to* практично повністю здатні його замінити.

Еквівалент дієслова to may – to be allowed to

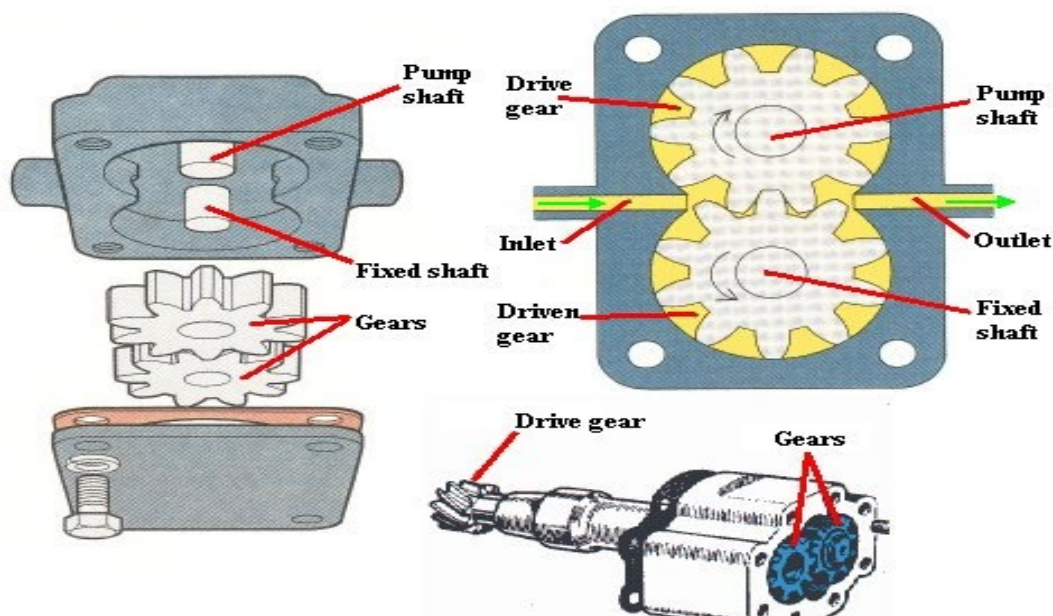
У даному випадку доведеться звернути увагу на багатозначність дієслова to may. Воно може позначати як розумову здатність (наприклад, «я можу швидко рахувати в думці»), так і дозвіл на що-небудь. Саме друге значення замінюється фразою to be able to.

Варіант з to may	Варіант з to be allowed to	Переклад
If I may say so, sir.	If I am allowed to say so, sir.	Якщо я можу/Якщо можна так висловитися, сер.
My mother always says I may visit her at any time.	My mother always says I am allowed to visit her at any time.	Моя мама завжди каже, що я можу наносити їй візити в будь-який час.
May I ask you a question?	Am I allowed to ask you a question?	Можна мені поставити вам запитання?

READING

Read and translate the text.

TEXT A: «THE LUBRICATION SYSTEM»



A pressure feeding lubrication system has been adopted to supply oil to the moving parts of the engine. The lubrication system consists of an oil pan, oil pump, oil filter and other external parts which supply oil to the moving parts in the engine block. Oil from the oil pan is pumped up by the oil pump. After it passes through the oil filter, it is fed through the various oil holes in the crankshaft and cylinder block. After passing through the cylinder block and performing its lubrication function, the oil is returned by gravity to the oil pan. A dipstick on the side of the cylinder block is provided to check oil level.

The oil pump pumps up oil from the oil pan and sends it under pressure to the various parts of the engine.

The oil filter is a built-in paper filter element. Particles of metal, airborne dust carbon, and other impurities can get in the oil during use. The oil filter, integrated into the oil line, removes these impurities as the oil passes through it. The filter is mounted outside the engine to simplify replacement of the filter element. A relief valve is also included ahead of the filter element to relieve the high oil pressure in case the filter element becomes clogged with impurities.

WORD LIST

1. *lubrication system* – система змащення
2. *pressure feeding* – подача під тиском
3. *to adopt* – приймати
4. *supply* – подача
5. *oil pan* – масляний піддон
6. *oil pump* – масляний насос
7. *oil filter* – масляний фільтр
8. *external* – зовнішній
9. *engine block* – блок циліндрів двигуна
10. *to pump up* – накачувати, нагнімати
11. *to feed (fed, fed)* – забезпечувати
12. *various* – різноманітний
13. *oil hole* – отвір для заливання мастила
14. *crankshaft* – колінчастий вал
15. *cylinder block* – блок циліндрів
16. *by gravity* – самотливом
17. *dipstick* – мірна лінійка
18. *oil strainer* – масло очисник
19. *to mount* – закріплювати, встановлювати
20. *inlet* – вхідний пристрій
21. *gear pump* – зубчатий насос
22. *drive gear* – ведучий привод
23. *driven gear* – ведений механізм
24. *pump body* – циліндр насоса
25. *to rotate* – обертати
26. *opposite direction* – протилежний напрямок
27. *gear teeth* – зубчасте колесо
28. *to disengage* – роз'єднувати
29. *to exceed* – перевищувати
30. *capacity* – ємкість
31. *utilization* – утилізація, використання у виробництві
32. *to oversupply* – забезпечувати з лишком
33. *coil spring* – спіральна пружина
34. *bypass* – перепуск
35. *to overpower* – пересилювати

36. *airborn duct carbon* – продукти згорання з повітропроводу
37. *accelerated wear* – прискорений знос
38. *impurity* – засміченість, домішка
39. *to integrate* – об'єднувати
40. *to simplify* – спростити
41. *replacement* – заміна
42. *relief valve* – компенсаційний клапан

Exercise 19.3. Answer the questions:

1. What is lubrication system used for?
2. What elements are the part of the lubrication system?
3. What is the oil filter?
4. What is the oil pump?

Exercise 19. 4. Translate into English.

1. Механіки виявили несправність масляного насосу, його необхідно замінити.
2. Масло проходить через компенсаційний клапан, що знаходиться на зовнішній частині двигуна.
3. Масляний насос качає масло через масляний піддон і пропускає його під тиском до різних частин двигуна.
4. Частини металу, бруд, а також продукти згорання можуть потрапляти до масла і спричинити прискорений знос деталей.
5. Під час нормальної маслоподачі спіральна пружина і клапан перепуску повинні бути в закритому стані.

READING

Read and translate the text.

TEXT B: «PARKING, SECURING and MOORING the HELICOPTER».

To park helicopter for short intervals, perform following steps:

To prevent rotor damage from blade flapping as a result of air turbulence from other aircraft landing, taking off or taxiing, or sudden wind gusts, rotor blades should be secured whenever helicopter is parked.

Locate helicopter slightly more than blade clearance from nearby objects on most level ground available. Apply friction to lock cyclic and collective sticks so that friction control knobs are positioned as follows: neutral for cyclic stick and full down for collective stick. If not already accomplished, apply paint mark on edge of guide to locate neutral position for future reference.

Install blade socks on all blades.

Install engine exhaust cover on exhaust tailpipe.

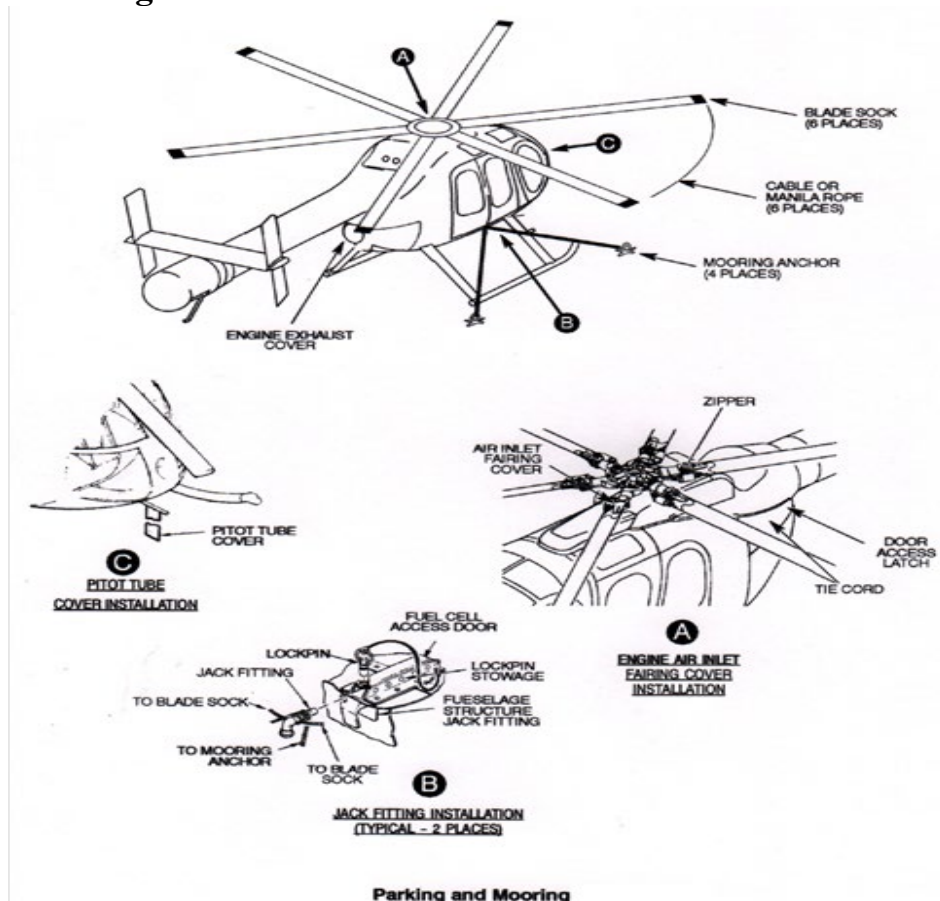
Securing Helicopters

Structural damage can occur from high velocity surface winds. Therefore, if at all possible, helicopters should be evacuated to a safe weather area if tornado, hurricane, or strong winds are expected. If helicopters can be hangered, do so. If not, they should be tied down. Helicopters that are tied down properly can usually endure winds up to approximately 65-75 mph. Winds which excess of 75 mph will probably

cause damage to helicopters. When high winds are anticipated, and helicopters are to be tied down, they should be secured as follows:

- a) Place the helicopter in the direction from which the highest forecasted wind or gusts are anticipated.
- b) Deflect the helicopter slightly more than rotor distance from other aircraft.
- c) Set and lock wheel brakes. Place wheel chocks fore and aft of all wheels (if available). Secure the chocks by nailing wood cleats from chock to chock on each side of each wheel.
- d) Position the main rotor blades and tie them down in accordance with the manufacturer's instructions.
- e) Install a rotor blade cover on the tip of each main rotor blade. Secure a tie down rope to each blade cover. Remember not to leave too much slack and to use anti-slip.
- g) Place the tail rotor in a vertical position and install a cover over the lower blade tip. Tie the lower blade cover rope to the tail skid to prevent possible damage by flapping tail blades.
- h) Close doors, windows, and access panels.
- i) Follow the manufacturer's instructions for each model helicopter.

Helicopter Mooring



Before mooring the aircraft it will be necessary to attach a mooring clevis. Mooring rings are to be installed on the aircraft.

It is highly recommended that helicopters are flown with the mooring hard-ware installed at all times to permit a rapid response to weather emergencies, unless it is the commanders' decision to fly without it if it would significantly impact the mission.

Before mooring the aircraft will be necessary to install a mooring clevis at each of the four jacking points. A mechanics tool kit will be required.

WORD LIST

- 1. park – місце стоянки (ЛА)***
- 2. following step – наступний крок***
- 3. to prevent – запобігати***
- 4. damage – пошкодження***
- 5. blade flapping – удар лопаті***
- 6. turbulence – турбулентність***
- 7. aircraft landing – приземлення повітряного судна***
- 8. taking off – зліт***
- 9. taxiing – руління***
- 10. wind gust – порив вітру***
- 11. whenever – кожного разу***
- 12. to locate – установлювати, визначати місцезнаходження***
- 13. slightly – злегка***
- 14. clearance – зазор, кліренс***
- 15. nearby – найближчий***
- 16. available – доступний***
- 17. to apply – застосовувати, використовувати***
- 18. friction – тертя***
- 19. lock – замок, фіксація***
- 20. cyclic – ручка управління***
- 21. collective stick – важіль «ШАГ- ГАЗ»***
- 22. control knob – ручка регулювання***
- 23. position – місце розташування***
- 24. neutral – нейтральний***
- 25. full down – повністю випущене положення***
- 26. to accomplish – виконувати, завершувати***
- 27. paint mark – нанесено фарбою***
- 28. edge – кромка***
- 29. guide – направляючий***
- 30. reference – орієнтир***
- 31. main rotor – несучий гвинт***
- 32. blade – лопать***
- 33. bend – нахил***
- 34. load – навантаження***
- 35. tail boom – хвостова балка***
- 36. to install – встановлювати***
- 37. blade sock – чохол для лопаті***
- 38. tie down – швартовка***
- 39. jack – підйомник***
- 40. fitting – вузол кріплення***
- 41. exhaust tailpipe – вихлопна труба***

- 42. *exhaust cover* – вихлопна кришка
- 43. *structural* – структурний
- 44. *to occur* – виникати
- 45. *velocity* – швидкість
- 46. *to evacuate* – покидати, вивозити
- 47. *tornado* – торнадо
- 48. *hurricane* – ураган
- 49. *hangar* – ангар
- 50. *properly* – правильно
- 51. *to endure* – витримати
- 52. *mph* – миля за годину
- 53. *to anticipate* – передбачати
- 54. *forecast* – прогноз
- 55. *gust* – порив вітру
- 56. *to deflect* – переміщати, відхилювати
- 57. *span* – ширина, діаметр
- 58. *wheel chock* – колодка під колесо
- 59. *wheel brake* – колісне гальмо
- 60. *fore* – носова частина
- 61. *aft* – назад, задня частина
- 62. *nailing* – закріплення
- 63. *to cleat* – кріпити за допомогою планки
- 64. *rope* – трос
- 65. *substitute* – заміна
- 66. *accordance* – згідно
- 67. *manufacturer instruction* – інструкція виробника
- 68. *to cover* – накривати
- 69. *tip* – закінцівка крила
- 70. *slack* – слабе місце натягнення
- 71. *anti-slip knot* – вузол, що перешкоджає ковзанню
- 72. *tail skid* – хвостова п'ята
- 73. *flapping* – коливання, маховий рух
- 74. *access* – лючок
- 75. *to attach* – прикріплювати
- 76. *mooring clevis* – швартовий пружинний крюк
- 77. *hook* – крюк
- 78. *to sustain* – підпирати, прикріплювати
- 79. *mooring chain* – швартовий ланцюг
- 80. *mooring ring* – швартове кільце
- 81. *fairing covering* – чохол обтічника
- 82. *jack-point* – гніздо для установки домкрата
- 83. *flush head* – потайна голівка
- 84. *to remove* – знімати
- 85. *pad* – колодка
- 86. *hard-ware* – апаратура

- 87. *permit* – дозвіл
- 88. *rapid response* – швидка реакція
- 89. *weather emergency* – критичні погодні умови
- 90. *significantly* – значно
- 91. *impact* – вплив, зіткнення, удар
- 92. *mission* – виліт, місія
- 93. *tool kit* – комплект інструментів

Exercise 19.5. Answer the questions:

1. Which steps have you to follow during prevention the main rotor blades from damage?
2. When can happen the structural damage of the helicopter?
3. Which is permissible wind for securing the helicopter?
4. How is helicopter tied down in a way of a strong wing?
5. What is it important to follow during mooring the helicopter?

Exercise 19.6. Translate into English.

1. Ви повинні запобігати пошкодженню гвинта, яке може трапитися від удару лопаті, як наслідок турбулентності.
2. Пам'ятайте, що не потрібно залишати трос слабонатягнутий під час процедури швартування вертольота.
3. Структурні пошкодження можуть трапитися від високої швидкості вітру.
4. Перед швартуванням вертоліта його обов'язково потрібно прикріпити до тягового пружинного троса.
5. Для швартування вертоліта його необхідно з'єднати з кільцем для швартування.

Exercise 19.7. Find the correct variant.

1. It's a secret. You tell anyone.
 - a. shouldn't
 - b. wouldn't
 - c. needn't
 - d. mustn't
2. Jane was so tired. She have slept for a week.
 - a. could
 - b. should
 - c. would
 - d. must
3. I didn't to get up early, so I didn't.
 - a. must
 - b. should
 - c. need
 - d. ought
4. She help you tomorrow.
 - a. could

- b. will be able to
 - c. will can
 - d. is able to
5. What shall we do this evening? We go out.
- a. should
 - b. could
 - c. would
 - d. ought to
6. You have just had lunch. You be hungry.
- a. can't
 - b. wouldn't
 - c. shouldn't
 - d. mustn't
7. We haven't got much time. We hurry.
- a. must
 - b. needn't
 - c. can
 - d. should
8. Take an umbrella. It rain later.
- a. might
 - b. should
 - c. would
 - d. can
9. Sue be able to help them.
- a. might
 - b. could
 - c. should
 - d. shall
10. I recommend you to apologize. You apologize.
- a. would
 - b. should
 - c. must
 - d. shall

Exercise 19.8. Complete the following sentences using the most appropriate forms of the verbs.

1. Jack has got a headache. He ... sleep well recently.
- a) can't
 - b) couldn't have
 - c) hasn't been able to
2. I ... sleep for hours when I was a little girl.
- a) could
 - b) am able to
 - c) can

3. Tom ... play tennis well but he ... play a game yesterday because he was ill.
a) couldn't, could
b) can, was able
c) can, couldn't
4. I didn't want to be late for the meeting. We ... meet at 5 sharp.
a) were to
b) had to
c) could
5. Where are my gloves? — I ... put them on because it's cold today.
a) can't
b) have to
c) needn't
6. You ... take an umbrella today. The Sun is shining.
a) needn't
b) mustn't
c) can't
7. I'm sorry, you didn't invite me to your birthday party. You ... invite me next time.
a) must
b) should
c) need to
8. Well, it's 10 o'clock. I ... go now.
a) can
b) has to
c) must
9. You ... smoke so much.
a) would
b) can't
c) shouldn't
10. We have got plenty of time. We ... hurry.
a) must
b) needn't
c) should

Exercise 19.9. Comment on the meaning of the verb may/might. Translate the sentences into Ukrainian.

1. He might have missed the train. 2. She may not have received the letter. 3. May I come in? 4. You might have told me earlier about it. 5. You may take any book you like. 6. Don't worry about her. She may be at her friend's house now. 7. I am sure you will soon hear from her. She may just be writing to you now. 8. You may think whatever you like. 9. The telegram may have been sent yesterday. 10. Nobody else is going to turn up now, so you may as well go home.

Exercise 19.10. Read the situations and make sentences from the words in brackets. Use may or might.

1. I can't find George anywhere. I wonder where he is.

- a. (he / go / shopping) *He may have gone shopping*
- b. (he / play / tennis) *He might be playing tennis*
2. I'm looking for Helen. Do you know where she is?
 - a. (she / watch / TV / in her room) _____
 - b. (she / go / out) _____
3. I can't find my umbrella. Have you seen it?
 - a. (it / be / in the car) _____
 - b. (you / leave / in the restaurant last night) _____
4. Why didn't Tom answer the doorbell? I'm sure he was in the house at the time.
 - a. (he / be / in the bath) _____
 - b. (he/not/ hear/the bell) _____

TEST UNIT 19

1. Write a word from the box in each space. You don't need all the words.

reduced / cruised / accelerated / idled / decelerated

1. I drove the car at 80 km/h. Then I saw a sharp bend in the road, so I _____ to ...30 km/h.
2. I stopped the car at the traffic lights and waited as the engine quietly _____.
...speed.
3. When the car reached 70 mph, I _____ for about ten minutes at the same
4. I saw an accident in the road ahead, so I _____ my speed from 70 to about ...10 mph.

2. Match these headings with the information in the box. Write a letter (A – D) next to each heading.

1. Operating principle: _____
2. Method of manufacture: _____
3. Benefits and drawbacks: _____
4. Recommended modifications: _____

- A The device is produced by assembling the small components into modules, and then assembling the modules into the finished product.
- B The new alarm system is based on a combination of laser technology and radar.
- C To improve the performance of the engine, a stronger seal should be used.
- D Fortunately, the car engine is clean and durable. However, it is quite noisy.

3. Write a word from the box in each space. You don't need all the words.

emission / consumes / emits / input / rotary / consumption / accelerates / rotation / acceleration / renewed / output / renewable

1. When the car _____ to a high speed, it uses power from the ultra-capacitor.
2. The power _____ from this new type of engine is 1020 kW.

3. This 4X4 vehicle has a high fuel _____: it does less than 5 km per liter offuel.
4. On a 3200-km journey, the average plane _____ one ton of CO₂ per passenger.
5. This lightweight hand-held power drill has a _____ speed of 3950 rpm.
6. We need to use _____ energy sources such as the wind and the sea.

4. Choose the correct answers. Write a letter (a – d) in each space.

1. The hand-held scanner pen is based _____ OCR technology.
a) on b) for c) of d) with
2. Walter and Johan _____ at Poznan University from 2007 until 2008.
a) have studied b) study
c) studied d) were studied
3. Radio signals are transmitted to the satellite, which then _____ the signals to Earth.
a) is transmitted b) transmitted
c) are transmitted d) transmits
4. The bridge was constructed using a new type of steel _____ was invented last year.
a) and b) which c) when d) it
5. How do you think the design of the new bicycle _____ be modified?
a) needs b) has c) should d) is
6. These earthquake-resistant houses were _____ using trusses or shear walls.
a) building b) build c) builded d) built
7. One major disadvantage of hydrogen fuel is _____ it is very expensive to manufacture.
a) that b) this c) since d) but
8. Last year a new oil field _____ under this part of the desert.
a) discovered b) was discovered
c) discovers d) was discovering
9. OK, so now _____ move on to the next topic on our agenda.
a) we let b) why not let's
c) let's d) let's we
10. These powerful new fire sprinklers should _____ in all our new buildings.
a) have installed b) install
c) be installing d) be installed
11. The purpose of my presentation today is _____ you our new product line.
a) for showing b) by showing
c) to show d) that show
12. The GPS system uses about thirty satellites _____ in orbit around the Earth.
a) positioned b) which positioned
c) are positioned d) positioning
13. Three years ago we purchased fifteen engines _____ General Motors.
a) which manufactured b) manufactured by
c) which were manufactured d) by manufacturer
14. I would like to end my lecture this morning by thanking you all _____ here.
a) you came b) to come
c) and coming d) for coming

UNIT 20. HELICOPTER CONTROL SYSTEM

Exercise 20.1. Read the text below.

Smile power

The expression on your face can actually dramatically alter your feelings and perceptions, and it has been proved that (1) smiling or frowning can create corresponding emotional responses. The idea was first (2) by a French physiologist, Israel Waynbaum, in 1906. He believed that different facial (3) affected the flow of blood to the brain, and that this could create positive or negative feelings. A happy smile or irrepressible (4) increased the blood flow and contributed to joyful feelings. But sad, angry expressions decreased the flow of oxygen-carrying blood, and created a vicious (5) of gloom and depression by effectively (6) the brain of essential fuel. Psychologist Robert Zajonc rediscovered this early (7), and (8) that the temperature of the brain could affect the production and synthesis of neurotransmitters - which definitely influence our moods and energy levels. He argues that an impaired blood flow could not (9) deprive the brain of oxygen, but create further chemical imbalance (10) inhibiting these vital hormonal messages. Zajonc goes on to propose that our brains remember that smiling is associated with being happy, and that by deliberately smiling through your tears you can (11) your brain to release uplifting neurotransmitters - replacing a depressed condition (12) a happier one. People suffering from psychosomatic (13), depression and anxiety states could (14) from simply exercising their zygomatic (15) - which pull the corners of the mouth up and back to form a smile - several times an hour.

Nº	A	B	C	D
1	desperately	determinedly	deliberately	decidedly
2	put off	put down	put by	put forward
3	aspects	looks	expressions	appearances
4	laughter	sadness	humour	depression
5	cycle	spiral	circle	vortex
6	cutting	starving	removing	eliminating
7	result	subject	research	experiment
8	advises	wants	demands	suggests
9	even	only	ever	always
10	by	without	when	from
11	make	persuade	allow	decide
12	through	by	after	with
13	disease	illness	infection	ailment
14	recover	improve	benefit	progress
15	muscles	nerves	veins	bones

1. *Exercise 20.2. Choose the synonym for the word in bold*

1. ability A. loss B. skill C. summery D. composition	2. benefit A. loss B. damage C. profit D. book	3. career A. job B. invention C. discovery D. chance	4. choice A. selection B. refuse C. necessity D. master
--	---	---	--

5. colleague A. agent B. competition C. partner D. paper	6. contract A. promise B. agreement C. sustainment D. congress	7. difficult A. lovely B. simple C. easy D. hard	8. expression A. feature B. reference C. certificate D. phrase
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Exercise 20.3. Read the text below. Complete the gaps (1-5) with the correct answers (A– D).

Why Does Red Mean Stop?

The 19th-century Scottish engineer Robert Stevenson, who was active in designing early lighthouses, (1)_____ for an alternative color to white - most lighthouses had a white beacon - when he built a lighthouse near to one that already existed, because he was afraid ships wouldn't be able to tell which was which.

Of the light sources and (2)_____ glasses available at the time, he found that red was a particularly intense light, meaning it (3)_____ from the greatest distance.

So in maritime signaling red became an alternative to white, and was later adopted by the Admiralty in 1852 (4)_____ the port-side on steam vessels. Green was adopted for the starboard-side, and vessels seeing the green light on (5)_____ ships had the right of way.

When train tracks were developed, engineers adopted this system as meaning stop and go - and the same system continued with cars.

No	A	B	C	D
1	has looked	looked	looks	looking
2	colourful	colours	colouring	coloured
3	could see	could be seen	have seen	be seeing
4	to mark	marked	mark	was marked
5	others	other	another	the others

Choose the correct form of the part of speech from A, B, C, D.

There are many kinds (1)_____ careers as there are people. They vary greatly in the type of work (2)_____ and in the ways they influence a person's life.

The kind of career you have can affect your life in many ways. For example it can determine where you live and the friends you (3)_____. It can reflect how (4)_____ education you have and can determine the amount of money you earn. Your career can also (5)_____ the way you feel about yourself and the way other people act toward you. To make wise career decisions and plans, you need as much information as possible. The more you (6)_____ about yourself and career opportunities, the better able to you (7)_____ to choose a satisfying career.

People differ in what they want from the career. Many people desire a high income. Some hope for (8)_____ fame. Others want adventure. Still others (9)_____ to serve people and make the world a better place.

Before you (10)_____ to explore career fields, you should determine your values, your interests, and your aptitudes. Most people are (11)_____ in jobs that fit their values. For example, money (12)_____ the strongest value for some people. As a

result, they focus their thoughts, behavior, and emotions on the goal of earning a high school. You can develop an understanding of your values by asking yourself what is most important to you and by examining your (13)_____. Or (14)_____ you rather be in charge or work alone? If (15)_____ working alone or being in charge is important to you, independence is probably one of your primary values.

№	A	B	C	D
1	in	at	of	with
2	involve	have involved	involved	will involve
3	has made	makes	will make	make
4	most	many	more	much
5	Is affecting	affected	affect	will affect
6	knows	know	will know	known
7	will be	would be	should be	will have been
8	a	-----	the	an
9	wanted	want	will want	wants
10	will begin	began	beginning	begin
11	happier	happy	happiest	more happier
12	are	were	will be	is
13	believes	believe	beliefs	belief
14	will	would	do	are
15	work	will work	working	worked

GRAMMAR

Повторення часових форм

Часи в англійській мові – це велика за обсягом частина граматики, яка налічує 12 часових форм та ще чотири додаткові групи Future in the Past, які наведені нижче в таблицях. Вони поділяються на чотири групи та чотири види часів.

Групи часів	Види часів
<ul style="list-style-type: none"> ▪ Минулий ▪ Теперішній ▪ Майбутній ▪ Майбутній в минулому 	<ul style="list-style-type: none"> ▪ Неозначений ▪ Тривалий ▪ Доконаний ▪ Доконаний тривалий

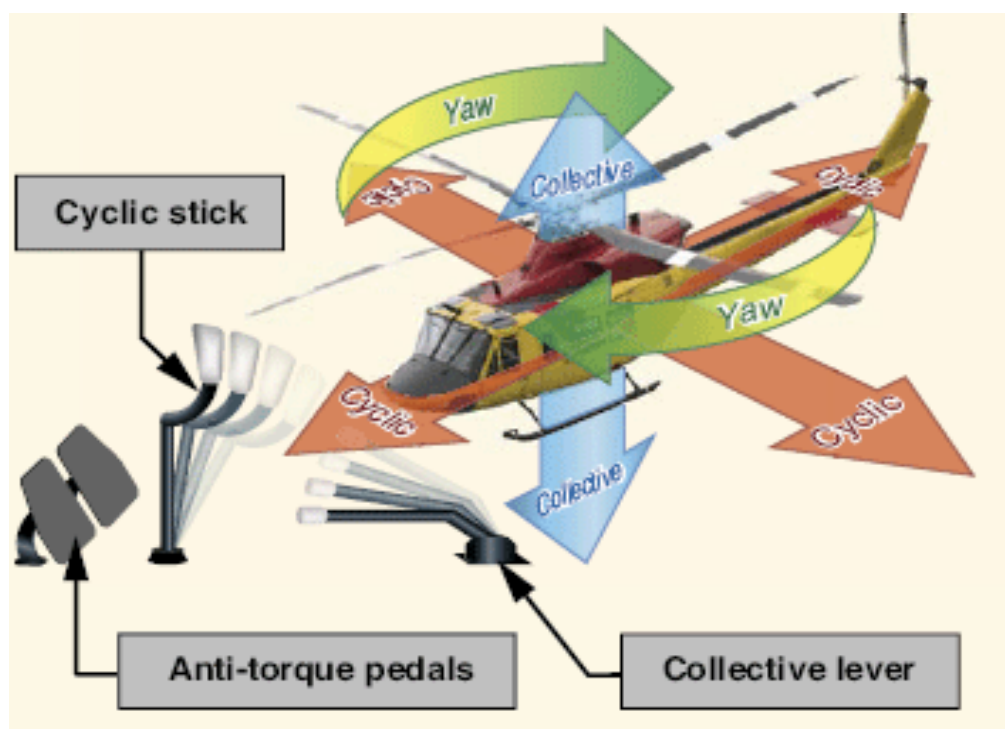
ASPECT		SIMPLE	PROGRESSIVE	PERFECT	PERFECT PROGRESSIVE
MEANING		<i>a common aspect</i>	<i>a process</i>	<i>priority</i>	<i>priority + process</i>
		When?	At what time?	By what time?	Since what time? How long?
Period of time		<i>usually, often, always, seldom, every day (week, month, year)</i>	<i>now, at the moment</i>	<i>ever, never, just, already, not...yet, by 3 p.m.</i>	<i>since 3 p.m., for a long time, for a month...</i>
Present	+	V, Vs	am is + Ving are	have has + Ved, V₃	have has + been + Ving
	?	do, does...V	inversion	inversion	inversion
	—	do, does + not + V	am, is, are + not + Ving	have, has + not + Ved, V ₃	have, has + not + been + Ving
Period of time		<i>yesterday, last week (month, year), long ago</i>	<i>yesterday at 3 p.m., yesterday from 6 till 7, when you came...</i>	<i>yesterday by 3p.m., before some time in the past...</i>	<i>yesterday since 3 p.m., for some time in the past</i>
Past	+	Ved, V₂	was were + Ving	had + Ved, V₃	had + been + Ving
	?	did...V	inversion	inversion	inversion
	—	did + not + V	was, were + not + Ving	had + not + Ved, V ₃	had + not + been + Ving
Period of time		<i>tomorrow, next week (month, year)</i>	<i>tomorrow at 3 p.m., tomorrow from 6 till 7, when you come</i>	<i>tomorrow by 3p.m., by some time in the future</i>	<i>tomorrow since 3p.m., for some time in the future</i>
Future	+	will + V	will + be + Ving	will + have + Ved, V₃	will + have + been + Ving
	?	inversion	inversion	inversion	inversion
	—	won't + V	won't + be + Ving	won't + have + Ved, V ₃	won't + have + been + Ving

Вибір форми часу в англійській мові, в якій потрібно сказати речення, залежить від того, як цю дію бачите саме ви.

READING

Read and translate the text.

TEXT A: «HELICOPTER CONTROL SYSTEM»



There are four basic controls used during flight. They are the collective pitch control, ISLs, the cyclic pitch control, and pedals.

The collective pitch control, located on the left side of the pilot's seat, changes the pitch angle of all main rotor blades simultaneously, or collectively, as the name implies. As the collective pitch control is raised, there is a simultaneous and equal increase in pitch angle of all main rotor blades; as it is lowered, there is a simultaneous and equal decrease in pitch angle. This is done through a series of mechanical linkages and the amount of movement in the collective lever determines the amount of blade pitch change. An adjustable friction control helps prevent inadvertent collective pitch movement.

Changing the pitch angle on the blades changes the angle of attack on each blade. With a change in angle of attack comes a change in drag, which affects the speed or r.p.m. of the main rotor. As the pitch angle increases, angle of attack increases, drag increases, and rotor r.p.m. decreases. Decreasing pitch angle decreases both angle of attack and drag, while rotor r.p.m. increases. In order to maintain a constant rotor r.p.m., which is essential in helicopter operations, a proportionate change in power is required to compensate the change in drag.

This is accomplished with the throttle control or a governor, which automatically adjusts engine power.

WORD LIST

- 1. basic – основний***
- 2. controls – органи управління***
- 3. collective pitch – важіль «ШАГ-ГАЗ»***
- 4. throttle – газ двигуна***
- 5. cyclic pitch – ручка циклічного кроку***
- 6. ISLs – важелі окремого управління***
- 7. pedal – педаль***
- 8. pitch angle – кут установки***
- 9. to lower – зменшувати***
- 10. simultaneous – одночасний***
- 11. collectively – в сукупності***
- 12. imply – спричинити***
- 13. to raise – піднімати***
- 14. equal – однаковий***
- 15. increase – збільшення***
- 16. decrease – зменшення***
- 17. mechanical linkage – механічний зв'язок***
- 18. amount – кількість***
- 19. movement – рух***
- 20. lever – важіль***
- 21. to determine – визначати, встановлювати***
- 22. adjustable – регулюючий***
- 23. friction – тертя***
- 23. inadvertent – довільний***

- 24. *angle of attack* – кут атаки
- 25. *drag* – опір
- 26. *affect* – діяти
- 27. *r.p.m (revolution per minute)* – оберти за хвилину
- 28. *to maintain* – підтримати, утримати, зберегти
- 29. *operation* – експлуатація
- 30. *proportionate* – пропорціональний
- 31. *to compensate* – урівноважити
- 32. *to accomplish* – виконувати, завершувати
- 33. *governor* – регулятор
- 34. *to adjust* – регулювати
- 35. *power* – потужність

Exercise 20.4. Answer the questions:

1. How many basic controls are used during the flight?
2. Where is the collective pitch located?
3. What prevents an adjustable friction control?
4. Do blades change the angle of attack during changing the pitch angle?

Exercise 20.5. Translate into English.

1. Використовують чотири основні органи управління під час польоту – управління ручкою «ШАГ-ГАЗ», ручкою циклічного ходу та важелями окремого управління, педалями.
2. При зміні кута установки лопаті також змінюється кут атаки на кожній лопаті.
3. При зміні кута атаки – змінюється опір.
4. Пропорційна зміна потужності необхідна, щоб компенсувати зміну опору.
5. Це одночасний процес зростання кута установки лопаті.

Exercise 20.6. Give Ukrainian equivalents.

The mechanical linkage, ISLs, angle of attack, a change in drag, automatically adjusts engine power, located on the left side, collective pitch movement, an adjustable friction, to compensate the change in drag, equal decrease in pitch angle.

Exercise 20.7. Read, translate and answer the question on the aviation talk.

TEXT B: «AVIATION TALK»

Instructor: Today are going to discuss some fundamental notions and ideas, pertaining to aircraft controls and to control theory in general...

Helen: I don't understand why should we delve into such complex matters as control theory. We already understand that to turn the aircraft to the right the pilot pushes the right pedal and the plane turns. Why should we complicate things?

Peter: Things become complex and the messy when there are too many in between. I understand that between the leg of the pilot and the rudder there are such go-betweens as autopilot, flight director, onboard computer and rudder actuator.

Helen: Are these devices really necessary?

Instructor: Pilots are only humans and sometimes commit piloting mistakes. The commands they issue are not always the best solutions of the given piloting problem. In flight pilots may get tired and inattentive. All these problems are successfully solved by back-up piloting devices.

Peter: What is primary flight control system?

Instructor: The *primary flight control system*, or *PFCS*, controls the aircraft flight attitude in relation to the three basic axes:

- Longitudinal;
- Lateral ;
- Vertical:

Helen: Presently we often speak about systems and systemic approach. What is meant, for instance, by the roll control system?

Instructor: The roll control system in modern airplanes, such as Boeing 777, uses the longitudinal axis. During a bank of the airplane, the aileron and flaperon on one wing move in an opposite direction from the aileron and flaperon on the other wing.

Peter: You have just introduced a new term “*flaperon*”. What does it actually mean?

Instructor: Flaperons are differential flaps used on Boeing 777 and some other new wide-body airplanes. When one flaperon is up, another flaperon is down.

Helen: Do spoilers assist in any way the operations of flaperons?

Instructor: They do. The spoilers move up only on the down wing and do not move on the up wing.

Peter: In modern technical manuals we also come across another system, called the pitch control system. Is it in any particular?

Instructor: It usually refers to all devices involved in controlling movements of the airplane about its lateral axis. The airplane may climb, dive, or it may maintain straight and level flight.

Helen: I understand that the word “straight and level” has some special meaning for all pilots. What is it?

Instructor: They simply mean that everything is in perfect order, no deviation are taking place.

WORD LIST

1. notion – поняття

2. pertaining – такий, що має відношення

3. flight controls – органи керування

4. to delve – досліджувати

5. to complicate – ускладнювати

6. messy – безладний

7. autopilot – автопілот

8. flight- director – командно-пілотажний прилад

9. actuator – механізм управління

10. to commit – здійснювати

11. solution – рішення

12. back up – дублюючий

- 13. roll control system – система управління крену**
- 14. flaperon – закрилок**
- 15. attitude – положення у просторі**
- 16. pitch control system – система управління крену**
- 17. straight and level flight – горизонтальний прямолінійний політ**
- 18. deviation – відхилення**

Exercise 20.8. Answer the questions:

1. What are flight controls used for?
2. What flight parameters can be controlled by the pilots?
3. What does the rudder do in flight?
4. Why does the pilot use the rudder often?
5. Does the rudder work itself?
6. What factors does efficiency of the rudder operation depend on?
7. What are ailerons? What are their functions in flight?
8. Why ailerons are called differential controls?
9. What kind of movement is rolling?
10. When does the pilot use pedals?

Exercise 20.9. Open the brackets using verbs in the Past Simple або Past Continuous.

1. I (to play) computer games yesterday.
2. I (to play) computer games at five o'clock yesterday.
3. He (to play) computer games from two till three yesterday.
4. We (to play) computer games the whole evening yesterday.
5. What Nick (to do) when you came to his place?
6. What you (to do) when I rang you up?
7. I (not to sleep) at nine o'clock yesterday.
8. What he (to do) yesterday? - He (to read) a book.
9. What he (to do) the whole evening yesterday? --He (to read) a book.
10. She (to sleep) when you came home?
11. My brother (not to play) tennis yesterday. He (to play) tennis the day before yesterday.
12. My sister (not to play) the piano at four o'clock yesterday. She (to play) the piano the whole evening.
13. When I came into the kitchen, mother (to cook).
14. She (to cook) the whole day yesterday.
15. We (to wash) the floor in our flat yesterday.

Exercise 20.10. Open the brackets using verbs in the Present Simple, Past Simple, Present Continuous, Past Continuous.

1. Nina (to celebrate) her birthday yesterday. Her room looked beautiful, there (to be) many flow-ers in it. When I (to come) in, somebody (to play) the piano, two or three pairs (to dance).
2. Listen! Somebody (to play) the piano.
3. I (to like) music very much.
4. When I (to look) out of the window, it (to rain) heavily and people (to hurry) along the streets.
5. What you (to do) at seven o'clock yesterday? - I (to have) supper.
6. When I (to come) home yesterday, I (to see) that all my family (to sit) round the table. Father (to read) a letter from my uncle who (to live) in Kiev.
7. Where you (to be) yesterday? — I (to be) at home the whole day. — How strange. I (to ring) you up at two o'clock, but nobody (to answer). — Oh, I (to be) in the garden. I (to read) your book and (not to hear) the telephone.
8. What you (to do) at five o'clock yesterday? — I (to work) in the library. — I (to be) there, too, but I (not to

see) you. 9. Yesterday I (to work) at my English from five till seven. 10. It (to rain) the whole day yesterday. 11. Where your sister (to be) now? — She (to be) in her room. She (to do) her homework.

Exercise 20.11. Open the brackets using verbs in one of the tenses: Present, Past, Future Simple; Present, Past Continuous.

1. Look at these children: they (to skate) very well. 2. You (to skate) last Sunday? — Yes, we (to skate) the whole day last Sunday. We (to skate) again next Sunday. 3. My brother can skate very well. He (to skate) every Sunday. 4. What you (to do) now? — I (to wash) the dishes. 5. What you (to do) at three o'clock yesterday? — I (to have) dinner. 6. You (to have) dinner now? 7. Where your brother (to work)? — He (to work) at an institute. 8. Your grandmother (to sleep) when you (to come) home yesterday? 9. What your brother (to do) tomorrow? 10. I (not to go) to the shop yesterday. I (to go) to the shop tomorrow. 11. Where Kate (to go) when you (to meet) her yesterday? 12. Every day the boss (to enter) the office at nine o'clock. 13. Yesterday the boss (to enter) the office at half past nine. 14. When the secretary (to come) tomorrow? 15. At six o'clock yesterday we (to listen) to a very interesting lecture.

Exercise 20.12. Open the brackets using verbs in the Present Continuous or in the Present Simple.

1. I (not to drink) coffee now. I (to write) an English exercise. 2. I (not to drink) coffee in the evening. I (to drink) coffee in the morning. 3. Your friend (to do) his homework now? 4. Your friend (to go) to school in the morning? 5. Look! The baby (to sleep). 6. The baby always (to sleep) after dinner. 7. My grandmother (not to work). She is on pension. 8. My father (not to sleep) now. He (to work) in the garden. 9. I usually (to get) up at seven o'clock in the morning. 10. What your sister (to do) now? — She (to wash) her face and hands. 11. When you usually (to come) home from school? — I (to come) at three o'clock. 12. Where your cousin (to work)? — He (to work) at a hospital. 13. Your sister (to study) at an institute? — No, she (to study) at school. 14. My cousin (to go) to school every day. 15. My mother (not to play) the piano now. She (to play) the piano in the morning. 15. I (to read) books in the evening. 16. I (not to read) books in the morning. 17. I (to write) an exercise now. 18. I (not to write) a letter now. 19. They (to play) in the yard now. 20. They (not to play) in the street now. 20. They (to play) in the room now? 21. He (to help) his mother every day. 22. He (to help) his mother every day? 23. He (not to help) his mother every day. 24. You (to go) to school on Sunday? 25. My friend (not to like) to play football. 26. I (not to read) now. 28. He (to sleep) now? 29. We (not to go) to the country in winter. 30. My sister (to eat) sweets every day. 31. She (not to eat) sweets now. 32. They (to do) their homework in the afternoon. 33. They (not to go) for a walk in the evening. 34. My father (not to work) on Sunday. 35. He (to work) every day.

TEST UNIT 20

Quick Placement Test

Try to answer all 45 questions. There is one mark per question. Write one answer from the four possible answers.

For example:

Where c you live?

a) does b) are c) do d) is

1. What _____ your job?
a) are b) do c) it's d) is
2. Peter _____ an electrician.
a) works b) is c) does d) working
3. How many nails _____ you need?
a) do b) is c) does d) are
4. How do you _____ your surname?
a) wrote b) writes c) write d) written
5. What _____ that lever do?
a) are b) does c) is d) do
6. Does Tom's bicycle _____ a dynamo?
a) having b) had c) have d) has
7. Who _____ answer my question?
a) are b) has c) want d) can
8. What _____ when you push that pedal down?
a) happens b) happening
c) happened d) happen
9. The students _____ working in the laboratory today.
a) can't b) don't c) aren't d) won't
10. The engineer _____ to Dubai for a meeting every month.
a) flies b) is fly c) fly d) flown
11. Spark plugs are made _____ a heat-resistant material.
a) to b) of c) for d) by
12. The radio _____ work because the batteries are flat.
a) isn't b) don't c) hasn't d) doesn't
13. How _____ the sea under the bridge?
a) deep b) the depth of c) deep is d) is deep
14. My car _____ down last week in the desert.
a) broke b) break c) brokend) has broken
15. How _____ sand is in that bag?
a) any b) much c) some d) many
16. The TV company launched the satellite _____ September last year.
a) on b) from c) at d) in
17. You _____ smoke in the workshop.
a) mustn't b) haven't c) aren't d) weren't
18. The electrician has _____ the fuses in the factory.

- a) repair b) repairs c) repaired d) done repair
19. Have they installed the new computer yet? No, _____.
a) have not b) they haven't
c) they not d) haven't they
20. When _____ the accident happen?
a) do b) has c) did d) was
21. The small gear makes the large gear _____ quickly.
a) rotate b) rotates c) to rotate d) rotating
22. How high _____ the plane when the accident happened?
a) flew b) was c) is d) flies
23. In a suspension bridge, the road is suspended _____ very strong cables.
a) to b) at c) from d) on
24. The water tower is about one metre _____ the building.
a) to left of b) of the left to
c) to left d) to the left of
25. Why did the security man allow the driver _____ the warehouse?
a) entering b) enter
c) to enter d) for entering
26. He picked up the spark plug and inspected it. Then he put _____ again.
a) it down b) down c) down it d) it
27. This heavy gate will prevent thieves _____ the warehouse.
a) by entering b) for enter
c) to enter d) from entering
28. "Has he repaired the brakes yet?" "No, not yet. _____ them."
a) He still repairs b) He's still repairing
c) He still is repairing d) He's still repair
29. The workman rang the alarm bell by _____ the alarm button.
a) press b) pressing
c) presses d) pressed
30. Diesel engines are usually much _____ than petrol engines.
a) noisy b) noisier c) noisier d) too noisy
31. The safety inspectors _____ your oil platform tomorrow.
a) will to visit b) want visit
c) to visit d) are visiting
32. Nowadays, car bodies _____ by robots, but checked by human workers.
a) paint b) painted c) are painting d) are painted
33. Would you mind _____ me when you plan to deliver my goods?
a) you inform b) please inform
c) informing d) inform
34. About fifteen computer discs _____ from our company last year.
a) stole b) were stolen
c) were stealing d) stolen
35. Sprinklers were installed in the laboratory _____ protect it from fire.
a) to b) for c) and d) so
36. _____ you please send your latest catalogue to my office?

- a) Have b) Do c) Could d) Should
37. A mobile phone is an electronic device _____ sends and receives voice and text messages.
- a) which it b) that c) who d) that it
38. This food must _____ at temperatures below 10°C
- a) to keep b) be keeping
c) you keep d) be kept
39. “What’s this instrument for?” “It’s for _____ the area of a wall”.
- a) measuring b) measurement
c) measure d) measures
40. If your car doesn’t start, why don’t you try _____ the battery.
- a) recharge b) you recharge
c) recharging d) for recharging
41. A _____ is a device which sends radio signals to an antenna or satellite dish.
- a) transmission b) transmit c) transmitted d) transmitter
42. Five new first aid kits should _____ for our new training centre.
- a) be bought b) to buy c) buy d) have bought
43. If your new radio isn’t working, you must _____ to put batteries in.
- a) forgot b) be forget c) have forgotten d) forget
44. The GPS satellite system can calculate _____ anywhere on Earth.
- a) where your location b) your location
c) where are you d) you’re located
45. My car has two antennas _____ to the roof
- a) which attached b) attached
c) are attached d) attach

FINAL UNITS TEST

1. Duties of a flight engineer.

- A. I do not do much work on the ground;
- B. I do not handle the controls for the land gear;
- C. flight engineers are not the members of flight crews;
- D. I sit between the Captain and co-pilot during the flight;

2. Who handles the controls for the land gear?

- A. rudder;
- B. flight engineer;
- C. pilot;
- D. main gear;

3. Who are the members of the ground crew?

- A. aircraft technical, mechanics;
- B. pilots;
- C. air bone personnel;
- D. airman;

4. My job as an aircraft technical is ____.

- A. to know all about the air planes;
- B. to inspect the rudder;
- C. to maintain, overhaul and repair big air planes;
- D. to sit between the Captain and co-pilot during the flight;

5. What factors influence the number of runways, their length and location?

- A. the number of people;
- B. apron taxiway;
- C. the volume and character of traffic, the prevailing wind direction;
- D. aeronautical charts, taxiway strip;

6. How we can translate the word “flaps”?

- A. крила;
- B. щитки;
- C. лебідка;
- D. шасі;

7. Aircraft is ____.

- A. a vehicle which is able to fly by being supported by birds;
- B. a vehicle which is able to fly by the car;
- C. ship which is able to fly by being supported by the air;
- D. a vehicle which is able to fly by being supported by the air;

8. Lighter than air can be ____.

- A. zeppelin;
- B. glider;
- C. helicopter;
- D. airplane;

9. Translate “rotary wing aircraft”.

- A. закінцівка нерухомого крила вертольоту;
- B. кермовий гвинт вертольота;
- C. літаки з поворотним крилом;
- D. вантажний літак середньої важкості;

10. The definition for the word “aerobatics” is ____?

- A. displays may be performed by military pilots;
- B. is one of the safest way of becoming airborne providing;
- C. a force that will push it up into the air;
- D. is receiving;

11. Translate the word “airframe”.

- A. крило;
- B. планер;
- C. транспортний засіб;
- D. корпус;

12. What is a meaning of the word “application”?

- A. an official document with spaces where you have to answer questions and provide information;
- B. a group of government officials, headed by an ambassador;
- C. a formal, usually written, request for something such as a job;
- D. an official document given by a government to a citizen containing his or her name;

13. What is a meaning of the word “smuggling”?

- A. a place where your bag is checked for illegal drugs, guns, etc. when you go into a country;
- B. a limit, especially an official limit, on the number or amount of something that is allowed in a particular period;
- C. the crime of taking things from one country to another;
- D. an official rule or order;

14. Helicopters come in many sizes and shapes, but most share the same major components. They are: ____.

- A. cabin, main rotor system, transmission, power plant;
- B. cabin, airframe, main rotor system, transmission, power plant, landing gear, tail rotor system;
- C. main rotor system, transmission, power plant, landing gear, tail rotor system;
- D. airframe, main rotor system, transmission, power plant, landing gear;

15. Principal structural units of the airplane are ____.

- A. The airplane consists of three principal structural units: the tail unit, the landing gear and the power plant.;
- B. The airplane consists of four principal structural units: the wing, the tail unit, the landing gear and the power plant.;
- C. The airplane consists of five principal structural units: the fuselage, the wing, the tail unit, the landing gear and the power plant.;
- D. The airplane consists of two principal structural units: the landing gear and the power plant.;

16. The fuselage serves several purposes such as: ____.

- A. it carries the crew, controls, equipment, passengers, and cargo;
- B. it carries the crew, controls, passengers, and cargo;
- C. it carries controls, equipment, passengers, and cargo;
- D. it carries the crew, controls, equipment, passengers;

17. Semimonocoque construction is ____.

- A. stress skin, bulkheads and formers, stringers, firewall;
- B. stress skin, bulkheads and formers, stringers, wing attachment point, firewall;
- C. stress skin, bulkheads, stringers, wing attachment point, firewall;
- D. stress skin, bulkheads and formers, wing attachment point, firewall;

18. The fuselage extends from the nose to the tail of the machine. The fuselage is divided into: ____.

- A. into the front fuselage, centre fuselage;
- B. into the front fuselage, centre fuselage, tail and rear fuselage;
- C. into the front fuselage, centre fuselage and rear fuselage;
- D. into the front fuselage and rear fuselage;

19. How many main types of the fuselage construction are there?

- A. 3;
- B. 2;
- C. 4;
- D. 5;

20. What is the main structural unit of the aeroplane?

- A. The front fuselage is the main structural unit of the aeroplane;
- B. The landing gear or tail is the main structural unit of the aeroplane;
- C. The wheel or undercarriage is the main structural unit of the aeroplane;
- D. The landing gear or undercarriage is the main structural unit of the aeroplane;

21. The function of the landing gear is ____.

- A. to support the airplane in the air;
- B. to contain the power plant;
- C. to provide directional control in flight;
- D. support the airplane on the ground;

22. _____ forms principal support of the airplane on the ground.

- A. The auxiliary landing gear;
- B. The nose landing gear;
- C. The main landing gear;
- D. The tricycle landing gear;

23. The landing gear usually consists of ____.

- A. the front fuselage and rear fuselage;
- B. main and auxiliary units;
- C. stress skin, bulkheads, stringers, wing attachment point, firewall;
- D. the crew, controls, equipment, passengers, and cargo;

24. The basic parts of the main rotor hub assembly are as follows ____.

- A. blade turning arms, hydraulic dampers, centrifugal droop limiters;
- B. hub body, drag hinges, feathering hinges, blade turning arms;
- C. hub body, drag hinges, feathering hinges, blade turning arms, hydraulic dampers, centrifugal droop limiters, a vibration suppressor of pendulum-type;
- D. stress skin, bulkheads, stringers, wing attachment point, firewall;

25. From the cockpit all controls used in flying and landing.

- A. Furnishing, instruments, and equipment are installed in it in accessible positions.;

- B. it carries the crew, controls, passengers, and cargo;
- C. body, drag hinges, feathering hinges, blade turning arms;
- D. stress skin, bulkheads, stringers, wing attachment point, firewall;

26. Translate “freight door”.

- A. вхідні двері;
- B. вантажні двері;
- C. допоміжні двері;
- D. головні двері;

27. The mechanic’s duties are _____.

- A. members of flight crews who make sure the mechanical and electrical devices aboard airplanes work properly;
- B. walk around the aircraft and make an inspection;
- C. Mechanics are responsible for installing and dismantling the components they produce either manually or with machines;
- D. sit between the captain and the co-pilot (behind the navigator) and look at the engine instruments.;

28. The Power Plant is designed to _____.

- A. create power, which is required to rotate the main rotor and the tail rotor as well as for drive of auxiliary units;
- B. landing gear or tail is the main structural unit of the aeroplane;
- C. the fuselage, the wings, the flight control surface and the landing gear;
- D. stress skin, bulkheads, stringers, wing attachment point, firewall;

29. The elements of the airframe are _____.

- A. Furnishing, instruments, and equipment are installed in it in accessible positions.;
- B. the fuselage, the wings, the flight control surface and the landing gear;
- C. the wings, the flight control surface and the landing gear;
- D. main rotor system, transmission, powerplant, landing gear, tail rotor system;

30. Translate “main landing gear strut”.

- A. механізм пружинного типу;
- B. система органів управління вертольоту;
- C. стійка головного шасі;
- D. хвостова опора;

31. The fuel system is designed to _____

- A. arrange fuel on the helicopter and to supply it to the both engines, APU and to the kerosene heater at all ratings of flight;
- B. landing gear or tail is the main structural unit of the aeroplane;
- C. the fuselage, the wings, the flight control surface and the landing gear;
- D. stress skin, bulkheads, stringers, wing attachment point, firewall;

32. Airplanes may be also divided into _____ types.

- A. two;
- B. four;
- C. three;
- D. five;

33. The oil system is responsible for ____.

- A. to support the airplane in the air;
- B. to contain the power plant;
- C. to provide directional control in flight;
- D. lubrication and cooling of the moving parts of the engine;

34. Tank is ____.

- A. any device that shuts off, starts, regulates, or controls the flow of a fluid;
- B. a large container or reservoir for the storage of liquids or gases;
- C. transparent cloth of loose plain or leno weave;
- D. a protective case or cover;

35. The oil is delivered by ____.

- A. oil servicing tank;
- B. gas servicing truck;
- C. a petroleum servicing tank;
- D. stress skin, bulkheads;

36. The fire extinguishing system consists of the fire extinguishing agent containers-

- A. the distribution lines, indicating lights.;
- B. the distribution lines, a control circuit;
- C. a control circuit, and indicating lights.;
- D. the distribution lines, a control circuit, and indicating lights;

37. The compressor air inlet housing, is anti-iced by ____.

- A. gas conduction;
- B. heat conduction;
- C. air conduction;
- D. fuel conduction

38. The burning fuel within the cylinders produces intense heat, most of which is expelled through the ____.

- A. exhaust;
- B. gas;
- C. a petroleum servicing tank;
- D. bulkheads;

39. The lubrication system consists of ____.

- A. the distribution lines, indicating lights.;
- B. oil pan, oil pump, distribution lines, a control circuit;
- C. oil pan, oil pump, oil filter and other control circuit, and indicating lights.;
- D. oil pan, oil pump, oil filter and other external parts which supply oil to the moving parts in the engine block;

40. There are four basic controls used during flight. They are ____.

- A. gas conduction, ISLs, the cyclic pitch control, and pedals;
- B. collective pitch control, ISLs, the cyclic pitch control, and pedals;
- C. air conduction, collective pitch control, ISLs, the cyclic pitch control;
- D. fuel conduction, the cyclic pitch control;

41. Flight instruments are the instruments in the cockpit of an aircraft that provide the pilot with information about ____.

- A. the flight situation of that aircraft, such as altitude, speed and direction;

- B. collective pitch control, ISLs, the cyclic pitch control, and pedals;
- C. a petroleum servicing tank;
- D. oil pan, oil pump, distribution lines, a control circuit;

42 The Mi-8 helicopter is a single main rotor _____ transport aircraft with a tail rotor.

- A. constant;
- B. medium;
- C. centre;
- D. speed;

43. Translate “dent”.

- A. тріщина;
- B. вм’ятина;
- C. зношення;
- D. тертя;

Навчальне видання

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АНГЛІЙСЬКА МОВА ДЛЯ ТЕХНІЧНИХ СПЕЦІАЛЬНОСТЕЙ

Навчально-методичний посібник

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