МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ МОРСЬКИЙ УНІВЕРСИТЕТ

Кафедра «Іноземні мови та переклад»

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ENGLISH LANGUAGE OF SCIENTIFIC COMMUNICATION

Навчальний посібник для здобувачів другого (магістерського) рівня навчально-наукового інституту інформаційних технологій та інноваційного підприємства за спеціальностями F3 «Комп'ютерні науки»/F5 «Кібербезпека та захист інформації» денної та заочної форм навчання

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ПЕРЕДМОВА

У сучасному глобалізованому світі англійська мова стала необхідним інструментом для спілкування, навчання, кар'єрного зростання. Незалежно від походження чи місця проживання, знання англійської мови дозволяє легко обмінюватися ідеями, знаннями та досвідом з колегами, партнерами та людьми з усього світу. Англійська мова є одним із факторів успіху. Вона використовується в бізнесі, юриспруденції, політиці, економіці, наукових дослідженнях, туризмі та інших сферах життя. Володіння англійською мовою дозволяє легко спілкуватись з представниками інших країн.

Навички англійської мови розширюють можливості працевлаштування та розвитку кар'єри, адже велика кількість міжнародних компаній мають офіси та філії в різних країнах світу, що потребує знання іноземних мов.

Сьогодні знання іноземних мов – це, перш за все, ключ до успіху та нових можливостей, які відкриваються перед людиною та, в умовах глобалізаційних процесів, які відбуваються у сучасному світовому суспільстві, є просто необхідною складовою професійної діяльності фахівця будь-якого рівня та будь-якої сфери.

Соціальні мережі, блоги, форуми та інші платформи для спілкування також використовують англійську як основну мову. Люди з різних країн обмінюються досвідом, ідеями та думками саме англійською, створюючи глобальну комунікаційну спільноту. Можливість спілкуватися з людьми з усього світу не лише розширює світогляд, але й допомагає створювати професійні контакти, що може бути корисним у будь-якій галузі.

Англійська мова відкриває доступ до глобальної наукової бази даних. Ті, хто вивчає або працює у науковій сфері, можуть легко ознайомлюватися з останніми дослідженнями та бути в курсі новітніх відкриттів. Співпраця між вченими з різних країн часто відбувається саме завдяки їй, що сприяє розвитку інновацій та прогресу у різних галузях, таких як медицина, комп'ютерні технології, біотехнології, фізика, штучний інтелект тощо.

Англійська мова стала невід’ємною частиною сучасного світу. Вона є мовою бізнесу, науки та інтернет-комунікацій, об’єднуючи людей з різних країн та культур. Знання англійської мови – це ключ до нових можливостей, як у професійному плані, так і в особистому розвитку. Вона не лише відкриває двері до глобальних ринків та знань, але й сприяє кращому розумінню світу, який стає все більш взаємопов’язаним.

Навчальний посібник «English Language of Scientific Communication» призначено для здобувачів другого (магістерського) рівня за спеціальностями F3 «Комп'ютерні науки» і F5 «Кібербезпека та захист інформації». Він містить актуальну інформацію щодо оволодіння навичками наукового

спілкування та може бути використаний для самостійного опрацювання матеріалу з означеної дисципліни.

Таким чином, як вже було зазначено вище, метою дисципліни «Англійська мова наукового спілкування» є розвиток мовних і комунікативних навичок, необхідних для ефективного функціонування в міжнародному академічному та науковому середовищі. Це включає здатність ефективно використовувати англійську мову для участі у наукових дискусіях, роботі з науковими текстами (статтями, тезами, звітами тощо), підготовки презентацій з зазначених тем, написання есе, міжкультурній комунікаціїї в академічній та науковій спільноті, роботі з автентичними англомовними науковими джерелами.

Навчальний посібник містить велику кількість різноманітних вправ, спрямованих на формування професійно-орієнтованої англомовної комунікативної компетентності для наукової діяльності в галузях ІТ, комп'ютерних наук і кібербезпеки, а саме на такі аспекти, як застосування фахової термінології англійською мовою у сфері ІТ, програмування, мереж, безпеки даних; робота з науковими текстами (статтями, тезами тощо); читання, переклад, реферування та критичний аналіз англомовних наукових публікацій; пошуку інформації в базах даних (IEEE, ACM Digital Library тощо); написання есе, тез, анотацій, рецензій, структурування наукової статті; пошуку ключових слів; підготовки презентацій та підготовки до участі в міжнародних конференціях, симпозіумах, воркшопах.

UNIT I

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Everybody gets so much information all day long that they lose their common sense. They listen so much that they forget to be natural. This is a nice story». ***Gertrude Stein***

2. Discuss the following questions.

- Do you like the century we live in?
- What is information?
- Can you imagine your life without computers and modern gadgets?
- What is information technology in simple terms?
- What are some examples of using information technology in the educational process?
- What would life be like without modern technology?
- What are the 10 modern technologies?
- What are the positive consequences of modern technologies?
- What are the negative consequences of modern technologies?
- Give three examples of modern technologies that we successfully use today.

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Abacus
Addition
Analytical Machine Calculations
Central Processing Unit (CPU)

Computer
Counting Machine
Device
Digital Data
Division
Gear
Information Science
Memory
Multiplication
Specified
Subtraction
To perform an operation
Transmit
Peripherals

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) contemporary	a) mechanism
2) to invent	b) to realize
3) to perform	c) modern, up-to-date
4) to process	d) figure
5) gear	e) appliance
6) device	f) to make, to produce
7) to create	g) to construct
8) digit	h) to fulfill
9) data	i) to devise
10) to implement	j) information

5. Read, translate and comment on the meaning of the statement.

People need to do counting every day, and the more we live the more there is to count. Nowadays performing primitive arithmetical operations – addition, subtraction, division and multiplication is not enough. Our life arithmetic becomes as complicated as our life is. We need to count not only our food supply,

but also some abstract notions – educational, financial, cultural, sport achievements, different kinds of information etc.

6. Complete the sentences with the words given below.

abacus multiplication addition Information Science subtraction memory peripherals (peripheral devices)

1. When two numbers are added it is the process of _____.
2. The ancient used _____ to do various calculations.
3. _____ is when one number is taken away from another.
4. _____ helped the ancient count their food supply.
5. People and machines store information in _____.
6. The science that concerns information processing is called _____.
7. When a number is doubted, tripled etc. it is _____.
8. Keyboard, mouse, printer etc. are all _____.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of each gear described in the text.

THE NOTION OF COMPUTER. THE VON NEUMANN'S SCHEME

Computer is a machine used for fulfilling a specified, strictly defined sequence of actions dealing with information processing.

Attempts to invent a gear, that would be able to make calculations, root deeply into the human history. It was in the extreme antiquity that the well-known abacus was invented. Later appeared more complicated machines made by a French mathematician Blaise Pascal (1623 – 62) and German mathematician Baron Gottfried Wilhelm von Leibniz. Pascal's counting machine could perform only two operations – addition and subtraction, Leibniz's machine performed all the four operations – addition, subtraction, division and multiplication.

In 1823 an English mathematician Charles Babbage materialized the idea of a device for processing digital data. He called his invention-Analytical Machine. This machine could store the numbers that were processed.

In 20 years after his death an American scientist Herman Hollerith created electro-mechanical counting machine.

Later in the end of 1930s – at the beginning of 1940s in Germany several counting machines for fulfilling complicated engineer calculations were built up.

In June 1945 a scheme of a contemporary computer was suggested by John Von Neumann (Janos, 1903 – 57) – an American scientist of Hungarian origin.

According to this scheme a computer consists of two main parts: memory and central processing unit (CPU).

Central Processing Unit is the main working element of the computer used for processing information. Memory is used to store information for further extracting and transformation.

Peripherals are devices necessary to provide data interchange between human and machine with the aim to do a concrete sum.

Data input devices help enter information into computer so that it can be further processed.

Data output devices serve for information outlet.

So, the memory stores the information and the CPU works with it.

Information stored in the memory consists of data and methods of their processing.

For achieving data interchange between human and computer the so-called peripherals were included into its scheme.

Some of them are used to enter the information into computer; these peripherals are called data input devices. Others serve for information outlet. Such facilities are called data output devices.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Computer is a machine used for fulfilling a specified, strictly defined sequence of actions dealing with information processing.

2. The well-known abacus has been invented recently.

3. More complicated machines made by a French mathematician Blaise Pascal (1623 – 62) and German mathematician Baron Gottfried Wilhelm von Leibniz appeared in ancient times.

4. Pascal's counting machine could perform only two operations – addition and subtraction.

5. Leibniz's machine performed all the four operations – addition, subtraction, division and multiplication.

6. The Analytical Machine, which was invented by Charles Babbage in 1823, couldn't store the numbers that were processed.

7. A German scientist Herman Hollerith created electro-mechanical counting machine.

8. Later in the end of 1930s – at the beginning of 1940s in Germany several counting machines for fulfilling complicated engineer calculations were built up.

9. A contemporary computer, invented by John Von Neumann consisted of two main parts: memory and Central Processing Unit (CPU).

10. Peripherals weren't included into the scheme for achieving data interchange between human and computer.

9. Answer the following questions and retell the text.

1. What requirements should information meet to become comprehensible to any computer?

2. What methods of information coding do you know?

3.Give examples of coding of different types of information by means of ciphers.

1. 4. How many ciphers does the language understandable to a computer contain? What does it concern?

5. What is a bit?

10. Talking points and discussion.

1. What is the difference between computer science and information technology?

2. What is the easiest IT profession? Ground up your opinion.

3. Make a list you use computers at work and in your free time.

4. Make a list of key ways of presenting information on the Internet.

11. Prepare a short presentation about the positive and negative impact of information on our modern life. Use the following introductory words and phrases to sound logical and clear.

1. Let me draw your attention to the issue of…/Let me introduce you to the issue of…

2. It's common knowledge that…/So far is known…

3. On the one hand… on the other hand…

4. In addition…/Moreover…/Furthermore…/Besides…/To add to this…

5. In conclusion…/To sum it up…/In a nutshell…/Summing it up…

GRAMMAR ASSIGNMENTS

12. Using the Passive Voice

Objective: An exercise in converting active sentences into passive ones, which is typical for scientific texts.

Convert the following sentences into the passive voice:

1. Developers implement machine learning algorithms in Python.
2. The company launched a new cybersecurity protocol.
3. Researchers tested the new model on real-world datasets.

13. Grammatical tenses in academic writing

Objective: Correct use of tenses (especially Present Simple, Present Perfect, and Past Simple) in describing processes and research.

Choose the correct tense:

1. Many researchers (use / used / have used) convolutional neural networks for image recognition.
2. In 2020, the team (develops / developed / has developed) a new blockchain protocol.
3. Our model (shows / showed / has shown) high accuracy in preliminary experiments.

14. Subject-Verb Agreement

Objective: Practicing correct agreement, especially with IT terms (data, algorithm, system, etc.).

Choose the correct verb form:

1. The data (is / are) stored in the cloud.
2. An efficient algorithm (reduce / reduces) processing time.
3. Each of the systems (require / requires) regular updates.

15. Nominalization

Objective: Transform verbs into nouns for academic style.

Transform the sentences using nominalization:

1. The team analyzed the results.
2. We improved the performance of the system.
3. They implemented the model quickly.

16. Using modal verbs in a technical context

Objective: Expressing possibility, necessity, recommendations.

Insert the appropriate modal verb: can, should, must, might.

1. The system ___ be upgraded to meet the new requirements.
2. Developers ___ test the application thoroughly before release.
3. AI tools ___ help improve code quality.

UNIT II

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «The PC has improved the world in just about every area you can think of. Amazing developments in communications, collaborations and efficiencies. New kinds of entertainment and social media. Access to information and the ability to give a voice people who would never have been heard». ***Bill Gates***

2. Discuss the following questions.

- Can you define what a computer is?
- Do you know a lot about computers?
- In what ways have computers transformed our lives?
- Do you think it is normal for parents to let children spend their free time on the computer?
- How old were you when you first sat down at a computer?
- Which is faster, the brain or the computer?
- What types of computers are there?
- What is better to buy an assembled PC or assemble it yourself?
- What professions require a powerful computer?
- What do you call a person who is very good with computers?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Binary
Bit
Cipher
Concrete

Convenient
Correspond
Digit
Equiprobable
Event
Invent
Monosemantic
Possess
Probability
Represent
Source information
Stave
Symbol
Unambiguously
Unified

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) unambiguously	a) credibility
2) event	b) to have
3) concrete	c) to match
4) convenient	d) to depict
5) monosemantic	e) twin, dual
6) to possess	f) appropriate
7) to correspond	g) specific
8) probability	h) unambiguous
9) to represent	i) occasion
10) binary	j) definitely

5. Read, translate and comment on the meaning of the statement.

$$\text{Probability of an event} = \frac{\text{number of } \textit{successful} \text{ outcomes}}{\text{number of } \textit{possible} \text{ outcomes}}$$

Equiprobable events are those that may happen with equal probability. For example, you are going to take an examination and you have only studied half of the necessary questions. It is equally possible that you will pass the exam or you

will not. So, a bad result is equiprobable to a good result. Here is one more example: you are asked a question and given two optional answers, it is equiprobable that you will give the right answer if you do not know it for sure. So, both answers are equiprobable.

6. Insert the necessary prepositions.

My computer stands … in my room. The monitor is … the desk. The speakers are placed … its both sides. The keyboard is a special slide … and … desktop. The case is… the floor … the table. The mouse is … the same place as the keyboard. The scanner is put … the top … the case. The printer is … the shelf built … the table. It is so convenient to work when everything is … order and … its places.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of codes and ciphers.

UNIFIED METHOD OF PRESENTING INFORMATION

It may be stated that source information in different situations is of different types. For computer to be able to process this information it is necessary that it should be represented in a unified method, comprehensible to computer. Thus, there should be a language by means of which a computer could be able to «read» and process any kind of information. Suchlike language should possess the feature of representing information in the way that it could be understood by machine unambiguously, in other words in a unified way.

Such phrases as «as drunk as a log», «to kick the bucket», «it's raining cats and dogs», «to beat a fool around» are samples of ambiguous language information. A log cannot drink alcohol, when one kicks the bucket, he hits it with his foot; at the same time this phrase may mean to die, it usually rains water but in no case cats and dogs.

From the examples given it is clear that the information being presented to the computer should be concrete and monosemantic.

Long ago people invented and began using different codes. The most convenient and simple are digital codes. For instance, main colours of rainbow are red, orange, yellow, green, blue, azure and violet. They can be numbered from «1» to «7». Musical compositions are written with help of notes. The main notes of the stave do, re, mi, fa, sol, la, si can be represented the same way.

So, different types of information (colours, notes, days of the week and so on) can be presented in a unified way – by means of digits.

For computer to be able to understand the information it should be coded into numbers written by means of ciphers.

The ciphers are transferred into electric signals. To make it the most convenient signals of two levels are used. One of them corresponds to the cipher 1 and the other – to the cipher 0. 1 and 0 are binary numbers. They are symbols that produce a language comprehensible for computer. Information that computer works with is coded with the help of this language.

The smallest amount of information is one of these two meanings – 0 or 1. This amount of information is called bit (from binary digit).

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. It may be stated that source information in different situations is of different types.

2. For computer to be able to process this information it is necessary that it should be represented in a unified method, comprehensible to computer.

3. Such phrases as «as drunk as a log», «to kick the bucket», «it's raining cats and dogs», «to beat a fool around» are samples of unambiguous language information.

4. Only a few years ago people invented and began using different codes.

5. Digital codes are considered to be the most convenient and simple.

6. Different types of information (colours, notes, days of the week and so on) can be presented in a unified way – by means of digits.

7. For computer to be able to understand the information it should be coded into numbers written by means of ciphers.

8. Later in the end of 1930s – at the beginning of 1940s in Germany several counting machines for fulfilling complicated engineer calculations were built up.

9. The ciphers are transferred into acoustic signals. To make it the most convenient signals of three levels are used.

10. The smallest amount of information is one of these two meanings – 0 or 1. This amount of information is called bit (from binary digit).

9. Answer the following questions and retell the text.

1. What is a computer?

2. What does computer consist of? Enumerate the basic components of it.

3. Describe the Von Neumann's scheme in general.

4. What is CPU used for?

5. What is there stored in the computer's memory?

6. What are peripherals? Why do we need them?

7. Describe the general process of data processing in compliance with the basic scheme of the computer.

10. Talking points and discussion.

1. Speak about different types of events.

2. What events are called certain and what are impossible? Ground up your opinion.

3. Speak about the difference between data and information.

4. Express your point of view about the necessity to do counting every day and in all spheres of activity.

11. What do you think, how modern people react the fact that it is impossible to live without computers today and find many delights in the virtual world thanks to them.

ROLE PLAY

THE ROLE OF COMPUTER TECHNOLOGIES NOWADAYS

Situation: A group of students discuss what is better at school nowadays – to acquaint children with the world of books, to develop their habits of live communication, to inculcate love for reading or to use Internet and, of course, to write so-called electronic tests and to do homework using computer.

The main characters of the discussion are:

Opponents – is a group of participants, insisting on one or another point of view; **observers** – is a tutor with **a few assistants.**

Three groups of participants prove the correctness of the opposite point of view.

The first group proves that it's excellent to use live communication because

- It helps children to develop habits and skills while communicating with each other.

- Normal live communication and reading helps to develop so-called logical thinking.

- Normal live communication helps children to live in real not virtual world.

The second group proves that modern technologies are more suitable today because

- Modern technologies can help to express everything no worse than live communication and, of course, spare time.

- It's possible to find out practically everything while using computer technologies.

- On-line communication doesn't enforce us to feel awkwardness because it is more anonymous.

The third group proves that all in good measure because

- Any computer technology can't substitute live communication but sometimes it isn't bad to sit in electronic post and to relax in such a way.

- Live conversations are excellent but sometimes practically everybody wants to be anonymous.

- Live communication helps to see the world in new colours but listening to the music or watching films in the computer helps to distract from all problems.

QUESTIONS FOR DISCUSSION.

1. Technical aids and their advantages and disadvantages at school today.
2. Any computer technology will not be able to help set normal friendly relations between children and teachers.

3. Live communication makes our life more colourful, more interesting and overfills it with different positive moments events.

4. Modern technologies and their negative influence on children nowadays – children spend too much time by the computer and live in so-called virtual world

5. Computer technologies can oust live communication.

GRAMMAR ASSIGNMENTS

12. Tenses

Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. Yesterday, the system crashes due to an unexpected input.
2. I have develop this algorithm for my thesis project.
3. While we were debugging, the server was crashed.

13. Tenses

Insert the correct form of the verb

Task: Use the verbs in brackets in the correct form.

1. When the code (run), it (produce) an error.
2. By the time the professor (arrive), we (already/test) the module.
3. If you (use) recursion here, the program (become) slower.

14. Conditionals.

Types of conditional sentences

Task: Determine the type of conditional sentence (0, 1, 2, 3) and correct errors, if any.

1. If you **typed** the command correctly, it **works**.
2. If we had used a hash map, the lookup **is** faster.
3. If the server crashes, we **will lose** data.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. The developer implemented a new search algorithm.

2. Hackers attacked the system last night.

3. We are testing the software module now.

16. Modal verbs.

Choose the correct modal verb

Task: Insert the appropriate modal verb (can, should, must, might, have to, etc.).

1. You ___ refactor this code — it's too messy.

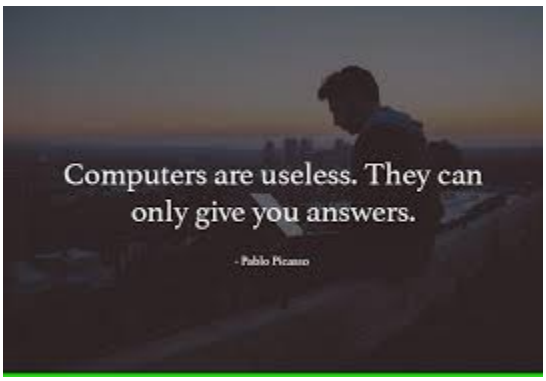
2. This function ___ return null if the input is invalid.

3. The application ___ be compiled before running.

UNIT III

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Computers are useless. They can only give answers». ***Pablo Picasso***



2. Discuss the following questions.

- Will computers ever think like humans?
- Why can't computers think like humans?
- How often should you take a break from the computer?
- What is digitalization in simple terms??
- What technologies can be considered digital?
- What technologies are not digital?
- Who created digital technology?
- Where is digitalization being applied right now?
- What equipment is related to digital technologies?
- What threats does digitalization pose?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

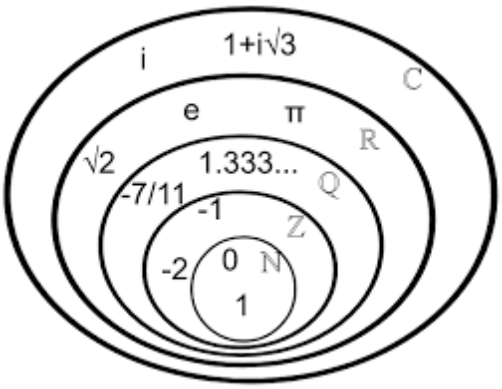
Amount
Base
Broken number
Code
Decimal numeration
Designate
Designation
Fraction

Identify
Index
Negative
Nonnegative
Notation
Numeration
Power
Scale
Scale of notation\Short ten
Transfer
Unity
Vice versa
Vulgar fraction
Whole number
Whole ten

4. Do some of these case studies and write them, using words (but not symbols)

$2^{3+}3^3$	$10^{15} - 5$	$90 - 3^3$	$2^4 + 3^2 - 5$	$14 \cdot 91$
$4^{5+}9^8$	$15 - 7 \cdot 2^{15}$	156^9	$15 \cdot 2^3$	$24 - 31 + 5$
$56 - 3^{10}$	$3 + 37 - 2^2$	$13^{12} - 100$	$100 - 7 + 3^5$	$135 + 71$

5. Read, translate and comment on the meaning of the statement.



Mankind is about to transfer all they have into digits and numbers. This is happening because the language of ciphers is more comprehensible for computers and machines that surround us. This on one hand makes our lives easier but on the other hand it deprives us of our individualities. At this point there arises a question: «Does easier mean better?» The answer is not always affirmative.

6. Complete the sentences with the words given below.

machine *e-mail* *Internet* *to print*
cellular phone *scanner* *equipment* *basic*

1. A computer is a _____ that helps people count, communicate and entertain.
2. John sent an _____ to his friend to Canada.
3. _____ is when one number is taken away from another.
4. I _____ all the photographs that I took during my vacation in London.
5. Stephen said he had never used _____ before so I had to help him send an e-mail.
6. One cannot use_____ cellular phone onboard an airplane because it may cause trouble to the plane's _____.
7. Sarah didn't know how to use her _____, so she phoned to the service centre.
8. At least _____ computer skills are obligatory if you want to get a decent job.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of each gear described in the text.

SCALES OF NOTATION

Scale of notation is a system of number designation by means of a certain set of ciphers.

In the usual number designation – decimal numeration – 10 ciphers are used: 0,1,2,3,4,5,6,7,8 and 9.

Every nonnegative whole number is represented with powers of 10 (1 is zero power of 10, 10 is the first power of 10, 100 is the second power of ten, 1000 is the third power of ten, 10000 is the fourth power of ten...). 10 is the base of decimal numeration.

If a number is less than 10, a corresponding to it single cipher is designated.

If a number is more than 10 or equal to it, but less than 100, it shall be represented by two ciphers: the first shows an amount of whole tens, the other – the amount of unities in the short ten.

E. g. $87 = 80 + 7 = 8 * 10 + 7 = 8 * 101 + 7 * 10° = 8710$.

The index mark at the bottom of the number identifies the scale of notation designating the initial number.

For designating a number of this scale of notation representation of this number with help of the powers of 2 is used.

A binary code of a number is its representation in the binary notation. Any computer is able to easily transfer a decimal number into its binary code and vice versa.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Scale of notation is a system of number designation by means of a certain set of ciphers.

2. In the usual number designation – decimal numeration – 20 ciphers are used.

3. Every nonnegative whole number is represented with powers of 10.

4. 10 is the base of decimal numeration.

5. If a number is less than 20, a corresponding to it single cipher is designated.

6. If a number is more than 10 or equal to it, but less than 100, it shall be represented by two ciphers: the first shows an amount of whole tens, the other – the amount of unities in the short ten.

7. The index mark at the bottom of the number identifies the scale of notation designating the initial number.

8. For designating a number of this scale of notation representation of this number with help of the powers of 4 is used.

9. A binary code of a number is its representation in the binary notation.

10. No computer can easily convert a decimal number to binary and vice versa.

9. Answer the following questions and retell the text.

1. What is scale of notation?
2. What is decimal numeration?
3. How is every nonnegative number represented with powers of 10?
4. What is the function of the index at the bottom of a number?
5. Describe the features of the binary code of a number.

10. Talking points and discussion.

1. What disciplines are digital technologies related to?

2. What do digital technologies give to a teacher (lecturer)? Ground up your opinion.

3. Make a list of qualities that a digital technology specialist should have.

4. Make a list of pros and cons of digital technologies for older generation.

11. Prepare a short presentation about your attitude towards digits and numbers in contemporary life and their powerful impact on human psychology. Use the following introductory words and phrases to sound logical and clear.

1. I think/In my opinion/From my point of view/From my perspective
2. First of all, …because…
3. Another/One more reason is …
4. For example/For instance …
5. Finally, I should say that …

GRAMMAR ASSIGNMENTS

12. Infinitives and Gerund

Choose the correct form of the verb.

Task: Insert the appropriate form of the verb:

1. We decided (use) an open-source library.
2. Debugging means (find) and (fix) errors.
3. The professor suggested (to rewrite) the function.

13. Articles

Choose the appropriate article

Task: Insert articles, if necessary

1. I created … API to communicate with the database.
2. … software engineer must understand algorithms.
3. Do you have … GitHub account?

14. Tense Practice

Definition of Tenses

Task: Distribute the sentences according to tenses and correct where

necessary.

Choose the correct verb form:

1. Yesterday, our team **develops** a new encryption algorithm.
2. The server **crashed** while we were running the load test.
3. By 2025, the system **will have processed** over a billion queries.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. The developers implemented a new neural network model.
2. The system stores user data on a secure cloud server.
3. They developed a new computer program to check the data.

16. Sequence of Tenses

Determine the time and correct errors

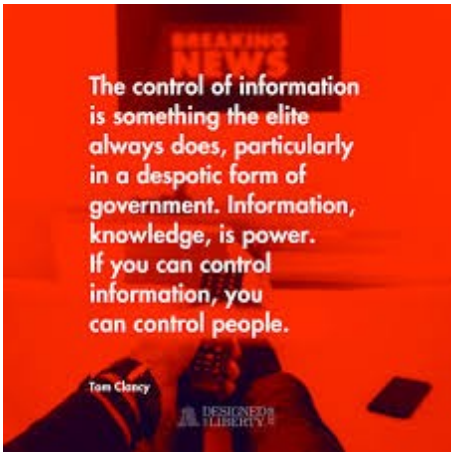
Task: Find and correct the grammatical errors in the following sentences:

1. The paper **explains** how the algorithm **was improving** classification accuracy.
2. We **observed** that the system **is failing** under high load.
3. The paper **shows** how new software testing methods **are used** in the field of computer technology.

UNIT IV

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «The control of information is something the elite always does, particularly in a despotic form of government. Information, knowledge, is power. If you control information, you can control people». ***Tom Clancy***



2. Discuss the following questions.

- What is information for a person?
- Why does a person need information?
- Where is the information used?
- Where is the information stored?
- What is innovation?
- What other word can you call «innovative»?
- What is an innovative person?
- What innovations will be in the future?
- What new technologies have emerged in the last 10 years?
- What technologies will be trending in 2025?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Bite
Consider
CPU
Gigabyte
Information input
Kilobyte
Means
Measure
Measurement
Megabyte
Operation
Output data
Perform
Prefix
Scheme
Sequence
T-byte
Understandable

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) scheme	a) to keep, to retain, to hold
2) to consider	b) to elaborate
3) to measure	c) comprehensible
4) measurement	d) to implement, to carry out
5) to develop	e) scaling
6) means	f) series, line
7) to perform	g) to suppose, to discuss, to ponder
8) to store	h) to scale
9) understandable	i) way, method
10) sequence	J) draft, project

5. Read, translate and comment on the meaning of the statement.

Last week I visited a technical exhibition devoted to different innovations in science. There were represented a lot of different exhibits there. At the end everybody had an opportunity to attend a lecture on contemporary ways of storing and operating information. I got to know about a plenty of interesting things that were new to me.

For example, I haven't ever had the slightest idea that information is also measured like time, distance, size etc. I learnt what capability modem sources of information possess. What way it is stored and so on. After the exhibition I was happy and tired. Happy I was because I came to know about many new things which I hadn't known before but my head was a little overfilled with information so I went home and had a little rest. Later I decided not to stop at this point and continue developing my knowledge about information. That's why I am now studying this profession.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

6. Complete the sentences with the words given below.

to consider to measure operation to perform understandable means sequence scheme

1. Unfortunately, computer language is not always _____for beginners.
2. Software developers need _____ factors such as cybercrime and phishing.
3. These parts are designed_____ their main functions.
4. The data recovery _____ was completed successfully.
5. Modern _____ of communication and information comply with this requirement.
6. Almost all computer tasks can be performed using the same_____.
7. All documents form a single chronological _____.

8. The screen _____ 34 inches diagonally.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the main features of binary codes described in the text.

HOW INFORMATION IS MEASURED INSIDE A COMPUTER

It has become a tradition to consider a sequence of bits equal to eight. This sequence is called byte. It is possible to designate binary codes $2^8 = 256$ numbers from 0 to 255 with the help of one byte.

Bytes are united in a sequence length 1024 (=210). This sequence is called kilobyte (KB) and is also used to measure the amount of information. The prefix Kilo comes from Greek and means a thousand (Kilogram = 1000 grams, Kilometer = 1000 meters). The number that is a power of two the closest to a thousand is 1024. 1024 bytes make exactly a Kilobyte (KB).

1024 KB is a megabyte (MB), 1024 MB is a gigabyte (GB), and 1024 GB is terabyte (T-byte).

So, bit, byte, kilobyte, megabyte, gigabyte and T-byte are basic units of information.

Thus, with the help of binary codes, ciphers and their sequences - numbers become understandable for any computer. The process of the information transformation is represented in the following scheme: information – number – binary code.

If this scheme is read from the left to the right, it shows the means of information input. The transformation of input data into binary codes is done by means of data input devices. The same scheme, being read from the right to the left, presents a means of representation of the results of computer's work - output data. This process is done by data output devices.

Computer's memory contains information only in the form of binary codes (0 and 1), and CPU performs operations with data presented only this way.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. It has become a tradition to consider a sequence of bits equal to eight. This sequence is called byte.

2. Bytes are not united in a sequence length 1024 (=210). This sequence is called megabyte (MB) and isn't used to measure the amount of information.

3. The prefix Kilo comes from Latin and means a hundred.

4. Bit, byte, kilobyte, megabyte, gigabyte and T-byte are basic units of information.

5. The process of the information transformation is represented in the following scheme: information – numbers– binary codes.

6. If the scheme (information – numbers – binary codes) is read from the left to the right, it shows the means of information output.

7. The same scheme, being read from the right to the left, presents a means of representation of the results of computer's work – input data.

8. 1024 KB is a megabyte (MB), 1024 MB is a gigabyte (GB), and 1024 GB is terabyte (T-byte).

9. 1024 bytes make exactly a Kilobyte (KB).

10. Computer's memory contains information only in the form of binary codes (0 and 1), and CPU performs operations with data presented only this way.

9. Answer the following questions and retell the text.

1. What sequence is called byte?
2. What is Kilobyte?
3. What is the origin of the prefix «Kilo»?
4. What is1024 KB, 1024 MB and 1024 GB?
5. Characterize the features of the scheme «information – numbers – binary codes».

10. Talking points and discussion.

1. How to sum a binary code?
2. Name the aspects closely related to information codes.
3. What innovative exhibitions are often held in your city and what are they related to?
4. Discover the features of a multimedia exhibition.

11. Role situation.

Imagine that you have extensive experience in organizing multimedia exhibitions. You have been doing this for 10 years. You're well-qualified specialist in this field of activity. You often conduct an interview with job applicants. What qualities should an organizer of the innovation exhibition have (possess)? What are the main stages of preparing and implementing an exhibition that you would advise a novice specialist to pay attention to? Ground up your opinion.

GRAMMAR ASSIGNMENTS

12. Modals

Use of modal verbs in technical contexts

Task: Insert the appropriate form of the verb:

1. The AI system ___ (must / should / can) be trained on diverse datasets.
2. Users ___ (might / must / would) experience delays during peak hours.
3. Developers ___ (could / must / will) follow GDPR regulations.

13. Participles & Relative Clauses

Choose the appropriate construction, tense, voice

Task: translate the sentences with participles or subordinate clauses into Ukrainian.

1. The team developed an API **connecting (connects)** multiple services.
2. **Working on neural network optimization**, the students discovered a new approach to weight initialization.
3. The researchers implemented an algorithm **capable of detecting anomalies in real time.**

14. Grammar-based translation

Definition of tenses, voices and constructions

Task: translate the sentences with appropriate constructions into Ukrainian.

1. The system was designed to process large volumes of data.
2. If we had more time, we would have tested all modules.
3. I would like you to introduce me to the specifics of studying web design.

15. Conditionals

Types of conditional sentences

Task: Translate the sentences from English into Ukrainian.

1. If the device is not connected to the network, the system will not be able to update.
2. If the temperature sensor exceeds the set threshold, an automatic shutdown will occur.

3. If the user enters the wrong password three times in a row, access to the system will be locked.

16. Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. Якщо сервер не відповідає, програма перейде до резервного сервера.

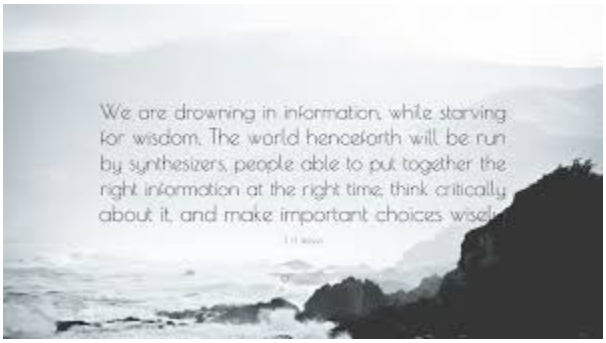
2. Якщо дані не будуть збережені, вони можуть бути втрачені під час збою живлення.

3. Якщо протокол передачі даних порушено, з'єднання буде розірвано.

UNIT V

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «We are drowning in information, while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely». ***E. O. Wilson***



2. Discuss the following questions.

- How to determine the reliability of information on the Internet?
- What is the sign of the reliability of information on the network?
- How to find reliable information?
- What sources of information can be considered reliable?
- Why is information from the Internet not always reliable?
- What is an effective way to search for information?
- Can a computer make mistakes? True or False?
- What are computer errors?
- What are the 5 disadvantages of computers?
- Do computers develop logical thinking? Ground up your opinion.

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Conjunction
Consist
Determine
Disjunction
Entire
Evaluate

Evaluation
False
Falsity
Fulfill
Generate
Involve
Lie
Message
Resultant
Rule
Sum
True
Unite
Verity
Whether

4. Pay attention to the given words and match them with their definitions. Make up your own situations with them.

1) consist	a) to make someone take part in something, especially by encouraging them to do this.
2) to involve	b) to make or produce something (by means of a natural or industrial process)
3) to determine	c) to carefully consider how useful or valuable an activity, plan or suggestion is, especially in order to decide whether or not to start or continue doing it
4) to evaluate	d) not real or true
5) generate	e) to contain a number of substances, materials or matters
6) false	f) to find out the exact details or facts about something, especially by using technical methods or equipment
7) verity	g) true fact or facts

5. Read, translate and comment on the meaning of the statement.

It is usually quite difficult to determine whether people tell the truth or lie. To find it out one should have good serendipity or in other words intuition. Psychologists give some reasonable advice how to detect if a person is lying or not. In this situation the so-called body language may be of use (you can figure out from a person's behaviour, look, gestures etc. what your interlocutor is trying to conceal).

For instance, if someone is lying, he or she will hardly look into your eyes. This person will try to escape from your look thus avoiding eye-contact. This should always be a signal that somebody is being dishonest with you.

It often happens that one lie generates another, so if you do not realize at once that your interlocutor is lying, there will be quite a big amount of other signals for you. Try to keep eye-contact as long as possible; this will help you prevent the person you are talking to from lying.

6. Complete the sentences with the words given below.

to consist *false* *falsity* *to generate*
to determine *message* *verity* *to involve*

1. The program is designed _____ reports automatically every day.
2. The _____ of some information in the database caused errors in the program's results.
3. Each _____sent between client and server is securely encrypted.
4. Unfortunately, the information turned out to be _____ and we couldn't refer to it in the process of working on our project.
5. The project _____ developing a scalable distributed system capable of processing large volumes of data in real-time.
6. Artificial intelligence _____ machine learning, natural language processing, and computer vision.
7. _____ of the data is always critical.
8. This special program helps _____ the best solution for the problem.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Speak about the role of logical operations in our life.

WHAT ARE LOGICAL OPERATIONS

You hardly know that there is one more type of operations with information which you use every day not even paying much attention to it.

It is an evaluation of information, whether it is true or false. For instance, you go out somewhere and tell your mom: «I'll go for a walk in the park or to the stadium». Saying that you mean you are going to visit at least one of two places – either the stadium or the park. And then you add: «On my way back I'll drop in at the library and at the bakery to buy some bread», meaning you are going to visit for sure both places. Think how you can evaluate your words, are they true or false (i.e. you've told the truth or a lie).

In both cases the information consisted of two parts. To combine messages, you have used conjunctions «OR» – in the first case and «AND» in the second. The conjunctions «AND» and «OR» performed a certain action (operation) over the two parts, generating new information – your message (like when you sum two numbers, you get a new number, equal to their sum).

OR operation (disjunction operation) makes the information true if at least one of the parts involved is fulfilled (you are not going to be a liar if you visit the stadium and don't have a walk in the park or vice versa).

The information made by the OR operation will, of course, be true if both its parts are true (you've told the truth only if you were both in the park and at the stadium).

There is only one case-when OR operation may be false. It happens when both parts are not fulfilled (you have told a lie only if you were neither in the park nor at the stadium).

AND operation (conjunction operation) is more exacting: to make the information produced by it true it is necessary that both parts involved in the operation should be fulfilled (you must visit both the baker's and the library).

If at least one of the parts involved is not true (i.e. it is false), the entire message becomes false (you have lied if you didn't drop in at the baker's or at the library). Therefore, your message will of course be false if both parts are not fulfilled. Thus, AND and OR operations are used to determine if the resultant information is true or false according to the data of verity or falsity of the parts involved in the operation.

The rules of the AND and OR operations are the following:

VERITY «AND» VERITY = VERITY VERITY «AND» FALSITY = FALSITY
FALSITY «AND» VERITY = FALSITY FALSITY «AND» FALSITY = FALSITY

VERITY «OR» VERITY = VERITY VERITY «OR» FALSITY = VERITY
FALSITY «OR» VERITY = VERITY FALSITY «OR» FALSITY = FALSITY

There is one more type of operations that transforms true information into false and on the contrary. This operation is called NOT. It is common knowledge that «not verity» is falsity and «not falsity» is verity.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. You hardly know that there is one more type of operations with information which you use every day not even paying much attention to it. It is an evaluation of information, whether it is true or false.

2. For instance, you go out somewhere and tell your mom: «I'll go for a walk in the park or to the stadium». Saying that you mean you are going to visit at least one of two places – either the stadium or the park. And then you add: «On my way back I'll drop in at the library and at the bakery to buy some bread», meaning you are going to visit for sure both places. Think how you can evaluate your words, are they true or false (i.e. you've told the truth or a lie).

3. In both cases the information consisted of two parts. The conjunctions «AND» and «OR» performed a certain action (operation) over the two parts, generating new information

4. OR operation (conjunction operation) is more exacting: to make the information produced by it true it is necessary that both parts involved in the operation should be fulfilled

5. AND operation (disjunction operation) makes the information true if at least one of the parts involved is fulfilled.

6. If at least one of the parts involved is not true (i.e. it is false), the entire message becomes false.

7. AND and OR operations are used to determine if the resultant information is true or false according to the data of verity or falsity of the parts involved in the operation.

8. The rules of the AND and OR operations are the following:

VERITY «AND» VERITY = VERITY VERITY «AND» FALSITY = FALSITY FALSITY «AND» VERITY = FALSITY FALSITY «AND» FALSITY = FALSITY

VERITY «OR» VERITY = VERITY VERITY «OR» FALSITY = VERITY FALSITY «OR» VERITY = VERITY FALSITY «OR» FALSITY = FALSITY

9. There are no more types of operations that transform true information into false and on the contrary.

10. The operation NOT implies that everything in our life is only the truth.

9. Answer the following questions and retell the text.

1. What is the name of the type of information that we use every day?
2. Give some examples of true and false information.
3. What conjunctions are used for combining messages?
4. Describe the main peculiarities of OR operation.
5. Describe the main peculiarities of AND operation.
6. What are the rules of both operations?
7. What information transforms true information into false and on the contrary?
8. Can such operations develop logical thinking? Ground up your opinion.

10. Talking points and discussion.

1. How to recognize a lie by non-verbal communication?
2. What gestures betray lies?
3. What gestures show self-confidence?
4. In what cases is it simply necessary to lie?

11. Prepare a short presentation about the role of logical operations in our life. Use the following introductory words and phrases to sound logical and clear.

1. Let me draw your attention to the issue of…/Let me introduce you to the issue of…
2. It's common knowledge that…/So far is known…
3. On the one hand… on the other hand…
4. In addition…/Moreover…/Furthermore…/Besides…/To add to this…
5. In conclusion…/To sum it up…/In a nutshell…/Summing it up…

GRAMMAR ASSIGNMENTS

12. Using the Passive Voice

Objective: An exercise in converting active sentences into passive ones, which is typical for scientific texts.

Find the errors in the use of the passive voice and correct them:

1. The code is wrote by a senior developer.
2. A new system will be install next week.
3. All passwords has been encrypted.

13. Grammatical tenses in academic writing

Objective: Correct use of tenses (especially Present Simple, Present Perfect, and Past Simple) in describing processes and research.

Choose the correct tense:

1. While the program ___ (to run), the CPU temperature rose significantly.
2. Usually, our scripts ___ (to execute) without errors.
3. I ___ (to debug) this issue since morning!

14. Subject-Verb Agreement

Objective: Practicing correct agreement, especially with IT terms (data, algorithm, system, etc.).

Choose the correct verb form:

1. The data from multiple sources ___ (shows / show) inconsistencies.
2. A group of algorithms ___ (is / are) tested under various conditions.
3. Each of the students ___ (has / have) completed the assignment.

15. Nominalization

Objective: Transform verbs into nouns for academic style.

Transform the sentences using nominalization:

1. They failed to meet the deadline.
2. We discussed the proposal yesterday.
3. The team developed a new strategy.

16. Using modal verbs in a technical context

Objective: Expressing possibility, necessity, recommendations.

Insert the appropriate modal verb: can, should, must, might.

1. All users _____ reset their password every 90 days.
2. The API _____ return an error if the input is invalid.
3. This function _____ be used for testing purposes only.

UNIT VI

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them». ***Steve Jobs***

2. Discuss the following questions.

- What is multimedia in simple words?
- What is multimedia in a phone?
- What is multimedia for?
- Who invented multimedia?
- What are multimedia applications?
- What is the difference between MMS and SMS?
- What types of multimedia files are there?
- How does multimedia work?
- Who is a multimedia specialist?
- What is a multimedia system?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Mouse
Multimedia
Personal Computer
Powerful
Screen

Sound
Support
Tie
Train of thoughts

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) power	a) ultimately
2) primary	b) to maintain
3) to focus	c) to concentrate
4) train of thoughts	d) to connect
5) to support	e) often
6) to tie	f) to embed
7) to build in	g) indispensable
8) necessary	h) main
9) frequently	i) way of thinking, thought process
10) eventually	j) strength

5. Read and translate the text. Use the supplied dictionary as an additional add.

Keyboard is a data input peripheral device. It serves to type texts and fulfil control over a personal computer. It usually has a 104 or 105- key layout, containing Latin and national alphabets.

A usual keyboard consists of several blocks: functional buttons block, digital block, alphabet block, cursor and indicators. This division makes its use convenient and fast.

Latin alphabet is commonly located in the upper register, national - in lower. To switch from one register to another an alt-shift or etrl-shift combination is used.

Keyboards are divided into AT, PS/2 or USB connected. The last type of connection is the most convenient, as all modem PCs have several USB ports, you won't need to choose the right connector - you just plug it in and work!

But despite all that has been mentioned above keyboards are eventually losing their value. They are being replaced by touchscreens and voice recognition devices.

6. Describe the elements and features of a computer mouse.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of codes and ciphers.

MULTIMEDIA

Thanks to the progress in technical development, personal computers (PCs) are getting more powerful. Most of them have begun to support live sound and are

now able to read CDs. The chips used in them allowed a user to work fast with any program. This is how MULTIMEDIA appeared.

The word multimedia is used frequently nowadays. Primarily this means the usage of more than one data processing device. A most primitive case is when a picture is shown in a book page, a more complicated – digitally represented audio and video information and text. The second meaning is much more usual for the word multimedia. Availability of such kind data mediums in home computers opens the door to the world of entertainment and education.

Interactive multimedia devices let users control the way of data representation. Thus, they can advance in the search for the necessary information their own way. A well-designed multimedia package interconnects the related information. In most of the packages these connections are accentuated with color-marked key words, or there is a button built in on the screen that it is enough to be mouse-clicked for getting out the related information. These ties (connections) are called hyperlinks. They are the most helpful in educational or reference editions, as they let the user follow his or her own train of thought.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Thanks to the progress in technical development, personal computers (PCs) are getting more powerful.

2. Most of them have begun to support live sound and are now able to read CDs.

3. The chips used in PCs allowed a user to work fast with any program.

4. The word multimedia isn't used frequently nowadays.

5. Primarily this means the usage of more than one data processing device.

6. A most complicated case is when a picture is shown in a book page, a more primitive – digitally represented audio and video information and text.

7. Interactive multimedia devices don't let users control the way of data representation and they can't advance in the search for the necessary information their own way.

8. A well-designed multimedia package interconnects the related information.

9. In most of the packages these connections aren't accentuated with color-marked key words, and there is no button built in on the screen.

10. Hyperlinks are the most helpful in educational or reference editions, as they let the user follow his or her own train of thought.

9. Answer the following questions and retell the text.

1.How did multimedia appear?

2. What does the term «multimedia» mean?

3. Describe the main functions of interactive multimedia devices.

4. What ties are called hyperlinks?

5. Where and why are hyperlinks most useful?

10. Talking points and discussion.

1. What is the difference between an Internet hyperlink and a document hyperlink? Name three examples of hyperlinks.

2. What color are hyperlinks?

3. Describe the pros and cons of hyperlinks.

4. Describe the main purpose of a hyperlink.

11. What do you think, how modern people react the fact that it is impossible to live without multimedia today.

ROLE PLAY

THE MAIN ADVANTAGES AND DISADVANTAGES OF MULTIMEDIA IN DIFFERENT SPHERES OF OUR LIFE

Situation: A group of students discuss that today it is impossible to live without modern digital technologies, which make it possible to combine the achievements of audiovisual technology (texts, sounds, video images, graphics, etc.) and provide interactive interaction between the user and the computer.

The main characters of the discussion are:

Opponents – is a group of participants, insisting on one or another point of view; **observers** – is a tutor with **a few assistants.**

Three groups of participants prove the correctness of the opposite point of view.

The first group proves that it's excellent to use multimedia in our life because

- Multimedia uses different channels (vision, hearing, text, graphics, animation), which allows for better assimilation of information and makes learning more interesting.

- Interactive and visually appealing multimedia materials can make learning more engaging and help you remember information better.

- Multimedia provides the opportunity to choose between different forms of information delivery, which allows meeting the needs of different students.

- Using multimedia in teaching can help develop creativity and imagination.

The second group proves that modern life is too overloaded with gadgets and people forget that they can communicate normally in person.

- A large amount of information and constant use of multimedia can lead to fatigue and decreased concentration.

- Too much multimedia can distract from the main content and lead to the loss of important information.

- Excessive use of social media can wear down one's ability to focus.

- Long-term use of multimedia devices can have a negative impact on vision and overall health.

The third group proves that it's a rhetorical question and everything is good in moderation because

- Sometimes people just want to escape from the difficulties of life.

- Live communication is good, but sometimes any person has a need to be anonymous.

- Multimedia learning allows students to access learning materials on mobile devices at their convenience, regardless of location or time.

- The concept of «anytime, anywhere» learning, making education more accessible and adaptable to individual schedules and preferences.

QUESTIONS FOR DISCUSSION.

1. What is the advantage of multimedia in entertainment?
2. What is multimedia in the 21st century?
3. What is the most important multimedia?
4. How does multimedia impact education, entertainment and communication?
5. How important are multimedia and ICT?

GRAMMAR ASSIGNMENTS

12. Tenses

Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. When I was writing the code, I have noticed a critical memory leak.
2. Our team develops a new compiler optimization since January.
3. The system crashed while it was processing a real-time video stream.

13. Tenses

Insert the correct form of the verb

Task: Use the verbs in brackets in the correct form.

1. Our lab _____ (develop) a machine learning model for detecting code plagiarism since last semester.
2. The system _____ (crash) while we _____ (install) the new driver.
3. So far, the algorithm _____ (perform) well on both training and validation sets.

14. Conditionals.

Types of conditional sentences

Task: Determine the type of conditional sentence (0, 1, 2, 3) and correct errors, if any.

1. If I **knew** Python last year, I **had contributed** to the AI module.
2. If we **had tested** the module thoroughly, it **wouldn't be crashing now**.
3. If I **were** the system administrator, I **would update** the firewall rules.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. They will finish the project next week.
2. Someone has broken my computer mouse.
3. The company will announce the results tomorrow.

16. Modal verbs.

Choose the correct modal verb

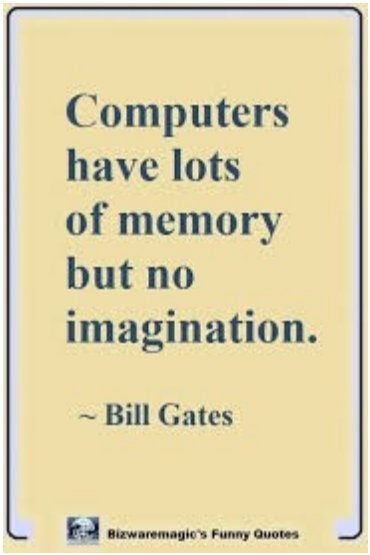
Task: Insert the appropriate modal verb (can, should, must, might, have to, etc.).

1. The software developer ___ fix the bug by tomorrow if he works overtime.
2. The user interface ___ be more intuitive to enhance user experience.
3. You ___ have received an email about the server maintenance yesterday.

UNIT VII

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Computers have lots of memory but no imagination». ***Bill Gates***



2. Discuss the following questions.

- How do people listen to music today?
- How to listen to music without carrying your phone?
- What do you call a person who listens to any music?
- What free Spotify analogue is there in Ukraine?
- What device do you use to store your music?
- Where is music stored on the phone?
- Where is the best place to download music to a flash drive?
- What is the difference between CD-ROM and CD-R discs?
- What are the disadvantages of streaming music? What happens if you listen to music every day?
- What happens if you listen to music every day?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Cellular phone
Counting functions
Data carrier

Decade
Entertaining center
Imagine
Influence
Magnetic rays
Modem
Play computer games
Pocket PC
Scratch
Simultaneously
Stable
Wide range

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) power	a) ultimately
2) primary	b) to maintain
3) to focus	c) to concentrate
4) train of thoughts	d) to connect
5) to support	e) often
6) to tie	f) to embed
7) to build in	g) indispensable
8) necessary	h) main
9) frequently	i) way of thinking, thought process
10) eventually	j) strength

5. Read, translate and comment on the meaning of the statement.

Most young people love music. You can often see a youth going with headphones in his or her ears dancing on his or her way. The time of bulky portable radio sets and cassette recorders or Walkman players is gone. The young people of

today prefer to use CD-ROM based Walkman players and MP3 flash-memory players. This is much more convenient and the quality of sound is extremely different from what you can expect of the outdated playback devices. Modem sound systems present a very good stereo sound. Moreover, contemporary cell phones have built-in MP3 players and their memory allows storing quite a large number of sound-tracks. So, you don't even need to carry a one more device.

6. Complete the sentences with the words given below.

to press play *CD-ROM* *microphone*
reflection *headphones* *decade*

1. A compact disk is _____.
2. When you want to listen to the music you insert a CD and _____.
3. When you want to listen to the music and do not want to disturb anyone you use _____.
4. Any singer uses a _____ to sound loud.
5. If you look in the mirror you will see your _____.
6. 10 years is a_____.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of CD-ROM.

CD-ROM

CD-ROM is apparently the most familiar information storage facility. CD-ROM means Compact Disk – Read Only Memory. CDs are widely spread, as they can contain up 800 megabytes of multimedia programs, that is approximately equal to 556 3,5 «floppy disks (diskettes)»!

CD-ROM resembles much audio CDs. Actually, the majority of CD-ROM drives can play audio CDs, however there hasn't been back compatibility so far, although it may now be available. Compact disks are usually made of polycarbonate, with aluminum alloy spread upon its surface, which is covered with plastic to protect a CD from dust and fingerprints. The information is stored by being represented as a number of tiny pits. A low-power laser ray is used to read a compact disk in the CD- ROM drive. Availability of pits in the aluminum layer is detected by laser reflection: a faint reflection or its complete absence shows that there is a pit in this place, an intense reflection – that there is none. The drive «sends» to the computer the following sequence: «pit – no pit» and the latter interprets it as a binary code. Then the binary code is transformed into a text, sound, cartoon or video.

The time, that computer needs to find the information, is called access time. It is usually measured in milliseconds. The shorter access time is, the faster computer reacts to your commands. Information can be read as soon as the laser is positioned over the required part of the disk. The speed at which the information is sent to computer is called data rate. It is measured with the amount of information that computer can read per second.

Multimedia computer systems are usually supplied with a CD-ROM drive, stereo playback system with speakers and a sound card. Sound card is set on the main board. It analyses the contents of sound files and plays them back through the speakers or headphones. It is sound card that will also record sound from a microphone or any other signal source. After that computer translates acoustic waves into digits, in other words into binary code, which it is able to read. Then the code is stored in the computer's memory.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. CD-ROM resembles much audio CDs. Actually, the majority of CD-ROM drives can play audio CDs.
2. Compact disks are usually made of steel, with copper alloy.
3. The information is stored by being represented as a number of tiny pits.
4. A low-power laser ray is used to read a compact disk in the CD- ROM drive.
5. Availability of pits in the aluminum layer is detected by laser reflection: a faint reflection or its complete absence shows that there is no pit, an intense reflection shows that there is a pit in this place.
6. The drive «sends» to the computer the following sequence: «pit – no pit» and the latter interprets it as a binary code. Then the binary code is transformed into a text, sound, cartoon or video.
7. Access time is usually measured in millimeters. The longer access time is, the slower computer reacts to your commands.
8. Information can be read as soon as the laser is positioned over the required part of the disk.
9. Multimedia computer systems are usually supplied with a CD-ROM drive, stereo playback system with speakers and a sound card.

10. After the sound card records sound from a microphone or any other signal source, the computer translates the acoustic waves into digits, that is, into binary code, which it can read. Then the code is stored in the computer's memory.

9. Answer the following questions and retell the text.

1. What does CD-ROM mean?
2. What are Compact Discs usually made of?
3. Describe the CD's performance structure.
4. Describe the access time function.
5. How are multimedia computer systems usually supplied?
6. Describe the features of the sound card.

10. Talking points and discussion.

1. What kind of music has a negative impact on the psyche?
2. What is bad sounding music called? Ground up your opinion.
3. How did people listen to music in ancient times?
4. What do you call people who listen to old music?

11. Prepare a short presentation about the modern opportunities of listening to your favourite music. Use the following introductory words and phrases to sound logical and clear.

1. I think/In my opinion/From my point of view/From my perspective
2. First of all, …because…
3. Another/One more reason is …
4. For example/For instance …
5. Finally, I should say that …

GRAMMAR ASSIGNMENTS

12. Infinitives and Gerund

Choose the correct form of the verb.

Task: Insert the appropriate form of the verb:

1. The professor encouraged us ___ (submit) our research early.
2. I'm planning ___ (develop) a machine learning model for my thesis.
3. He avoided ___ (use) global variables in his code.

13. Articles

Choose the appropriate article

Task: Insert articles, if necessary

1. He wrote … script to automate the backup process.

2. … Internet has revolutionized … way we access information.

3. The professor introduced … concept of … finite automaton.

14. Tense Practice

Definition of Tenses

Task: Distribute the sentences according to tenses and correct where necessary.

Choose the correct verb form:

1. The program **runned** without any errors yesterday.

2. She **is working** on the algorithm since morning.

3. If I **will find** the bug, I will fix it.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. The system processes user requests in real time.

2. Researchers developed a new algorithm for data clustering.

3. The team will deploy the application next week.

16. Sequence of Tenses

Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. The algorithm described in this paper (to improve) the performance of neural networks significantly compared to previous methods.

2. When the system (to receive) new input data, it immediately (to update) the model parameters.

3. Researchers (to develop) various approaches to optimize deep learning architectures over the last decade.

UNIT VIII

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Man is still the most extraordinary computer of all». ***John F Kennedy***

2. Discuss the following questions.

- What are audio files?
- How to send audio files?
- Who is smarter – the human brain or the computer?
- What was the first computer?
- When did you first start using a computer?
- Does having a computer make life more complicated or less complicated?
- What factors can help you understand that it is difficult for you to exist without a computer?
- How many people in the world have a computer?
- What could the computers of the future be like?
- Do you agree that computer can make our life more diverse and happier?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Cochlea
Create
Exist
Frequency
Image
Improve
Preserve
Suchlike
Variable
Wave

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) sound	a) to alter
2) oscillation	b) identic (-al)
3) to edit	c) to revive
4) equal to	d) to modify
5) to render	e) alternating
6) to restore	f) proper
7) variable	g) to play back
8) decent	h) vibration
9) to change	i) to accommodate
10)to contain	j) audio

5. Read the text and correct the mistakes.

Today is usual day of mine. The sky blue, the Sun are shining. My computer is as usual buzzed. The telephone rings at the moment and nobody isn't wanting to pick it up. My mother cook dinner on the kitchen. There is nothing decent on TV today. My friend Joe went on a tour to Thailand. He is going to be away for two weeks. My cell phone blocked because I didn't pay for it. My little brother is stuck again in the wardrobe, as he doesn't can to open the door from the inside. He is crying and shouting like an injured duck. There are only one question in my head: isn't I too optimistic!?

6. Complete the sentences with the words given below.

to render	*to register*	*equal*	*to preserve*
cochlea	*to perceive*	*image*	*to improve*

1. The algorithm terminates when the loss function becomes _____ to zero, indicating perfect reconstruction.

2. Cochlear implants convert digital signals into electrical impulses to stimulate the_____, enabling hearing.

3. Deep learning techniques are widely used for _____classification, segmentation, and enhancement.

4. Neural networks trained on visual data can _____ patterns in medical images that are invisible to the human eye.

5. The sensor data must be _____ with the 3D model to ensure accurate object tracking.

6. Lossless compression algorithms are used _____the original quality of audio and video data.

7. Modern GPUs are optimized _____complex 3D scenes in real time for virtual reality applications.

8. The primary goal of the proposed algorithm is _____ the efficiency and accuracy of real-time object detection in autonomous systems.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the main features of sound signals and possibilities of sound improvement thanks to special programs.

AUDIO IMAGES

Most sound cards can create and play back two different sound file types – wave (WAV) and not wave (MIDI). Sound is waves spreading in the air, which make human eardrums vibrate. In the cochlea, inside the ear labyrinth, those oscillations are transformed into signals. Our brain perceives these signals as sounds. The actual wave picture of the recorded sound is preserved in sound files, but the signals are transformed into comprehensible for computer binary code. First sound waves are changed by microphone into variable electric signals. These

signals are called analogue. After that the sound card registers the force of the signals several times per a definite period of time. The frequency of registration of these signals is called the frequency of sampling. In order to render the primary sounding, computer must have the frequency of discretization equal to several thousand times per second.

The frequency of discretization is measured in Kilohertz's. The lowest frequency of discretization used in soundcards is equal to 11 KHz, in other words, the card registers 11000 extracts per one second. With the increase of the frequency of discretization the quality of sound is getting better. Some sound blasters fulfill registration with 44 KHz frequency, but most of them present sound of decent quality with 22 KHz.

Contrarily, MIDI files store not the sound spectrum itself, but the commands for restoring primary sounds. Suchlike files can contain music only. MIDI means Musical Instrument Digital Interface these files keep information for music playback.

There exist special programs that allow a user to edit sound and improve its quality greatly.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Most sound cards can create and play back two different sound file types – wave (WAV) and not wave (MIDI).

2. Sound is waves spreading in the air, which make human eardrums vibrate.

3. In the cochlea, inside the ear labyrinth, those oscillations are not transformed into signals. Our brain doesn't perceive these signals as sounds.

4. First sound waves are changed by microphone into variable electric signals. These signals are called analogue.

5. The frequency of registration of these signals is called the frequency of sampling. In order to render the primary sounding, computer must have the frequency of discretization equal to several thousand times per second.

6. The frequency of discretization is measured in Kilowatts or Kilobytes.

7. The lowest frequency of discretization used in soundcards is equal to 11 KHz, in other words, the card registers 11000 extracts per one second.

8. MIDI files store the sound spectrum itself, but not the commands for restoring primary sounds.

9. MIDI means Musical Instrument Digital Interface these files keep information for music playback.

10. There exist special programs that allow a user to edit sound and improve its quality greatly.

9. Answer the following questions and retell the text.

1. What sound file types can sound cards create and play back?
2. What is sound?
3. What happens in the cochlea?
4. What signals are caked analogue?
5. What does sound card do?
6. Characterize such a phenomenon as the frequency of discretization.
7. Describe the main features of MIDI files.
8. What do special programs allow the user?

10. Talking points and discussion.

1. Computers are going to devastate the human race.
2. MS is a total failure.
3. Microsoft is a monopoly.
4. Computers give people a helping hand.

11. Work in pairs. Make up dialogues on these topics using the active vocabulary of the lesson (sampling, playback, I'm as busy as a bee, audio, wave, sorry but I can't, would you please, variable, preserve, smash, edit, cochlea, I'll call you back a bit later, monitor, my CD, your computer, tell me, stop doing that).

1. Express your opinion about the effect of sound waves on the human body.
2. What sounds are the most important to a person (for people).

GRAMMAR ASSIGNMENTS

12. Modals

Use of modal verbs in technical contexts

Task: Insert the appropriate form of the verb:

1. The AI model ___ be retrained periodically to maintain accuracy.
2. ___ we access the server remotely from this network?

3. Users ___ log in using multi-factor authentication.

13. Participles & Relative Clauses

Choose the appropriate construction, tense, voice

Task: translate the sentences with participles or subordinate clauses into Ukrainian.

1. The engineer designed a new compiler. It optimizes code at runtime.

2. The dataset contains millions of images. The images are labeled by hand.

3. The students are working on a robotics project. The project uses real-time sensor data.

14. Grammar-based translation

Definition of tenses, voices and constructions

Task: Combine the sentences using participles or subordinate clauses.

1. The system was designed to process large volumes of data.

2. If we had more time, we would have tested all modules.

3. I would like you to introduce me to the specifics of studying web design.

15. Conditionals

Types of conditional sentences

Task: Translate the sentences from English into Ukrainian.

1. If we had used version control, we wouldn't have lost the project files.

2. If they had patched the vulnerability in time, the system wouldn’t have been hacked.

3. If he had studied machine learning earlier, he would be working at Google now.

16. Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. Якби зловмисники мали доступ до приватного ключа, вони б розшифрували всі повідомлення.

2. Якщо буде знайдено вразливість, система сповістить адміністратора.

3. Якби база даних підтримувала горизонтальне масштабування, вона справлялася б з великою кількістю користувачів.

UNIT IX

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: « Color is often the most powerful tool in visual storytelling». ***John Maeda***

2. Discuss the following questions.

- Which occupations are related to the colour images on the screen?
- How many types of images are there in multimedia?
- What are jpeg, png and tiff?
- What does a graphic designer do in simple words?
- What are the niches in design?
- What determines the image quality on a computer screen?
- What are the benefits of using a monitor?
- What are the advantages of a curved screen?
- What makes color images on a screen different from printed color images?
- How do screen brightness and contrast affect the way we see colors?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Beam
Cathode-ray
Electrons
Folder
Frequency
Gun
Intensity
Pixel
Prohibited
Regeneration
Salvo

4. Pay attention to the given words and match them with their definitions. Make up your own situations with them.

a) scanner
b) monitor
c) slot
d) system block
e) keyboard
f) printer
g) head phones
h) computer mouse

1. A device that shows what operations are being done by the computer.
2. A gear that you move and click to give commands to your PC.
3. A board used for typing and inputting information into computer.
4. Something that you can insert a CD into.
5. A box that contains all the computer's components.
6. It is used to scan documents, pictures and photos.
7. Thanks to them a person can hear the sounds that a computer plays back.
8. A gear that allows you to print documents and images.

5. Read, translate and comment on the meaning of the statement.

Color effects play a critical role in computer graphics, significantly influencing user perception and experience. Through techniques such as color grading, blending, and shading, developers can enhance realism, convey mood, or guide user attention. For instance, warm tones are often used to evoke comfort, while cooler hues can suggest distance or calmness.

In real-time rendering, shaders manipulate color values at the pixel level, enabling dynamic lighting and surface effects. Additionally, color models like RGB, HSV, and CIELAB provide frameworks for precise color manipulation, essential for tasks such as image processing, computer vision, and user interface design.

Understanding color theory and its implementation through software libraries (e.g., OpenGL, DirectX, or WebGL) is fundamental for creating visually compelling and accessible digital environments.

6. Complete the sentences with the words given below.

folder	*screen*	*intensity*	*fishy*
salvo	*range*	*major*	*beam*

1. Replacement of this _____ is prohibited.
2. The gun gave a final _____.
3. There are a lot of cheap and low-quality films on the _____.
4. The _____ aim of our computer company is to develop new products and technologies, as well as improve customer experience.
5. The _____ intensity of the city traffic depends much upon the ways of its regulation.
6. The police are allowed to shoot at any stranger who looks _____.
7. There was presented a wide _____ of video games, digital devices, as well as innovative solutions in the field of artificial intelligence and virtual reality.
8. The movement of the electron _____can be controlled using magnetic or electric fields.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Speak about the role of images in our life.

VISUAL IMAGES

To completely enjoy multimedia, your PC must be able to display fine and colorful images. A monitor creates any color pictures making combinations of three major colors: red, green and blue. Three cathode-ray guns located in its back shoot at the screen with the finest beam of electrons. The image shown in the screen consists of thousands of dots, called pixels. Every pixel consists of a group of smaller dots that get red, green or blue color after they are rayed by the cathode-ray gun. Changing the intensity of rays a great color range is achieved. The larger amount of pixels is in the screen, the finer the picture is.

Every salvo of electrons exists for only few moments, so to keep the picture up, a constant replacement of electrons is necessary. This process is called regeneration. The speed which the monitor replaces horizontal and vertical lines with is measured by the frequency of regeneration. The replacement of vertical lines is more important. In most of the monitors it happens 76 times per second, so they have the frequency of regeneration 76 Hertz. Modem monitors are able to keep the image with the 100 Hz- frequency and more.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. To completely enjoy multimedia, your PC must be able to display fine and colorful images.
2. A monitor creates any color pictures making combinations of five major colors: red, green, blue, yellow and violet.
3. Three cathode-ray guns located in its back shoot at the screen with the finest beam of electrons.
4. Every pixel consists of a group of smaller dots that get red, green or blue color after they are rayed by the cathode-ray gun.
5. Every salvo of electrons exists for only few moments, so to keep the picture up, a constant replacement of electrons is necessary. This process is called regeneration.

6. The speed which the monitor replaces horizontal and vertical lines with is measured by the frequency of regeneration.

7. The replacement of horizontal lines is more important. In most of the monitors it happens 74 times per second, so they have the frequency of regeneration 74 Hertz.

8. Modem monitors are able to keep the image with the 100 Hz- frequency and more.

9. Answer the following questions and retell the text.

1. What must PC display to enjoy multimedia?
2. What is the main function of cathode-ray guns?
3. Describe the structure of pixels.
4. What process is called regeneration?
5. What is measured by the frequency of regeneration?
6. Why the replacement of vertical lines is more important?
7. What image are modern monitors able to keep?

10. Talking points and discussion.

1. What visual images in computer graphics are divided into?
2. Describe the operating principle and features of raster graphics
3. Describe the operating principle and features of vector graphics
4. Describe the general application of computer graphics.

11. Role situation.

Desktop Background Effect on People's Inner World

According to psychologists, wallpapers for a desktop background on a personal computer have a significant impact on a person's emotions, his ability to work and the speed of performing actions. Many modern people spend a full day in

front of a computer, or this is their favorite pastime. Such facts suggest a more careful approach to the choice of background, taking into account the following expert advice.

Imagine that, on the one hand, you are a qualified computer scientist and, on the other hand, you are a very good at psychology. Three friends want to choose a colour scheme for their desktop background. As for choice of wallpaper for a desktop background, opinions are divided. One friend thinks that it doesn't matter what colour scheme to choose. He is sure that even contrast black and white colours will not interfere with work if a person is perseverant and industrious by nature. He suggests that the same concerns aggressive and harsh colours. They won't distract a serious person from work and won't do any harm to his psychic.

The second friend is an easy-going person by nature and always tries to be an optimist. He believes that natural landscapes or seascapes and even still life, where blue, green and soft pink colors predominate will be more suitable for desktop publishing. The thing is they activate mental activity, have a beneficial effect on the state of the nervous system. By the way, a regular change of picture also has a positive effect on our mood and working capacity.

The third person is rather philosophical and thinks that an excess of lilac color in the image can cause drowsiness and even depression. Red, on the contrary, invigorates, but it's better not to abuse it. You can put wallpaper of this colour for one day, otherwise they begin to negatively affect the psyche and relationships with colleagues. Warm green, orange and yellow inspire optimism and cheer up. The beautiful background of the dark night sky, which many people like, is depressing and tiring, so it is better to refuse it. Besides, our subconscious likes smooth and rounded lines. Sharp corners can cause anxiety in our hearts and minds.

Questions for discussion

1. What colour scheme would you recommend the three friends to choose and why?
2. What colour is considered to be the colour of harmony and tranquility?

3. Do you agree that reserved and secretive persons like lilac, violet, dark-blue and even black colour?

4. Do you agree that ivory, pastel and beige colours don't not have a strong effect on our psyche?

5. How do screens create different colors?

6. Why are RGB (Red, Green, Blue) colors used in most digital screens?

7. What is the difference between RGB and CMYK color models?

GRAMMAR ASSIGNMENTS

12. Using the Passive Voice

Objective: Fill in the blanks with the correct form of the verb in the passive voice.

Insert the verb in brackets in the correct passive form. Consider the tense and context:

1. The datasets _____ (not clean) properly, which led to inaccurate results.

2. The code _____ (write) in Python and then _____ (convert) to C++.

3. The AI model _____ (train) using GPU acceleration.

13. Grammatical tenses in academic writing

Objective: Rewrite the passage in a scientific style using the passive voice.

Rewrite the following paragraph, replacing the active voice with the passive voice, so that it sounds more formal and scientific:

We analyzed the network performance using different parameters. Then, we adjusted the architecture to improve accuracy. Finally, we validated the model on three benchmark datasets.

14. Subject-Verb Agreement

Objective: Practicing correct agreement, especially with IT terms (data, algorithm, system, etc.).

Choose the correct verb form:

1. The data collected from multiple sources _____ (is/are) being analyzed using machine learning algorithms.

2. Neither the algorithm nor the data structures _____ (was/were) for real-time processing.

3. A set of advanced neural networks ___ (was/were) implemented in the final model.

15. Subject-Verb Agreement

Objective: Choose the correct form of the verb

Choose the correct form of the verb in brackets, agreeing it with the subject:

1. Python, along with other scripting languages, (play / plays) a key role in automation.

2. One of the virtual machines (crash / crashes) during the load test.

3. If the data (is / are) incorrect, the results will be misleading.

16. Use of complex subject in technical context

Objective: Transform the sentences using Complex Subject

Transform the sentences so that the subject becomes complex.

1. People say that the new compiler works faster.

2. Experts report that the vulnerability has been fixed.

3. It is believed that AI will change the job market.

UNIT X

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «The computer is not a substitute for the mind, but an extension of it». ***Stephen Hawking***

2. Discuss the following questions.

- What is desktop publishing?
- What kind of documents can be produced with a desktop publishing system?
- Page layout software is the key component of a desktop publishing system. Which file types can be imported into a page layout program?

- Why is PDF more suitable for printing?
- What are the main differences between Word and PDF?
- What is document layout?
- What is the difference between a brochure and a booklet?
- What is the difference between a brochure and a flyer?
- What types of brochures are there?
- What is the difference between a newsletter and a brochure?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Attached
Brochure
Chart
Composed
Font
Graph
Graphic design
Layout
Newsletter
Print
Solution

4. Pay attention to the given words and match them with their definitions. Make up your own situations with them.

1) to edit	a) business that offers specialized services, such as computing, printing, or financial processing, to other companies and organizations for a fee.
2)to publish	b) (of a computer or other device) produce, deliver, or supply (data).
3) kerning	c) prepare and issue (a book, journal, piece of music, etc.) for public sale, distribution, or readership.
4) PDF	d) prepare (written material) for publication by correcting, condensing, or otherwise modifying it.

5) DTP	e) to disperse through a space or over an area; spread; scatter.
6) output	f) the process of creating documents of typeset quality using equipment that can be placed on a desktop.
7) pre-press	g) the distance between any two objects in an arranged series.
8) spacing	h) a file format for capturing and sending electronic documents in exactly the intended format.
9) to distribute	i) the spacing between letters or characters in a piece of text to be printed.
10) service bureau	j) relating to composition, page layout, and other work done on a publication before it is actually printed.

5. Read, translate and comment on the meaning of the statement.

THE COMPUTER AS THE EXTENSION OF THE HUMAN MIND

Since its inception, the computer has become more than just a tool for calculations – it has evolved into a natural extension of the human mind. It enhances our cognitive abilities, enables us to process vast amounts of information, model complex systems, and find solutions beyond the reach of intuition.

Just as writing and paper became external memory for humanity, the computer has become an external organ of thought – adaptable, scalable, and capable of learning. Artificial intelligence, neural networks, and decision-making

algorithms are not merely technologies; they are reflections and extensions of human thinking in digital form.

In this way, the computer is not a replacement for the human, but a partner and an extension – one that amplifies the creative and analytical potential of modern society.

6. Complete the sentences with the words given below.

layout *to arrange* *scalable font* *to attach*
text flow *to manipulate* *adjustment* *service bureau*

1. We created a new _____ for the brochure using three columns and graphic elements.
2. You need to _____ the PDF file with the layout and fonts to the email for printing.
3. The software allows you _____objects on the page — change their size, shape, and position.
4. It is important _____text and images on the page properly for better readability.
5. Before printing, you need to make a small color _____ to make the image look correct.
6. If the text doesn't fit in one column, the _____continues automatically into the next one.
7. The layout uses a_____, which keeps its quality at any size.
8. You can send the file to a _____ to print it using professional equipment.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the main peculiarities of desktop publishing.

WHAT IS DESKTOP PUBLISHING

Desktop publishing (DTP) refers to the use of computers to design and publish books, brochures, newsletters, magazines and other printed pieces. DTP is really a combination of several different processes including word processing, graphic design, information design, output and pre-press technologies, and sometimes image manipulation. DTP centres around a page layout program. Typically, a layout program is used to import texts created in word processing programs; charts and graphs from spreadsheet programs; drawings and illustrations created in CAD, drawing or paint programs; and photographs. The program is then used to combine and arrange them all on a page. It is this ability to manipulate so

many different items and control how they are used that makes layout software so popular and useful. However, modern word processors also have publishing capabilities, meaning the line separating such programs from DTP software is becoming less clear. In general, though, powerful new publishing systems use high quality scalable fonts and give you control over typographic features such as kerning (adjusting the spaces between letters to achieve even, consistent spacing). Another key feature of DTP software is text flow – the ability to put text around graphic objects in a variety of ways. Once composed, DTP documents are printed on a laser printer or on a high-resolution imagesetter. For transfer to a commercial printer, the documents are generally saved in their native page layout format (such as Adobe InDesign or QuarkXPress) or as PDF files. PDF stands for Portable Document Format and allows people to view, search and print documents exactly as the publisher intended – you don't need to have the software and fonts used to create it. PDF files can be published and distributed anywhere: in print, attached to email, posted on websites, or on DVD. To open a PDF file, only the Adobe Acrobat Reader (a free download) is required. In modern commercial printing, DTP files are output directly to the printing plates without using film as an intermediate step. This new technology is known as Computer-To-Plate (CTP) or direct to plate, and the machine that generates plates for a printing press is called a plate setter. CTP machines are expensive, so most people take their files to a service bureau, a company that specializes in printing other people's files. Service bureaus offer a full range of scanning and printing solutions.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Desktop publishing (DTP) refers to the use of computers to

design and publish books, brochures, newsletters, magazines and other printed pieces.

2. DTP is really a combination of two process, including graphic design and image manipulation.

3. DTP centers around a page layout program. A layout program is used to import texts created in word processing programs; charts and graphs from spreadsheet programs; drawings and illustrations created in CAD, drawing or paint programs; and photographs.

4. The ability to manipulate so many different items and control how they are used that makes layout software so unpopular and useless.

5. Powerful new publishing systems use high quality scalable fonts and give you control over typographic features such as kerning (adjusting the spaces between letters to achieve even, consistent spacing).

6. Another key feature of DTP software is text flow – the ability to put text around graphic objects in a variety of ways.

7. Once composed, DTP documents are printed on inkjet or matrix printers.

8. For transfer to a commercial printer, the documents are generally saved in their native page layout format (such as Adobe InDesign or QuarkXPress) or as PDF files.

9. PDF stands for Portable Document Format and allows people to view, search and print documents exactly as the publisher intended.

10. CTP machines are not very expensive, they belong to the category prize and quality, so most people prefer not to take their files to a service bureau.

9. Answer the following questions and retell the text.

1. What type of software is used for the creation of DTP documents?
2. What is a PDF and what can it do?
3. Which program do you need to view a PDF document?
4. What are three differences between DTP software and word processors?
5. Why do people send their DTP files to service bureau?
6. What types of printers are there?
7. What is better inkjet or laser printer for home?
8. What are the disadvantages of a laser printer?

10. Talking points and discussion.

1. What program should I use to layout books?
2. What program should I use to layout a catalog?
3. Describe the advantages of color and black and white layout.
4. Describe the disadvantages of color and black and white layout.

11. What do you think, how modern people react to different specific moments in traditional and e-publishing of books, magazines etc.

ROLE PLAY

THE CURRENT PROBLEM OF INTERACTION BETWEEN PRINTED AND ELECTRONIC FORMS OF READING MATERIALS IN MODERN LIFE.

Situation: Modern information technologies have a decisive impact that occur in the social structure of society, culture, economy, politics etc. The specificity of the current situation is such that under the influence of information technologies there are rapid changes in all areas of activity. Today they are really quickly implemented. The preservation of smth well-known, old, long-existing is a special and interesting phenomenon in the age of advanced technologies. One example is the printed version.

The main characters of the discussion are:

Opponents – is a group of participants, insisting on one or another point of view;

observers – is a tutor with **a few assistants.**

Three groups of participants prove the correctness of the opposite point of view.

The first group proves that traditional publishing should prevail over e-publishing because

- People of old generation like smell of books, the crunch of pages and the tactile sensations.

- Printed version helps relax from TV-screen and thereby preserves our sight.

- You can make your own library.

- E-publishing does not bring pleasure and it's difficult to perceive information.

- Problems with eyesight can become a very significant problem for our health.

The second group proves that on the contrary, e-publishing should prevail over traditional one because

- Nowadays one can read e-publishing everywhere (in the street, in the cafe, in transport).

- There is no need to spend too much money (traditional printed editions are often very expensive nowadays) and not all people can't allow to spend a lot of money on them.

- Sometimes a book can have an unpleasant and even a disgusting smell (unfortunately, the paper absorbs all smells very quickly).

- If the book is very big (especially it concerns encyclopedias) it's hard to turn over the pages and it is also inconvenient to take a book on a trip.

- And, finally, books litter the apartment and take up too much space.

The third group proves that this is a pretty rhetorical question and it depends upon a particular person's preferences because

- If a certain category of people really likes print publications they can go to the library and take there the edition they like so much.
- It’s also possible to rent a book in certain places.
- Some people enjoy traditional publishing and e-publishing at the same time.
- Sometimes people can find rare editions on the book markets and make a wonderful gift to Book Lover.
- One can also donate books for charity and thereby, they won't litter the house.

QUESTIONS FOR DISCUSSION.

1. What is your attitude towards audiobooks?

2. What format is more reliable for saving the documents? PDF or Word? Explain why?

3. Do you agree that e-publishing can successfully oust traditional publishing at present? Express your opinion.

4. Can it be clear at first sight that the material is worth its reviewing and reading irrespective of its version (print or online)?

5. Do you agree that the choice of traditional publishing or e-publishing

depends upon the reader's psychology?

GRAMMAR ASSIGNMENTS

12. The Sequence of Tenses

Translate from English into Ukrainian

Task: Translate the sentences to English into Ukrainian and explain the use of appropriate tenses:

1. He said that the algorithm had already been optimized before the final test.

2. The engineer explained that they were debugging the code when the server crashed.

3. She mentioned that the application would require more memory to run smoothly.

13. The Sequence of Tenses

Insert the correct form of the verb

Task: Use the verbs in brackets in the correct form.

1. The professor said that the system (to crash) because of a memory leak.

2. She told us that the developers (to work) on the new interface for several weeks.

3. He mentioned that the database (to not respond) when they tried to query it.

14. I wish

Types of conditional sentences

Task: Translate the sentences from English into Ukrainian and explain the use of appropriate tenses.

1. I wish I had learned Python earlier.

2. I wish our code didn't have so many bugs.

3. I wish the server would stop crashing during deployment.

15. Complex Subject

Find and correct errors

Task: Find errors in the use of Complex Subject and correct them:

1. This library is say to increase performance.

2. The system seems be unstable under heavy load.

3. It reports that the server is down.

16. Complex Subject

Translate from Ukrainian into English

Task: Translate the sentences from Ukrainian into English using Complex Subject

1. Вважається, що ця нейромережа розпізнає мову з високою точністю.

2. Передбачається, що нове програмне забезпечення зменшить витрати

на обслуговування.

3. Очікується, що систему обробки даних буде оновлено наступного року.

UNIT XI

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Cybersecurity is much more than an IT topic. It is a fundamental issue of national security, economic stability, and individual privacy». ***Klaus Schwab, Founder and Executive Chairman of the World Economic Forum***

2. Discuss the following questions.

- What is data cybersecurity?
- What is the difference between cybersecurity and data security?
- Which country has the best cybersecurity?

- What is the position of Ukraine on cybersecurity?
- What are the types of data security?
- What are 90% of cyberattacks?
- What programs do you need to know for cybersecurity?
- What are the 5 security functions?
- What is the weakest link in information security?
- What types of cyber threats are there?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Access
Artificial intelligence
To bypass
Cloud system
Cryptography
Cyberattack
Cybersecurity
Challenge
Ethical hacking
Identity
Phishing
To protect
Security system
Solution
Threat
Vulnerability

4. Pay attention to the given words and match them with their defintions. Make up your own situations with them.

1) cyberbullying	a) protecting yourself from online harms and risks by using digital technologies responsibly and securely
2) to verify	b) online threats and mean, aggressive, or rude texts, tweets, posts and messages
3) suspicious	c) a secret word or phrase that must be used to gain admission to a place.
4) to share	d) text, images, or videos that causes distress, emotional harm, or psychological damage

to a person or group

5) to protect — e) able to be reached or entered

6) password — f) exposed to the possibility of being attacked or harmed, either physically or emotionally.

7) digital safety — g) to keep someone or something safe from injury, damage, or loss

8) accessible — h) have a portion of (something) with another or others

9) harmful content — i) having the belief or impression that someone is involved in an illegal or dishonest activity

10) vulnerable — j) to test or check the accuracy or correctness of, as by investigation, comparison with a standard, or reference to the facts.

5. Read, translate and comment on the meaning of the statement.

Children today spend a lot of time online for learning, games, and social media. While the internet offers many opportunities, it also comes with risks like cyberbullying and harmful content. Parents and teachers should help children understand how to stay safe online. Simple rules like not sharing personal information and talking to adults about anything suspicious can make a big difference. Teaching digital safety from a young age is very important.

6. Complete the sentences with the words given below.

phishing	*account hacking*	*malware*	*solution*
vulnerability	*cybercrime*	*personal data*	*threat*

1. Worms are a type of _____ and are aimed at slowing down a system, destroying files and disclosing confidential information.

2. _____ can result in data leakage into the public domain.

3. When leaving _____ on social networks, you can easily become a victim of a criminal or fraudster

4. _____ is an attempt to extract important information from the victim, namely personal data, card numbers, account details, etc.

5. An information system _____ is a flaw or weakness in software that can be exploited to disrupt the system or gain unauthorized access to data.

6. The best _____for online security is to use complex passwords and protect your home Wi-Fi

7. Today, there are a huge number of cyber _____ in the financial and banking industry.

8. Cyber extortion, cyber espionage (theft of confidential data) and cyber terrorism are key types of _____.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the pros and cons of the cloud systems described in the text.

CYBERSECURITY IN TODAY'S WORLD: CHALLENGES AND SOLUTIONS

As more and more of our daily lives move online, cybersecurity becomes very important. Modern cyber threats are getting more complex and can target critical systems like power grids, hospitals, and banks. Attackers often use tricks like phishing, social engineering, and new software vulnerabilities.

One big challenge is protecting cloud systems and networks that are spread across many locations. Traditional security methods are often not enough. New approaches like Zero Trust security, which means «never trust, always verify», are becoming popular. Also, protecting user identities and controlling access is key.

Many companies use automated tools to detect and respond to attacks. These tools often use machine learning to find unusual behavior. But using artificial intelligence also brings new risks. For example, attackers can use AI to create more convincing phishing emails or find ways to bypass security systems.

In summary, cybersecurity is not just about technology. It requires knowledge of networks, cryptography, threat analysis, ethical hacking, and even law. To prepare experts in this field, it is important to combine different skills and keep learning as threats change.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. As more and more of our daily lives move online, cybersecurity becomes not very important.

2. Modern cyber threats are getting more complex and can target critical systems like power grids, hospitals, and banks.

3. Attackers often use tricks like phishing, social engineering, and new software vulnerabilities.

4. One big challenge is protecting only passwords and email.

5. Traditional security methods are often not enough.

6. New approaches like Zero Trust security, which means «never trust, always verify», are becoming popular.

7. Artificial intelligence doesn't bring new risks and attackers cannot use it to bypass security systems.

8. Cybersecurity requires knowledge of networks, cryptography, threat analysis, ethical hacking, and even law.

9. Answer the following questions and retell the text.

1. Why is cybersecurity becoming more important these days?

2. What can cyber threats be targeted at?

3. What tricks do attackers often use?

4. What is the best way to secure cloud systems and networks spread across multiple locations?

5. What tools do companies use to detect cyberattacks?

6. What does cybersecurity require of future professionals in this field?

10. Talking points and discussion.

1. The basics of encryption, hashing and digital signatures, which are used to protect information.

2. Features of multi-factor authentication.

3. Social engineering and protection against it.

4. The role of cybersecurity in business.

11. Role situation.

The dangers of video games in children's and adolescents' life.

Imagine that you are an expert in working with children and adolescents /teenagers/ addicted to video games. Many parents come to you and complain about their children's condition. They describe practically the same symptoms. Especially among them, a personal factor stands out, namely, an unformed or unstable psyche, lack of self-control skills, dissatisfaction with real life, a desire to compensate for unfulfilled vital needs make a person more prone to developing addiction to computer and video games. They also become obsessed with video games and often experience depression and anxiety. Warning signals arise, such as inability to concentrate, sleep disturbance, anxiety, irritation and social phobias. Sometimes children and adolescents start confusing the world of video games and reality and it leads to the exhaustion of their nervous system and the occurrence of panic attacks.

Questions for discission

1) What emergency measures would you advise them to take to?

2) What is your opinion about the situation in general?

3) Is it possible to help such even such individuals against their will?

GRAMMAR ASSIGNMENTS

12. Infinitives and Gerund

Choose the correct form of the verb.

Task: Insert the appropriate form of the verb:

1. Cybersecurity specialists must be prepared (to respond / responding) quickly to zero-day vulnerabilities.

2. Preventing phishing attacks often requires (to monitor / monitoring) user behavior and network traffic in real time.

3. Some experts suggest (to use / using) AI-based tools as a proactive measure in threat detection.

13. Articles

Choose the appropriate article

Task: Insert articles, if necessary

1. Implementing ___ firewall is essential for protecting internal networks from external threats.

2. ___ encryption algorithm used in this protocol was developed by a leading cybersecurity firm.

3. Phishing is ___ increasingly common method of stealing personal data.

14. Tense Practice

Definition of Tenses

Task: Distribute the sentences according to tenses and correct where necessary.

Choose the correct verb form:

1. Yesterday, our system **detects** an unusual login attempt from a foreign IP address.

2. Cybersecurity analysts **are working** on the report when the servers crashed.

3. The IT team **has installed** the antivirus software before the malware attack happened.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. Hackers attacked the company's server last night.

2. The IT department is monitoring suspicious activity.

3. They will implement a new cybersecurity protocol next month.

16. Sequence of Tenses

Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. The analyst said that the breach (happen) because of outdated security protocols.

2. The company reported that hackers (access) their system through a phishing email.

3. The cybersecurity expert explained that multi-factor authentication (reduce) the risk of unauthorized access.

UNIT XII

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Security is not a product, but a process». ***Bruce Schneier***

2. Discuss the following questions.

- Who created Darknet?
- What search engines work on the Darknet?

- Which search engine is better in Tor?
- What is the point of Tor?
- Who owns the Tor browser?
- What is the danger of Tor?
- How to use Tor safely?
- Why was Tor banned?
- What can you do in Tor?
- Where can I download the Tor browser?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Abuse
Anonymity
Cybercriminal
Damage
Drugs
To hide
Hurtful
To insult
Illegal
Whistleblower

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) whistleblower	a) hacker, attacker
2) anonymity	b) to keep back, to conceal
3) damage	c) to offend, to hurt
4) to insult	d) harmful, destructive
5) to hide	e) informer, intelligencer
6) hurtful	f) harm, hurt
7) abuse	g) secrecy, privacy, confidentiality
8) illegal	h) unlawful
9) drugs	i) dope
10) cybercriminal	j) to mistreat, to insult

5. Read, translate and comment on the meaning of the statement.

CYBERBULLYING AND HOW TO AVOID IT

Cyberbullying is a form of psychological abuse that happens online. It includes sending hurtful messages, spreading lies, sharing private information without permission, or insulting someone on social media, in chats, or through email. Unlike face-to-face bullying, cyberbullying can happen at any time and can reach a wide audience very quickly.

Cyberbullying can cause serious emotional damage, including stress, depression, and fear. It is important to recognize it and take action to stop it.

How to Avoid or Prevent Cyberbullying:

Think before you post. Do not share personal or sensitive information online.

Use privacy settings. Limit who can see your content and contact you.

Do not respond to bullies. Ignore and block them instead.

Report abuse. Most platforms have tools to report harmful behavior.

Support others. If you see someone being bullied, offer help or tell someone who can.

As future computer professionals, we should understand the risks of online abuse and help create a safer internet for everyone.

6. Complete the sentences with the words given below.

abuse	*damage*	*whistleblower*	*anonymity*
cybercriminal	*hurtful*	*drugs*	*illegal*

1. Onion Browser (Tor) helps you stay _____online by hiding your IP address and masking your online activity.

2. Some users _____system privileges to access confidential information without permission.

3. Unfortunately, synthetic _____are sold on social media, Clearnet websites and the darknet.

4. Try not to pay attention to _____words and comments online.

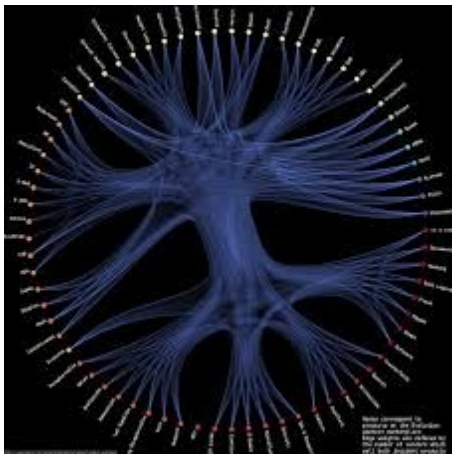
5. Downloading and distributing pirated software is _____ and can lead to security risks.

6. A cyberattack can cause serious _____to a company's data and reputation.

7. The _____exposed serious security flaws in the company's internal network.

8. _____on the darknet not only sell information, but also exchange experience, tools, and attack schemes.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the Darknet specifics described in the text.



WHAT IS DARKNET?

The Darknet is a hidden part of the internet that is not available through regular browsers like Chrome or Firefox. You need special software to access it, such as Tor or I2P. These tools help hide your identity and location, making your internet activity more private.

The Darknet is often linked with illegal activities – like selling drugs, weapons, or stolen data. However, it's not only used for crime. Many people use it to protect their privacy, especially in countries where the internet is heavily controlled. Journalists, whistleblowers, and activists use the Darknet to communicate safely.

For computer science students, the Darknet is important to understand, especially in areas like cybersecurity or digital privacy. It shows how anonymity on the internet works and how cybercriminals can hide their actions. At the same time, it can also be used to protect freedom of speech and personal rights.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. The Darknet is a hidden part of the internet that is not available through regular browsers like Chrome or Firefox.
2. Tor or I2P help hide your identity and location, making your internet activity more private.
3. The Darknet is not often linked with illegal activities – like selling drugs, weapons, or stolen data.
4. The Darknet is used only for crime.
5. Many people use it to protect their privacy, especially in countries where the internet is heavily controlled.
6. Journalists, whistleblowers, and activists use the Darknet to communicate safely.
7. For computer science students, the Darknet is important to understand, especially in areas like cybersecurity or digital privacy.
8. The Darknet doesn't show how anonymity on the internet work and how cybercriminals can hide their actions. It cannot be used to protect freedom of speech and personal rights.

9. Answer the following questions and retell the text.

1.What software do we need to access the Darknet?
2. What activities does the darknet relate to?
3. Where and why do many people use it to protect their privacy?
4. What is important for computer Science students to understand?
5. What does the Darknet show?
6. What is the positive role of the Darknet?

10. Talking points and discussion.

1. Ensuring anonymity in the Darknet.
2. Important Darknet Precautions.
3. Why is it dangerous to access the Darknet?
4. Is the Darknet completely anonymous? Ground up your opinion.

11. Prepare a short presentation on the reasons for using the Darknet in countries with strict internet control. Use the following introductory words and phrases to sound logical and clear.

1. Let me draw your attention to the issue of…/Let me introduce you to the issue of…

2. It's common knowledge that…/So far is known…

3. On the one hand… on the other hand…

4. In addition…/Moreover…/Furthermore…/Besides…/To add to this…

5. In conclusion…/To sum it up…/In a nutshell…/Summing it up…

GRAMMAR ASSIGNMENTS

12. Complex Object

Choose the correct form of the verb.

Task: Insert the appropriate form of the verb:

1. The company made the employee (to change/change) his password.

2. We noticed the hacker (try/trying) to access the system.

3. They want the IT department (to investigate/investigate) the incident.

13. Prepositions

Choose the appropriate preposition

Task: Insert prepositions, if necessary

1. Hackers often break … systems without permission.

2. The confidential data was stored … a secure server.

3. Cybercriminals communicate … encrypted networks like the Darknet.

14. Tense Practice

Definition of Future Perfect Tense

Task: Distribute the sentences according to tenses and correct where necessary.

Choose the correct verb form:

1. By the time the IT team (to arrive), the hacker (to delete) all the

evidence.

2. The system (to complete) the security scan before midnight.

3. By 2026, most companies (to implement) stronger cybersecurity measures.

15. Passive vs Active Voice

Convert to Active

Task: Convert the sentences to active voice.

1. The data was stolen by a hacker.

2. The system will be updated by the IT department tomorrow.

3. Sensitive files are protected by encryption.

16. Complex Object

Translate from Ukrainian into English

Task: Translate the sentences from Ukrainian into English using Complex Object

1. Я бачив, як хакер увійшов до системи.

2. Адміністратор змусив користувача змінити пароль.

3. Компанія хоче, щоб експерти з безпеки перевірили мережу.

UNIT XIII

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Cybersecurity is much more than an IT topic – it's a business risk issue».

Stephane Nappo (Global Chief Information Security Officer)

2. Discuss the following questions.

- Why is cybersecurity important for businesses?
- What are the most common cyber threats for companies today?
- How can employees help protect a company from cyberattacks?
- Should all companies invest in cybersecurity, even small ones?
- What should a company do after a cyberattack?

- Is it safe for businesses to store data in the cloud?
- How can strong passwords help protect company information?
- Why is it dangerous to click on unknown email links at work?
- What is the role of antivirus software in business security?
- How can companies teach their workers about cybersecurity?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Afterthought
Array
Breach
Business imperative
Convergence
To evolve
To exceed
Holistic
Legal compliance
Ransomware attacks
Regulatory sanctions

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) holistic	a) to present
2) interconnection	b) relationship
3) significant	c) comprehensive, integral, complex
4) robust	d) to surpass
5) increasingly	e) more and more often
6) essential	f) reliable
7) to evolve	g) indispensable
8) to pose	h) more and more often
9) array	i) considerable, substantial
10) to exceed	j) range, scope

5. Read, translate and comment on the meaning of the statement.

Cybersecurity is a critical field in today's digital world. As more businesses rely on technology, the risk of cyberattacks continues to grow. Cybersecurity protects sensitive data, systems, and networks from threats such as hacking, malware, and phishing. Professionals in this area must think critically to identify vulnerabilities and respond to incidents effectively. They also need to stay updated on new attack methods and defense strategies. Strong cybersecurity helps companies maintain trust, avoid financial losses, and comply with regulations. For computer science students, understanding cybersecurity is essential for building safe and reliable digital solutions.

6. Complete the sentences with the words given below.

to exceed *afterthought* *holistic* *continuity*
ransomware attacks *to evolve* *array* *convergence*

1. Organizations use an _____of cybersecurity tools to detect and prevent unauthorized access.
2. A _____cybersecurity strategy includes not only technical solutions, but also employee training and risk management.
3. Disaster recovery plans are essential to maintain business _____during cyber incidents.
4. _____are becoming more frequent and often force companies to choose between paying a ransom or losing critical data.
5. As technology _____, so do the methods used by cybercriminals to exploit systems.
6. The _____ of information technology and operational technology has created new security challenges.

7. For many years, cybersecurity was treated as an _____rather than a priority.

8. The financial damage caused by the data breach _____ all initial estimates.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the main cybersecurity issues that are common to small, medium and large enterprises.

CYBERSECURITY IN BUSINESS: A STRATEGIC IMPERATIVE FOR THE DIGITAL AGE

In today's interconnected digital economy, cybersecurity has evolved from a technical afterthought to a strategic business imperative. As organizations increasingly rely on digital infrastructure for operations, communication and data management, they face an ever-growing array of cyber threats. These threats – ranging from data breaches and ransomware attacks to insider threats and supply chain vulnerabilities – not only pose significant financial risks but also threaten organizational reputation, legal compliance, and operational continuity.

THE BUSINESS IMPACT OF CYBER THREATS

Cyberattacks can have severe financial consequences. According to various global reports, the average cost of a data breach now exceeds several million dollars. Beyond direct financial losses, businesses may face regulatory penalties (such as those under GDPR or HIPAA), class-action lawsuits, and long-term reputational damage. Small and medium-sized enterprises (SMEs), which often lack a robust cybersecurity infrastructure, are particularly vulnerable and may have difficulty in recovering after a major incident.

Moreover, cyberattacks are increasingly targeting not just IT systems but also operational technologies (OT), especially in sectors such as manufacturing, energy, and healthcare. This convergence of IT and OT security has made it essential for businesses to adopt a holistic cybersecurity strategy.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.

2) Highlight keywords that reflect the essence of the text.

3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. In today's interconnected digital economy, cybersecurity has evolved from a technical afterthought to a strategic business imperative.

2. Organizations don't rely on digital infrastructure for operations, communication and data management and don't face an ever-growing array of cyber threats.

3. Data breaches and ransomware attacks don't pose significant risk.

4. Insider threats and supply chain vulnerabilities don't threaten organizational reputation, legal compliance, and operational continuity.

5. Cyberattacks can have severe financial consequences.

6. According to various global reports, the average cost of a data breach now exceeds several million dollars.

7. Beyond direct financial losses, businesses may face regulatory penalties (such as those under GDPR or HIPAA), class-action lawsuits, and long-term reputational damage.

8. Small and medium-sized enterprises (SMEs), also have a robust cybersecurity infrastructure, are particularly vulnerable and may struggle to recover after a major incident.

9. Large enterprises particularly vulnerable and may have difficulty in recovering after a major incident.

10. Moreover, cyberattacks are increasingly targeting not just IT systems but also operational technologies (OT), especially in sectors such as manufacturing, energy, and healthcare. This convergence of IT and OT security has made it essential for businesses to adopt a holistic cybersecurity strategy.

9. Answer the following questions and retell the text.

1. How has cybersecurity evolved today?

2. What are the most common challenges organizations face?

3. How can the security infrastructure of small and medium-sized enterprises be characterized?

4. What severe financial consequences can cyberattacks have?

5. What regulatory penalties may businesses face?

6. What problems can small and medium-sized businesses suffer from?

7. What are cyberattacks increasingly targeting?

8. Describe a holistic cybersecurity strategy in a few words.

10. Talking points and discussion.

1. Why is cybersecurity important for business?
2. What are the three elements of cybersecurity?
3. What is the most dangerous information security threat to a company?
4. How to ensure cybersecurity in business?

11. Write essays on relevant topics.

1. Describe the 5 Cs of Cybersecurity and their importance.
2. Reveal the essence of business information security.

GRAMMAR ASSIGNMENTS

12. Modals

Use of modal verbs in technical contexts

Task: Insert the appropriate form of the verb:

1. All users _____reset their passwords every 90 days to maintain system security.

2. This software _____ run on outdated operating systems.

3. Engineers _____ check the server logs regularly to detect suspicious activity.

13. Participles & Relative Clauses

Choose the appropriate construction, tense, voice

Task: Translate the sentences with participles or subordinate clauses into Ukrainian.

1. The data **stored on the external server** must be encrypted.

2. Developers who **understand secure coding practices** are in high

demand.

3. The system **being tested** now will replace the old one next month.

14. Grammar-based translation

Definition of tenses, voices and constructions

Task: Combine the sentences using participles or subordinate clauses.

1. The company collected the data. The data is confidential.

2. The engineer fixed the bug. The bug caused the system crash.

3. The team is developing a new software. The software will improve security.

15. Conditionals

Types of conditional sentences

Task: Translate the sentences from English into Ukrainian.

1. If the company updates its security system, it will prevent many attacks.

2. If the developers had tested the software thoroughly, the bug would not have caused problems.

3. If employees knew more about phishing, they might avoid cyber threats.

16. Determine the time and correct errors

Task: Find and correct the errors and determine the tense of each sentence.

1. The company **have** been working on the new security protocol since three months ago.

2. If the system **was** protected better, it wouldn’t be hacked last week.

3. Employees **is** trained regularly to prevent cyber threats.

UNIT XIV

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Cybersecurity is not just a technology issue; it's a people issue».

Author Unknown

2. Discuss the following questions.

- What are the main ways a computer can become infected with a virus?
- What are the main signs that your computer is infected with a virus?
- In what case will a computer be infected with a virus?
- What objects can be infected with computer viruses?
- What is the name of the malware that disrupts the operation of a computer?
- What kind of virus allows an attacker to control a computer?

- Why are passwords considered one of the weakest points in the system?
- Why should you be careful when posting on the Internet?
- Why is it useful to have a temporary email account that you use exclusively for signing up?
- Why is using pirated materials dangerous?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Application
Authentication
Backdoor
Credentials
To deal with
To design
To disable
To infect
To log into
Temporary

4. Pay attention to the given words and match them with their definitions. Make up your own situations with them.

1) fake	a) malicious software
2) RATs	b) broken, hacked
3) cracked	c) a system of symbols for brevity or secrecy
4) screenshot	d) an image that you create by copying part or all of the display on a computer or phone screen
5) 2FA (two-factor authentication)	e) numerical value
6) code	f) piece of any document that details a qualification, competence etc.
7) symbol	g) an object, person, or act that is not genuine; sham, counterfeit, or

forgery

8) to install — h) sneaky intruders

9) backdoor — j) a security method for identity and access management

10) credentials — i) to make (a machine, a service, etc.) ready to be used in a certain place

5. Read, translate and comment on the meaning of the statement.

CREDENTIALS

User credentials are the pieces of information we use to log into systems, websites, or applications. The most common type of credentials are a username and password. Some systems also use two-factor authentication (2FA), which adds an extra layer of security – like a code sent to your phone or email.

If someone steals your credentials, they can access your personal accounts, read your messages, or even steal your money. That's why it's important to use strong passwords, never share them, and avoid using the same password for different websites. A good password should include letters, numbers, and symbols.

To keep your credentials safe, you can use a password manager, which stores and creates secure passwords for you. Also, always be careful with phishing emails and suspicious websites – they often try to trick you into giving away your login details.

6. Complete the sentences with the words given below.

2FA	*to design*	*temporary*	*to deal with*
credentials	*application*	*to log into*	*to disable*

1. You need _____the system before you can access any personal information.

2. The antivirus program may _____some apps if it detects suspicious behavior.

3. Never share your _____ with anyone, even if they say they are from tech support.

4. IT specialists are trained _____ security threats like phishing and ransomware.

5. This _____allows users to store their passwords safely in an encrypted format.

6. You will get a _____ password by email, which you should change after logging in.

7. _____adds an extra level of security when you log into your account.

8. Our team is working to _____a new mobile app with better privacy settings.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the main dangers of trojan virus.

TROYANS: HOW THEY WORK

A Trojan virus is a type of malware that hides behind something that seems safe or useful – like a free program, a game, a document, or even a fake system update. The name comes from the story of the Trojan Horse in ancient Greek mythology, where enemies hid inside a wooden horse to trick their way into a city. In the same way, a Trojan virus tricks users into installing it, and once it's inside the system, it starts doing harm in the background.

Unlike worms or regular viruses, Trojans don't spread by themselves. They need the user to open or run them. That's why they're often spread through phishing emails, fake downloads, or cracked software. Once activated, a Trojan can

give hackers remote access to your device, steal your passwords or personal files, record everything you type, take screenshots, or even use your webcam or microphone without your knowledge. Some Trojans are also used to download more malware onto your device or disable your antivirus protection.

There are different types of Trojans depending on what they're designed to do. Some create backdoors into the system, letting attackers control it remotely. Others focus on stealing banking data when you log into financial websites. There are also downloader Trojans that just bring in other viruses, and so-called RATs (Remote Access Trojans) that let someone control your entire computer from a distance. Some Trojans are designed specifically to spy on users and monitor their activity.

Some well-known examples of Trojan viruses include Zeus, which stole banking details from millions of people, and Emotet, which started out as a banking Trojan but later became a tool for spreading other dangerous malware like ransomware. Another example is NanoCore, a remote access Trojan that allows full control of an infected machine — including turning on webcams or stealing sensitive documents.

To stay safe from Trojans, it's important to be careful about what you download and where you download it from. Don't open suspicious email attachments or click on random links, especially from unknown senders. Keep your operating system and all software up to date, use a good antivirus program, and don't disable your system's security features. Strong passwords and two-factor authentication can also help protect your accounts in case something gets through.

Trojans are dangerous because they often look completely harmless – until it's too late. That's why understanding how they work is so important, especially for people working in tech or studying cybersecurity. Knowing how to recognize and prevent these threats is one of the key skills for anyone dealing with modern digital systems.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. Trojan virus is a type of malware that hides behind something that seems safe or useful – like a free program, a game, a document, or even a fake system update.

2. The name comes from the story of the Trojan Horse in ancient Greek mythology, where enemies hid inside a wooden horse to trick their way into a city.

3. In the same way, a Trojan virus tricks users into installing it, and once it's inside the system, it starts doing harm in the background.

4. Trojans spread just like worms and common viruses. They do not need the user to open or run them.

5. They're not spread through phishing emails, fake downloads, or cracked software.

6. Some Trojans create backdoors into the system, letting attackers control it remotely. Others focus on stealing banking data when you log into financial websites.

7. Zeus started out as a banking Trojan but later became a tool for spreading other dangerous malware like ransomware.

8. NanoCore, a remote access Trojan that allows full control of an infected machine – including turning on webcams or stealing sensitive documents.

9. Strong passwords and two-factor authentication can also help protect your accounts in case something gets through.

10. Trojans are not dangerous because they often look completely harmless. That’s why understanding how they work is not so important.

9. Answer the following questions and retell the text.

1. Describe the history of a Trojan virus.
2. How are Trojans spread?
3. What can the Trojan do after activation?
4. Characterize the main types of Trojans.
5. Give examples of known Trojan viruses.
6. How can you protect yourself from Trojans?
7. Why are Trojans dangerous?
8. What can prevent the threat of Trojans?

10. Talking points and discussion.

1. How to understand that there is a Trojan?
2. How to remove a Trojan virus?
3. Where do Trojans come from?
4. What is a Trojan attack?

11. Work in pairs. Make up dialogues on these topics using the active vocabulary of the lesson (sensitive information, victim, attackers, identity theft, ransomware, spyware, infected system, data breach).

1. Can a cyberattack be considered an act of war?

2. Is it possible to be 100% secure online?

3. Should companies be fined for weak cybersecurity if user data is leaked?

4. What's more dangerous: external hackers or insider threats?

5. Are users the weakest link in cybersecurity?

GRAMMAR ASSIGNMENTS

12. The Sequence of Tenses

Translate from English into Ukrainian

Task: Translate the sentences to English into Ukrainian and explain the use of appropriate tenses:

1. The professor said that the system had already been breached before the firewall update was applied.

2. She explained that they were analyzing the network traffic to detect unusual activity.

3. He mentioned that the encryption algorithm would be updated in the next version of the software.

13. The Sequence of Tenses

Insert the correct form of the verb

Task: Use the verbs in brackets in the correct form.

1. The expert said that the company (need) stronger cybersecurity measures.

2. She explained that hackers (steal) personal data from unsecured websites.

3. He warned us that if we (not update) our passwords regularly, we could become victims of cyberattacks.

14. I wish

Types of conditional sentences

Task: Translate the sentences from Ukrainian into English and explain the use of appropriate tenses.

1. Я хотів би, щоб наша система була краще захищена від хакерів.

2. Шкода, що я не встановив антивірусу раніше.

3. Хотілося б, щоб користувачі вибирали більш надійні паролі.

15. Complex Object

Find and correct errors

Task: Find errors in the use of Complex Object and correct them:

1. The security officer saw the hacker **to enter** the database.

2. We want all users **changing** their passwords regularly.

3. The system administrator let me **to install** the new firewall.

16. Complex Object

Translate from Ukrainian into English

Task: Translate the sentences from Ukrainian into English using Complex

1. Вони не дозволили мені встановити невідомий додаток.

2. Ми очікуємо, що користувачі будуть дотримуватися політики безпеки.

3. Менеджер з питань безпеки попросив мене перевірити журнал активності.

UNIT XV

LEAD-IN

1. Read one of famous quotes by outstanding writers and politicians about modern technologies and computers and express your own opinion about its essence: «Cybersecurity is not just about technology; it's about people, processes, and awareness. Without a strong culture of security, even the best tools can fail». ***Author Unknown***

2. Discuss the following questions.

- Why is cybersecurity important in today's world?
- Where is the line between privacy and security?
- Is it ethical to hack for a good cause (e.g., exposing corruption)?
- Do you think perfect cybersecurity is possible? Why or why not?

- How has cybersecurity changed in the last 10 years?
- What does cybersecurity mean to you?
- Should governments have access to encrypted messages?
- Should companies pay ransom in case of a ransomware attack?
- How can we encourage more students to study cybersecurity?
- What is the most interesting area of cybersecurity to you, and why?

READING AND SPEAKING

3. Read, translate, explain the meaning of the lexical units and memorize them.

Antivirus
Exploit
Firewall
Infection
Malware
Network
Payload
Propagation
Self-replicant
Worm

4. Pay attention to the given words and match them with their synonyms. Make up your own situations with them.

1) backdoor
2) trojan
3) scan
4) patch
5) vulnerability
6) quarantine
7) botnet
8) intrusion
9) detection
10) security breach

a) A software update that fixes security problems or bugs to protect the system.

b) The process of checking a computer or network for weaknesses, viruses or open ports.

c) The act of finding malware, intrusions, or suspicious activity in a computer system.

d) A safe place where antivirus software puts suspicious or harmful files so they can't harm the computer.

e) When someone gets unauthorized access to data, systems, or networks – often leading to data theft or damage.

f) When someone breaks into a computer or network without permission.

g) A group of infected computers controlled by a hacker to do bad things like send spam or attack websites.

h) A weakness in software or a system that hackers can use to attack or break in.

i) A type of malware that looks like a safe program, but once installed, it gives control to a hacker.

j) A hidden way to get into a computer system without normal login. Hackers use it to secretly control or steal data.

5. Read, translate and comment on the meaning of the statement.

Many people, especially teenagers, suffer from mean comments, threats, and public shaming on social media. Unlike in real life, online bullies can hide behind fake names, which makes them feel more powerful and less responsible.

I believe that social media platforms should do more to protect users by removing harmful content and blocking bullies. People should also be more careful with their words and think about how they affect others. Everyone deserves to feel safe online.

6. Insert the necessary prepositions.

(between, via, due to, on, in, through, against, of, to)

1. The worm spread **through** the entire network in just a few minutes.
2. He gained access **to** the system using a hidden backdoor.
3. The malware was hidden **in** a fake email attachment.
4. The security team protected the server **against** external threats.

5. The virus entered the computer **via** a USB drive.
6. Hackers took control **of** hundreds of devices to form a botnet.
7. The patch was installed **on** all company computers.
8. The attack came **from** an unknown IP address.
9. The worm was able to move **between** connected devices.
10. The data breach occurred **due to** a known vulnerability.

7. Look at the title of the text. What do you think the text will include? Read and translate the text into Ukrainian. Characterize the risks of computer worms.

WHAT ARE COMPUTER WORMS

A computer worm is a type of malicious software (malware) that can spread from one computer to another without any help from the user. Unlike computer viruses, worms do not need to attach themselves to other programs or files. They are standalone programs that copy themselves and try to move through networks, USB drives or the Internet.

Worms usually spread in the following ways:

- Through the Internet or local networks by finding computers with weak security or unpatched software.
- Through email by sending infected attachments or links that people might click.
- Through USB flash drives when people plug them into different computers.

Some worms can copy themselves very quickly and spread across many systems in just minutes or hours.

Worms can cause a lot of damage, such as:

- Slowing down or crashing networks and systems.
- Deleting or stealing files and sensitive data.
- Installing other malware like ransomware or spyware.
- Allowing hackers to take control of infected systems.

Some famous worms like ILOVEYOU, WannaCry, and Conficker have caused damage to millions of computers around the world.

To stay safe from computer worms, it’s important to:

- Keep your system and software updated.
- Use antivirus and firewall programs.
- Avoid opening suspicious emails or clicking unknown links.
- Be careful when using USB drives on different computers.
- Use strong passwords and disable unused network services.

Computer worms are a serious threat because they can spread quickly and don’t need any user action. Understanding how they work helps people protect their computers and networks more effectively.

WORKING WITH THE TEXT

1) Make a detailed plan of the text.
2) Highlight keywords that reflect the essence of the text.
3) Determine the essence of the text.

8. Read the text again. Agree or disagree with the following statements according to the text.

1. **A** computer worm is a type of malicious software (malware) that can spread only by user.
2. Unlike computer viruses, worms do not need to attach themselves to other programs or files.
3. Worms do not spread via the Internet or email.
4. Worms always delete or steal files and sensitive data.
5. Worms never install other malware like ransomware or spyware.
6. Worms do not allow hackers to take control of infected systems.
7. Unknown links are absolutely safe and harmless.
8. You don't need to avoid suspicious programs and emails because worms do not penetrate into them.
9. You need to keep your system and software updated in order to avoid infection with worms.
10. Computer worms are a serious threat because they can spread quickly and don’t need any user action.

9. Answer the following questions and retell the text.

1. What is computer worm?
2. How do worms spread?
3. How can we protect against worms?
4. Can strong passwords help us avoid computer worm infection?

5. Are antivirus programs and firewalls considered reliable against worm infections?

6. Why is it necessary to update the software?

7. Why is it necessary to disable unused network services?

10. Talking points and discussion.

1. Will AI make cybersecurity better or worse?
2. How can small businesses protect themselves against cyber threats?
3. What are the risks of smart devices (IoT) in homes and cities?
4. What do you think the future of cybersecurity will look like?

11. What do you think, how modern people react the fact that it is impossible to live without computers today and find many delights in the virtual world thanks to them.

ROLE PLAY

BULLYING IN OUR LIFE

Situation: A group of students discuss the reasons why some people are bullied while others are not.

The main characters of the discussion are:

Opponents – is a group of participants, insisting on one or another point of view; **observers** – is a tutor with **a few assistants.**

Three groups of participants prove the correctness of the opposite point of view.

The first group proves that some people can be bullied because for many reasons

- Different appearance; different style or interests

- Social status
- Origin or culture
- Disability
- Envy or competition

The second group proves that it would be advisable to look at this situation from a different angle because

- Bullies can also suffer from a low self-esteem
- Bullies can have serious problems in the family
- The influence of friends or environment also leaves its mark (simply because that's what everyone in the group does.)
- A person may be afraid that he will be bullied
- A person may think that everything is allowed to him

The third group proves that everything in this world is relative and sometimes a person doesn't even understand that he is being bullied

- Bullying can be disguised as «jokes»
- The man is used to being treated badly
- A person is afraid to admit the truth or thinks that there is something wrong with him
- Bullying happens gradually
- The man doesn't know what bullying is

QUESTIONS FOR DISCUSSION

1. What is the difference between bullying and joking?
2. How does bullying affect the victim?
3. Is cyberbullying more dangerous than face-to-face bullying?
4. What should you do if you see someone being bullied?

5. Can bullying ever be completely stopped?

GRAMMAR ASSIGNMENTS

12. Tenses

Determine the time and correct errors

Task: Find and correct the grammatical errors in the following sentences:

1. Hackers was attacked the system last night.

2. The system is crashing when we run the scan.

3. We will detecting vulnerabilities during the next audit.

13. Tenses

Insert the correct form of the verb

Task: Use the verbs in brackets in the correct form.

1. The students (learn) how to use intrusion detection systems this semester.

2. By the time we noticed the attack, the intruder (already/steal) the data.

3. Yesterday, someone (try) to access the admin panel without authorization.

14. Conditionals.

Types of conditional sentences

Task: Determine the type of conditional sentence (0, 1, 2, 3) and correct errors, if any.

1. If the server overheats, it **shuts down** automatically.

2. If the company **had implemented** multi-factor authentication, the breach would not have occurred.

3. If we **scan** the network now, we will find the malware.

15. Passive vs Active Voice

Convert to Passive

Task: Convert the sentences to passive voice.

1. The developers will deploy the patch the day after tomorrow.

2. They discovered a vulnerability in the software last night.

3. The technician is fixing the server right now.

16. Modal verbs.

Choose the correct modal verb

Task: Insert the appropriate modal verb (can, should, must, might, have to, etc.).

1. You _____ use a strong password to protect your accounts.

2. Hackers _____ try to steal your personal information, so be careful.

3. Employees _____ follow the company's cybersecurity policies at all times.

НАУКОВИЙ ДОВІДНИК

SCIENTIFIC GUIDE

СТРУКТУРА, ПЛАН ТА ПРИКЛАДИ НАПИСАННЯ ЕСЕ

STRUCTURE, PLAN AND EXAMPLES OF WRITING AN ESSAY

І. ЩО ТАКЕ ЕСЕ

WHAT IS AN ESSAY?

Есе – це невеликий відкритий текст, що висловлює особисті думки автора на певну тему. Воно дозволяє автору висловити свою креативність та аналітичні здібності, а також виробити свій власний стиль письма.

Есе є одним із найпоширеніших видів письмових робіт, який використовується як у навчанні, так і в позанавчальних сферах. Це короткий текст, у якому автор висловлює свої думки, робить аналіз, доводить свою точку зору або висловлює думки на певну тему. У даному тексті розглянемо структуру есе, розкажемо про планування і написання есе, а також наведемо приклади різних типів есе.

ІІ СТРУКТУРА ЕСЕ

ESSAY STRUCTURE

Структура есе досить гнучка, але вона зазвичай включає в себе наступні елементи, а саме

Вступ (Introduction)

Привернення уваги читача – Attracting the reader's attention

Представлення теми есе – Introducing the topic of the essay

Формулювання тези есе – Formulating the thesis of the essay

Основна частина (The Main Part/The Main Body)

Аргумент 1

Докази, які підтримують аргумент 1 – Evidence that supports argument 1

Аргумент 2

Докази, які підтримують аргумент 2 – Evidence that supports argument 2

Аргумент 3

Докази, які підтримують аргумент 3 – Evidence that supports argument 3

Висновок – Conclusion

Підсумовування основних аргументів есе – Summary of the main arguments of the essay

Висновок – Conclusion

Вступ: У цьому розділі ви привертаєте увагу читача інтригуючими фактами, цитатою, або загальним зіставленням з темою. Основною метою вступу є зацікавити читача і залучити його увагу до вашого есе.

Introduction: In this section, you attract the reader's attention with an intriguing fact, a quote, or a general comparison with the topic. The main purpose of the introduction is to interest the reader and attract their attention to your essay.

Теза: Це ключове речення або декілька речень, що визначають головну думку вашого есе. Теза повинна бути чіткою і лаконічною. У ній ви формулюєте головний аргумент, який будете розвивати в решті тексту.

Thesis: This is the key sentence or several sentences that define the main idea of your essay. The thesis should be clear and concise. In it you formulate the main argument that you will develop in the rest of the text.

Основна частина: Тут ви розкриваєте свою думку, аргументуючи її прикладами, доказами, статистикою та іншими обґрунтуваннями. Рекомендовано користуватися параграфами для структурування ідеї та підтримки аргументів.

The Main Part/ The Main Body: Here you reveal your opinion, supporting it with examples, evidence, statistics, and other justification. It is recommended to use paragraphs to structure your ideas and support your arguments.

Антитеза: Цей елемент є необов'язковим, але в ньому можна висловити альтернативну точку зору чи контраргументи. Це допоможе показати вашу глибоку обізнаність з темою та вміння розглядати різні погляди.

Antithesis: This element is optional, but it can express an alternative viewpoint or counterargument. This will help show your deep knowledge of the topic and your ability to consider different points of view.

Висновок: Заключний абзац має підбити підсумки вашого есе, підкреслити головний аргумент і, можливо, залишити читача з думкою на майбутнє.

Conclusion: The final paragraph should summarize your essay, emphasize your main argument, and perhaps leave the reader with something to look forward to.

ІІІ ПЛАН ЕСЕ

A PLAN OF AN ESSAY (AN OUTLINE FOR AN ESSAY)

Першим кроком при написанні есе є створення плану. План допомагає вам організувати свої думки і структурувати текст. Він може бути таким:

The first step in writing an essay is creating an outline. An outline helps you organize your thoughts and structure your text. It might look like this:

Визначення теми: Якщо тема не вказана, виберіть ту, яка вас цікавить або з якою ви знайомі.

Definition the topic: If a topic is not specified, choose one that interests you or that you are familiar with.

Розроблення тези: Сформулюйте основну думку, яку ви будете захищати в есе.

Developing a thesis: Formulate the main idea that you will defend in the essay.

Аргументація: Визначте головні аргументи, які підтверджують вашу тезу. Зберіть приклади, докази, статистику тощо.

Argument: Identify the main arguments that support your thesis. Gather examples, evidence, statistics, etc.

Антитеза: Розгляньте можливі контраргументи і як ви будете їх опротестовувати.

Antithesis: Consider possible counterarguments and how you will counter them.

Висновок: Підведіть підсумки і підкресліть значущість вашої думки.

Conclusion: Summarize and highlight the importance of your opinion.

ІV ЯК ПРАВИЛЬНО ПИСАТИ ЕСЕ

HOW TO WRITE AN ESSAY CORRECTLY

Розуміння теми: Уважно читайте і аналізуйте тему. Визначте основну мету та обмеження.

Understanding the topic: Carefully read and analyze the topic. Define the main purpose and limitations.

Дослідження: Якщо потрібно, здійсніть додаткове дослідження для збору додаткових доказів та прикладів.

Research: If necessary, conduct additional research to gather additional evidence and examples.

Планування: Створіть структурований план есе з визначенням ключових моментів, які ви хочете включити.

Planning: Create a structured essay plan (a structured outline for the essay), identifying the key points you want to include.

Вступ: Зацікавте читача з перших рядків, приверніть його увагу та покажіть актуальність теми.

Introduction: Interest the reader from the first lines, attract their attention and show the relevance of the topic.

Розвиток ідей: Розкрийте свої аргументи і думки в основній частині. Дотримуйтесь логічного порядку і послідовності.

Development of ideas: Reveal your arguments and thoughts in the main part (in the main body). Follow a logical order and sequence.

Антитеза: Не уникаючи протиріч, розгляньте можливі контраргументи і надайте їм адекватну відповідь.

Antithesis: Without avoiding contradictions, consider possible counterarguments and provide an adequate response to them.

Висновок: Підбийте підсумки вашого есе, підкресліть його важливість та можливі перспективи дослідження.

Conclusion: Summarize your essay, emphasize its importance and possible research prospects.

Розглянемо декілька прикладів написання есе.

TOPIC 1

«THE INFLUENCE OF THE INTERNET ON MODERN USE»

Introduction: The Internet has become an integral part of the lives of modern youth. It is a source of endless opportunities, but also problems. In this essay, we will consider how the Internet affects young people and what opportunities and threats it carries.

Thesis: The Internet helps young people broaden their horizons, make new friends, and develop, but it can lead to addiction and isolation.

Main part: First, the Internet opens up unlimited access to knowledge for young people. Thanks to search engines and educational resources, they can learn anything at any time. In addition, social networks make it possible to find communities of interests, share thoughts and gain new knowledge.

Further, the Internet provides young people with the opportunity to have fun and relax. Online games, streaming services and YouTube allow you to find entertainment for every taste. However, this can lead to addiction to the virtual world and loss of control over time.

Antithesis: On the other hand, the Internet can lead to isolation of young people. A large amount of time spent online can lead to a decrease in communication skills and limit the number of offline conversations.

Conclusion: The Internet is a powerful tool that can significantly change the lives of young people. Using it with understanding and caution, young people can gain new knowledge, make friends and develop, while avoiding possible threats and negative consequences.

TOPIC 2

«THE RISE OF DANGEROUS ONLINE GAMES: HOW TO PREVENT PSYCHOLOGICAL AND SECURITY RISKS AMONG TEENAGERS»

Introduction

A brief overview of the popularity of online games among teenagers.

Mentioning cases of dangerous games (e.g. «Blue Whale», «Momo Challenge», «Red Owl»).

Thesis: Dangerous online games pose both psychological and cyber threats, and it is important to look for ways to prevent them.

Body Paragraphs

Nature of Dangerous Online Games

What makes a game dangerous? (manipulation, tasks, pushing towards self-destruction)

How they spread (social networks, anonymous forums, instant messengers).

Psychological Risks

Impact on the teenage psyche: pressure, fear, isolation.

Risks: depression, anxiety, suicidal thoughts.

Cybersecurity Risks

Personal data leakage (games require photos, personal information).

Possibility of infecting devices with malware.

Using games as a tool for recruitment or blackmail.

Prevention Strategies

Education and digital literacy (for parents, teachers, teenagers).

Creating safe gaming platforms.

The role of the state and developers: moderation, reporting, legal measures.

Conclusion

Dangerous games are not just «children's pranks», but real threats.

A comprehensive approach (technical, educational and psychological) is the best way to combat them.

A call for vigilance and interdisciplinary cooperation.

A call for vigilance and interdisciplinary cooperation.

TOPIC 3

«SOCIAL EGINEERING IN ONLINE GAMES: HOW CYBERCRIMINALS MANIPULATE PLAYERS»

Introduction

Online gaming is not only entertainment, but also a risky environment.

Definition of social engineering

Thesis: Online gaming is becoming a platform for manipulation, data theft, and even recruitment.

Body Paragraphs

How Social Engineering Works in Games

Trust atmosphere: players share personal information.

Methods: phishing, fake offers, fake admins/moderators.

Examples of Manipulation

«Fake friends» ask for logins/passwords.

Fraudsters offer «free currency» or «cheat codes» - virus infection.

Cases with real damage (we can cite incidents with theft of accounts in Steam or

Roblox).

Why Gamers Are Vulnerable

Trust in the «community».

Lack of digital literacy.

Lack of parental control or awareness.

Preventive Measures

Learning to recognize social attacks.

Two-factor authentication, restricting access to data.

Responsibility of developers (built-in warnings, complaint system).

Conclusion

Online games are the new front of cyber wars, where the main target is the user.

Understanding social engineering and protection are the key to a safe gaming experience.

Efforts are needed from players, parents and the industry.

V ОСОБЛИВОСТІ ПОШУКУ КЛЮЧОВИХ СЛІВ У СТАТТЯХ/ТЕЗАХ

FEATURES OF KEYWORD SEARCH IN ARTICLES/THESES

Ключові слова (keywords) в тексті – це слова або фрази, які точно описують зміст документа, сайту чи оголошення, тим самим дозволяючи користувачам та пошуковим системам зрозуміти його тематику. Вони служать «точками дотику» між запитами користувачів у пошукових системах та релевантним контентом на веб-сторінках, що підвищує видимість сторінок у пошуковій видачі та допомагає залучити цільову аудиторію.

Для того, щоб визначити ключові слова в тексті, потрібно визначити його основну тему, узагальнити її та висловити 2-3 слова. Ключові слова не завжди складаються з одного слова. Це може бути група слів, які формують фразу.

Розглянемо декілька прикладів пошуку ключових слів для тез.

Наприклад, тема тези «Вплив соціальних мереж на підлітків»/ «The Impact of Social Networks on Teenagers».

Ключовою темою будуть «соціальні мережі» та «підлітки».

The key theme will be «social networks» and «teenagers».

Таким чином, виходячи з усього вищесказаного, по-перше, необхідно визначити основну тему тези. По-друге, треба виділити основні поняття та

виписати іменники та важливі терміни, а точніше слова, які регулярно повторюються або є важливими для розуміння.

What words are repeated or important to understand?

For example, influence, social networks, teenagers, behavior.

Далі, суттєвим аспектом також буде виступати використання синонімів або пошук слів-зв'язок. Треба ретельно поміркувати, які слова близькі за змістом чи використовуються у науковій літературі.

Наприклад: вплив → дія, ефект; соціальні мережі → онлайн-платформи, цифрові медіа.

For example, influence → impact, effect; social networks → online platforms, digital media.

Якщо у тезі є конкретні напрямки (наприклад, психологічний вплив, час використання), їх також потрібно додати до списку ключових слів.

Наприклад: психологічне здоров'я, час екрану, спілкування.

For example, mental health, screen time, communication.

Ключові слова повинні точно відображати твою тему, а не бути надто загальними.

Наприклад, замість терміну «технології» краще сказати «соціальні мережі» або «мобільні програми».

For example, «technology» can be replaced by «social measures» or «mobile programs».

Перевірка ключових слів у надійних джерелах (книгах або статтях) допоможе підібрати слова, які саме є актуальними у даній галузі.

Приділимо увагу ще декільком прикладам.

«Соціальні мережі мають значний вплив на психологічне здоров'я підлітків, збільшуючи рівень тривожності та знижуючи якість сну».

«Social networks have a significant impact on the psychological health of adolescents, increasing anxiety levels and reducing sleep quality».

Ключові слова: соціальні мережі, психологічне здоров'я, підлітки, тривожність, якість сну

Keywords: social media/networks, adolescents/teenagers, psychological health, anxiety, sleep quality.

VI ПРИКЛАДИ НАПИСАННЯ ТЕЗ

EXAMPLES OF WRITING THESES

TOPIC 1

IMPROVING PASSWORD SECURITY USING TWO-FACTOR AUTHENTICATION

ПОКРАЩЕННЯ БЕЗПЕКИ ПАРОЛЯ ЗА ДОПОМОГОЮ ДВОФАКТОРНОЇ АВТЕНТИФІКАЦІЇ

Ключові слова: безпека паролем, двофакторна автентифікація (2FA), автентифікація користувача, контроль доступу, кібербезпека, перевірка особи, системи входу, захист методом грубої сили.

Key words: password security, two-factor authentication (2FA), user authentication, access control, cybersecurity, identity verification, login systems, brute-force protection.

Аннотація (Abstract):

This thesis explores the effectiveness of two-factor authentication (2FA) as a method to improve password security in modern authentication systems. The study analyzes common vulnerabilities in password-only login systems and evaluates how adding a second authentication factor – such as a code sent to a mobile device – can reduce the risk of unauthorized access. Practical recommendations are provided for implementing 2FA in both personal and organizational settings.

Мета дослідження (Research Objective/The Objective of the Research):

To evaluate how two-factor authentication enhances password security and to

propose practical solutions for integrating 2FA into existing login systems to reduce cybersecurity threats.

TOPIC 2

PROTECTING PERSONAL DATA IN PUBLIC WI-FI NETWORKS

ЗАХИСТ ПЕРСОНАЛЬНИХ ДАНИХ У ПУБЛІЧНИХ МЕРЕЖАХ WI-FI

Ключові слова: захист персональних даних, публічний Wi-Fi, мережева безпека, шифрування даних, атаки типу «людина посередині», конфіденційність користувачів, безпека бездротового зв'язку, незахищені мережі.

Key words: personal data protection, Public Wi-Fi, network security, data encryption, man-in-the-middle attacks, user privacy, wireless security, unsecured networks.

Аннотація (Abstract):

Public Wi-Fi networks are convenient but often pose significant risks to personal data. This thesis investigates the security vulnerabilities commonly found in public wireless networks and the techniques attackers use to intercept user data, such as man-in-the-middle attacks. The study proposes best practices for users and technical solutions – such as VPNs and encryption – to enhance personal data protection when using open networks.

Мета дослідження (Research Objective/The Objective of the Research):

To identify key risks associated with using public Wi-Fi networks and to develop guidelines and technical strategies for protecting personal data from unauthorized access.

VII СПИСОК ДІЄСЛІВ ДЛЯ НАПИСАННЯ СТАТЕЙ ТА ТЕЗ

LIST OF VERBS FOR WRITING ARTICLES AND THESES

Common Academic Verbs (дієслова для наукових текстів)
To analyze – аналізувати – This paper analyzes recent threats...
To investigate – досліджувати –We investigate potential vulnerabilities...
To propose – пропонувати – We propose a new encryption algorithm...
To demonstrate – демонструвати – The results demonstrate a significant improvement...
To evaluate – оцінювати – The model was evaluated using real-world data...
To implement – реалізовувати – The system was implemented in Python...

To ensure – забезпечувати – This method ensures data integrity...
To mitigate – пом'якшувати, знижувати – The firewall helps mitigate external attacks...
To exploit – використовувати (шкідливо) – Hackers may exploit this vulnerability...
To address – усунути, торкнутися проблеми – This study addresses the lack of security in...

Useful Academic Phrases (сталі вирази)
According to recent studies… According to recent studies, phishing attacks are increasing. Згідно з останніми дослідженнями …
It is widely accepted that... It is widely accepted that encryption enhances security. Широко визнано, що...
There is a growing need for... There is a growing need for secure authentication methods. Існує зростаюча потреба в...
The aim of this study is to... The aim of this study is to analyze malware behavior. Мета даного дослідження ...
From a cybersecurity perspective… From a cybersecurity perspective, this system is vulnerable. З точки зору кібербезпеки
The results suggest that... The results suggest that the model is effective. Результати припускають, що...
In contrast to previous work … In contrast to previous work, our approach uses AI. На відміну від попередніх робіт
This raises the question of... This raises the question of how data should be stored. Це порушує питання про...

Core Technical Terms in Academic Context (технічні терміни у науковому мовленні)
Vulnerability – вразливість –This vulnerability can be exploited remotely.
Threat model – модель погроз/небезпек – We developed a comprehensive threat model.
Authentication – аутентифікація – Multi-factor authentication increases security.
Data integrity – цілісність даних – The algorithm ensures data integrity.
Confidentiality – конфіденційність – Encryption guarantees confidentiality.
Penetration testing – тестування на проникнення – Penetration testing revealed several issues.
Malware – шкідливе ПО – The malware was able to bypass the firewall.
Zero-day – вразливість нульового дня – A zero-day exploit was discovered.
Cyberattack – кібератака – The system suffered a large-scale cyberattack.
Intrusion detection – система виявлення вторгнень – We used an intrusion detection system (IDS).

Linking Words (сполучні слова)
Addition: Furthermore, in addition, moreover – крім того
Contrast: However, on the other hand, in contrast – однак, напроти

Cause and Effect: Therefore, as a result, consequently – отже
Clarification: In other words, that is to say – інакше кажучи
Example: for instance, such as, namely– наприклад
Conclusion: In conclusion, to sum up – наприкінці

Critical Thinking Vocabulary (лексика для аналізу та критики)
Assumption – припущення –This model relies on several assumptions.
Limitation – обмеження – One limitation of this approach is scalability.
Implication – наслідок, висновок – The implication of this finding is significant.
Bias – зсув, зміщення, упередженість – The dataset may contain bias.
Reliability – надійність – The system's reliability is yet to be tested.
Validity – вірогідність, достовірність – The results raise questions about the validity.

Приклади наукових фраз для есе, статей та виступів:
This paper presents a novel approach to… – Ця робота представляє новий підхід до...

Experimental results confirm the effectiveness of… – Експериментальні результати підтверджують ефективність...

One of the major contributions of this research is… – Один з основних внесків даного дослідження.

Security remains a major concern in the field of… – Безпека залишається основною проблемою у сфері.....

Further research is required to validate these findings. – Потрібні додаткові дослідження для підтвердження цих висновків.

VIII ТЕМИ ДЛЯ ЕСЕ

ESSAY TOPICS

1. Why Responsive Design Is Important in Modern Web Development?
2. The Differences Between Front-End and Back-End Development.
3. How Website Speed Affects User Experience?
4. The Role of HTML, CSS, and JavaScript in Building Websites.
5. Common Mistakes in Web Design and How to Avoid Them.
6. The Importance of Strong Password Policies in Preventing Cyber Attacks.
7. How Social Engineering Threatens Cybersecurity in Organizations?

8. The Role of Firewalls and Antivirus Software in Network Protection.

9. Why Employee Cybersecurity Training Is Essential for Every Company?

10. The Impact of Ransomware Attacks on Small and Medium Businesses.

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Базова

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ДОДАТКИ

APPENDICES

ДОДАТОК І

APPENDIX I

THE FAMOUS QUOTES OF EMINENT WRITERS AND POLITICIANS

1. «Getting information off the Internet is like taking a drink from a fire hydrant». ***Mitch Kapor***

2. «One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man». ***Elberd Hubbard***

3. «The real danger is not that computers will begin to think like meb, but men will begin to think like computers». ***Sydney Harris***

4. «The biggest risk is not taking any risk… In a world that's changing really quickly, the only strategy that is guaranteed to fail, is not taking risks». ***Mark Zuckerberg***

5. «If television is a babysitter, the Internet is a drunk librarian who won't shut up». ***Dorothy Gambrell***

6. «If you think technology can solve your security problems, then you don't understand the problems and you don't understand the technology». ***Bruce Schneier***

7. «Security is always excessive until it's not enough». ***Robbie Sinclair***

8. «There are only two types of companies: those that have been hacked and those that will be». ***Robert Mueller***

9. «The knock-on effect of a data breach can be devastating for a company. When customers start taking their business and their money elsewhere, that can be a real body blow». ***Christopher Graham***

10. «Cybercrime is the greatest threat to every company in the world». ***Ginni Rometty***

ДОДАТОК ІІ

APPENDIX II

Texts for Critical Thinking.

1. Name the keywords that convey the meaning of the text.
2. Describe the main idea of the text.
3. Specify the main fact on which the content is based.
4. Formulate the question that arises after reading.
5. Determine the general conclusion that follows from it.

Text № 1

Zero-Trust Security in Modern Systems

Zero-trust security is based on a straightforward principle: no user, device, or service is trusted automatically. Even if someone works inside the company network, every action must be verified. This approach helps reduce the impact of stolen passwords, infected devices, or unauthorized access attempts. Organizations use identity checks, multi-factor authentication, strict access limits, and continuous monitoring. Zero-trust is especially useful now, when many employees work remotely and access systems from different locations. By reviewing each request and giving every user only the access they truly need, companies create a safer and more controlled digital environment. This model does not eliminate all risks but significantly slows attackers and makes it harder for them to move through internal systems.

Text № 2

Machine Learning in Intrusion Detection

Machine learning improves intrusion detection by learning how normal network behavior looks and noticing when something unusual happens. Traditional detection systems depend on known attack signatures, so they often miss new threats. ML analyzes traffic patterns, user habits, system logs, and historical data to detect unusual actions that might indicate a breach. Over time, these models adapt and become more accurate, reducing false alarms. This helps security teams focus on real issues rather than sorting through thousands of unimportant alerts. ML does not replace specialists, but it increases speed and efficiency, especially when attackers use fast-changing tactics.

Text № 3

Blockchain for Reliable Data Integrity

Blockchain technology protects data by organizing information into linked blocks that cannot be changed without affecting the entire chain. If someone tries to alter one block, the system detects it immediately. This makes blockchain useful not only for digital currency but also for protecting records in healthcare, finance, logistics, and government. Because all participants share the same synchronized copy of the ledger, it becomes difficult to hide unauthorized actions. Blockchain strengthens trust between parties and reduces the need for a central authority. Although the technology has limitations, such as slower processing speed, it offers strong protection for data that must remain accurate and unchanged.

Text № 4

Security Challenges of Hybrid Clouds

Hybrid cloud systems mix private infrastructure with public cloud services, giving organizations flexibility but also increasing security complexity. Different platforms may use different settings and security rules, which creates gaps attackers can exploit. One of the most common issues is misconfiguration, incorrect permissions, open storage areas, or exposed interfaces. To reduce these risks, companies use centralized identity management, encryption, unified monitoring tools, and regular audits. Clear internal rules and automated checks

help ensure consistency across all environments. As more companies adopt hybrid setups, proper coordination and ongoing visibility become essential for protecting sensitive data.

Text № 5

Quantum Computing and Encryption Risks

Quantum computing is still in development, but it already poses a potential threat to existing encryption methods. Classical encryption relies on math problems that regular computers cannot solve quickly. Quantum machines could solve some of these problems much faster, making today's encryption unsafe in the future. This is why researchers are creating new post-quantum algorithms that can resist attacks even from quantum computers. Governments, banks, and technology companies are beginning to test these new methods. Switching to quantum-safe encryption will take time and careful planning because it affects many systems. Getting ready now helps avoid problems when quantum technology becomes widely available.

Text № 6

Human Error as a Major Cyber Risk

Many security incidents happen because of simple mistakes. People click on phishing links, use weak passwords, or share information without checking. Attackers often rely on social engineering, focusing on the human factor rather than technical weaknesses. Training employees to recognize suspicious messages, verify unexpected requests, and follow safe online habits helps reduce risks. Tools like password managers and multi-factor authentication support safer behavior. Creating a culture where employees understand how their actions affect the organization is important. When people stay alert and careful, many attacks can be stopped before they cause damage.

Text № 7

Ethical Principles in Cybersecurity Work

Cybersecurity professionals often handle sensitive systems and potentially dangerous information. Because of this, ethical behavior is essential. When researchers find a vulnerability, they should notify the affected organization privately and give time to fix the issue before sharing details publicly. They must avoid causing harm, disrupting systems, or accessing unrelated data. Ethical rules

protect both the researchers and the organization. They also help maintain trust between all parties involved. As technology becomes more complex, following clear ethical guidelines remains a necessary part of responsible cybersecurity practice.

Text № 8

AI-Driven Threat Intelligence

Artificial intelligence helps process large amounts of security data quickly. Threat intelligence tools collect logs, network information, malware samples, and public reports from many sources. AI analyzes this data to identify patterns that might signal an attack. It can link events that seem unrelated at first and highlight threats that require immediate attention. This reduces the workload of security teams and speeds up decision-making. Although AI is not perfect and still requires human oversight, it greatly improves the ability to detect new and complex threats in fast-moving environments.

Text № 9

Secure Software Development Practices

Creating secure software requires attention from the beginning of development. Teams analyze potential risks, plan defense strategies, and use safe coding methods. Tools for static and dynamic testing help find weaknesses before the software is released. After deployment, systems must be monitored to ensure updates do not create new vulnerabilities. Building security into every stage of development results in more reliable applications and fewer long-term problems. This approach increases user trust and reduces the cost of fixing issues later.

Text № 10

Cyber Risk Assessment in Critical Infrastructure

Critical infrastructure, such as power grids, transportation systems, and communication networks, plays a major role in daily life. Because of this, any cyberattack on these systems can have serious consequences. Risk assessment helps identify weak points and understand which systems require the most protection. Organizations evaluate possible threats, study how failures would affect operations, and prepare response plans. They create backup systems, add monitoring tools, and communicate with government agencies to react quickly to emerging dangers. As infrastructure becomes more digital, regular assessment and strong security planning are necessary to keep services stable and safe.