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ESSENTIAL ENGLISH FOR IT STUDENTS. PART 2

УЧЕБНО-МЕТОДИЧЕСКОЕ ПОСОБИЕ

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UNIT 1. THE INTERNET

Task 1. Lead-in questions.

1. When do you think the Internet appeared?
2. How has the advent of the Internet changed our life?
3. How can we get access to the Internet? What types of Internet connections do you know?

Task 2. Translate the terms into Russian and give a definition in English:

a) attenuation of a signal
b) bandwidth
c) broadband access
d) cell sites
e) coaxial cable
f) copper twisted-pair cable
g) dial-up access
h) fiber-optic cable
i) Internet protocol suite
j) transceiver

Task 3. Read and translate text A. Answer the questions.

1. What does ADSL stand for? Why is this type of connection called asymmetric?
2. What is the difference between a dial-up connection and DSL?
3. What is the origin of the term *dial-up connection*?
4. What is the downside of cable Internet?
5. What types of wireless Internet connections are mentioned in the text?
6. How is data transferred over fiber-optic cables?
7. What equipment does one need to get access to the Internet through satellite systems?

TEXT A. How to get access to the Internet

DSL

Digital Subscriber Line (DSL) is a high-speed Internet connection, which utilizes the standard telephone lines, but allows digital signals to be carried rather than analogue. It allows the full bandwidth of the copper twisted-pair telephone cabling to be utilized. The DSL signal is pulled out from the phone line as it enters the premises and is wired separately to a DSL modem. DSL service can be delivered simultaneously

with wired telephone service through the same telephone line since DSL uses higher frequency bands for data transmission.

The most commonly installed DSL technology for Internet access is ADSL (Asymmetric Digital Subscriber Line). It is asymmetric because the download speed is faster than upload speed. DSL-based services are a low-cost option when compared to other solutions offering similar bandwidth, so they can be made available to customers at extremely competitive prices.

Although DSL makes use of telephone cabling, it should not be confused with the dial-up connection of yesteryear. A dial-up connection to the Internet was set up by dialing a phone number, hence the name. Since the same frequency is used to carry voice and data signals over the copper telephone wire, only one service could be provided at a time and it was impossible to use the phone to make calls and browse the Internet at the same time.

Cable Internet

Cable Internet is a form of broadband Internet access that uses the infrastructure of cable TV networks to provide Internet services. It is integrated into the cable television infrastructure analogously to DSL, which uses the existing telephone network. Since TV itself takes up only a small portion of the cable's bandwidth, it leaves room for Internet access to be provided through the same network.

First, your Internet Service Provider sends a data signal through the coaxial cable into your home — specifically, to a cable modem. The cable modem then connects to your computer and other devices via an Ethernet cable or through Wi-Fi network using a Wi-Fi router.

A cable connection is highly reliable and is not subject to outages due to storms, like satellite Internet. However, since residential cable Internet access is provided through shared bandwidth, which everyone in the neighborhood uses, the speed can be slower during peak usage hours when a lot of Internet users are online. This does not happen with a DSL network, which keeps a consistent Internet signal because each subscriber has their own dedicated line.

Fiber-optic Internet

Fiber-optic Internet uses fiber-optic cables instead of copper wires and it is incredibly fast. Those cables send data to and from a computer by harnessing the power of light and can carry data over long distances with low attenuation and distortion of the light signal. That light signal uses binary system to communicate with computers. The presence of light indicates a binary one and the absence of light indicates a binary

zero. Fiber-optic cables transfer data faster than copper wiring, which means faster load times and higher-quality streaming.

Wireless connection

The three wireless technologies widely used today are Wi-Fi, cellular and satellite Internet. Wi-Fi uses radio waves to wirelessly connect devices and is commonly applied for local area networking. To get access to the Internet, a device (a tablet or a smartphone) has to be connected over Wi-Fi to a wireless router.

Internet over Satellite usually allows a user to access the Net via a geostationary satellite that orbits the Earth. As signals must travel long distances from the Earth up to the satellite and back again, it may cause a delay between the request and the answer. However, modern technologies make it possible to minimize this latency. Thus, satellite Internet access can provide high-speed Internet where the conventional cable or DSL is either not available or not functioning well. To get access to the Internet, one needs a satellite dish for two-way (upload and download) data communications and a modem.

A cellular network is a communication network distributed over land areas called "cells". Each cell has at least one fixed-location transceiver, but more commonly, there are three cell sites. These base stations (cell towers) provide a cell with the network coverage, which can be used for transmission of voice and data. A cell typically uses a different set of frequencies from the neighboring cells to avoid interference and provide guaranteed service quality within each cell.

Task 4. Find English equivalents for the following words and expressions in the text:

a) одновременно
b) помещение
c) цифровой сигнал
d) конкурентные цены
e) дешёвый вариант
f) надёжный
g) стабильный/ устойчивый сигнал
h) выделенная линия
i) искажение сигнала
j) помехи

Task 5. Watch a video on different types of Internet access at [https://www.youtube.com/watch?v=qQYiwmamq38] and fill in the gaps in the sentences below.

1. Cable Internet is a _____ access technology that uses a cable modem with an _____ coaxial cable.
2. Internet Service Providers offer different packages that _____ in speed.

3. A modem with a Wi-Fi router combo is often referred to as a _____.
4. The _____ of the cable Internet is that you have to share a pool of bandwidth with your neighbors.
5. One shouldn't _____ DSL with the older and slower _____ _____which also uses phone lines.
6. Everyone using DSL has their own _____ connection, so you don't have to share bandwidth with your neighborhood.
7. The three types of DSL connections mentioned in the video are ADSL, _____ and _____.
8. Fiber-optic cable is used as the _____ of the Internet.
9. Signals in a copper cable can be affected by _____ _____ which can weaken the signal.

Task 6. Modify the word in brackets so that it fits the gap.

Bandwidth

Bandwidth is a term related to digital (1) _____ (*communicate*). In fact, bandwidth is (2) ____ (*synonym*) to the maximum rate of data transfer. It refers to the exact amount of data that can be carried between two points at a (3) _____ (*specify)* time period. (4) _____ (*general*), network bandwidth is expressed metrically in the form of bits per second. However, the modern networks measure their speeds in millions of bits every second, which is also (5) _____ (*refer)* to as megabits per second. (6) _____ (*similar)*, billions of bits every second are referred to as gigabits per second.

While understanding bandwidth, we should note that it is not the only vital factor that affects the (7) _____ (*perform)* of a digital network. Other relevant factors like data loss or latency issues may also affect the network and make it seem like a low-bandwidth issue. Bandwidth is highly significant for (8) _____ (*determine)* how fast a web page loads on a browser.

Task 7. Watch a video at [https://www.youtube.com/watch?v=x3c1ih2NJEg] explaining how the Internet works and answer the questions.

1. What problem can occur if the Internet signal is sent through a satellite?
2. What do domain names correspond to?
3. What makes the backbone of the Internet?

4. What sort of things does ICANN deal with?
5. What makes data transfer over the Internet efficient?

Task 8. Read the text and fill in the gaps with the word below:

ensures / piece / rerouted / includes / congestion / amount / broken down / destination / reliable / determined

In telecommunication, a packet is a small (1) _____ of data sent over a network, such as a LAN or the Internet. When a user sends a file across a network, it is not transferred as one (2) _____. In fact, it gets (3) _____ into smaller data packets and this technology (4) _____ reliable and efficient data transmission. So, if a data transfer encounters network (5) _____ due to multiple simultaneous transfers, some packets can be (6) _____ through a less congested path. When the packets reach their (7) _____, they are reassembled into a single file by the computer that receives them.

The packet size is typically (8) _____ by the type of protocol used. Ethernet packets can be around 1.5 KB, whereas IP packet average size is 64 KB. Similar to a real-life package having a source and destination, each network packet (9) _____ the origin IP address, the destination IP address, the number of packets in the entire data file, and the sequence number to guarantee the (10) _____ data transmission.

Task 9. Read and translate the text into Russian.

TEXT B. Circuit switching vs. Packet switching

Circuit switching is a connection-oriented approach of transferring data units across a network where two network nodes establish a dedicated connection channel before the communication session starts. This approach to data transmission is a three-step procedure that includes connection making, data transferring, and connection removing. In circuit switching, data is not divided into units, so the complete data is to be transmitted through the same route. Circuit switching is mainly utilized in public switched telephone networks. Once you build the circuit, it is in place until you tear it down. So, no other devices can use this path while it’s reserved even if it’s idle, which leads to a waste of bandwidth.

Packet switching refers to a technique where data is divided into multiple units called packets. Each packet consists of two main parts: the header and the payload. The

header includes the routing information while the payload contains the data that is to be transferred. A good example of a packet-switched network is the Internet.

There are two different approaches used for packet switching: datagram packet switching and virtual circuit switching. In datagram packet switching technique, there is no dedicated channel for data transmission and packets can be routed individually through different paths. The packets are later reassembled in the original order based on the sequence number of each packet. The major advantage of this technology is that it provides a more efficient use of Internet bandwidth.

Virtual circuit switching is a connection-oriented technique that combines the characteristics of circuit switching and datagram packet switching. In this type of packet switching technology, a virtual connection is first established between the source and destination and the packets are then routed along this path sequentially.

Task 10. Watch a video at [https://www.youtube.com/watch?v=VjqiHLGO2p0] and fill in the gaps in the sentences below.

1. We're not able to talk to anyone else or make any other phone calls until we _____ ___ with that connection and then we establish a new _____ to someone else.
2. A waste of resources is one of the _____ with circuit switching.
3. ISDN is a bit of an _____ from the telephone, but it is still dialing a phone number and creating a circuit.
4. Usually the media of packet switched network is _____ by many people.
5. Internet Service Providers generally _____ us based on how much _____ we're going to use.
6. It's _____ to see the older circuit switched networks being phased out and everyone migrating to the faster and much more _____ packet switched networks.

Task 11. Read and translate text C. Then answer the questions to the text.

TEXT C. The TCP/IP model

TCP/IP is a stack of protocols used to interconnect network devices on the Internet. The entire Internet Protocol Suite is commonly known as TCP/IP because the foundational protocols in the suite are the Transmission Control Protocol (TCP) and the Internet Protocol (IP). TCP/IP specifies how data is exchanged over the Internet and how it should be broken into packets, addressed, routed and received at the destination. The TCP/IP model is widely used today and is compatible with all operating systems and all types of computer hardware.

The protocols of the TCP/IP stack are split into four layers. The **Application layer** is the topmost layer in the TCP/IP stack and it includes the protocols used by most applications for providing user services or exchanging data over the network. The most common protocols are HTTP (Hypertext Transfer Protocol) which governs the work of web browsers and websites, FTP (File Transfer Protocol) that handles transmission of files between computers and SMTP (Simple Mail Transfer Protocol) used for emails.

The next layer down is called the **Transport layer**. It performs host-to-host communication, providing a channel for data transmission between devices. The transport layer protocols include TCP and UDP (User Datagram Protocol). Transmission Control Protocol guarantees the delivery of data through an acknowledgement and ensures the transmission of missing packets if needed. Unlike TCP, UDP does not verify the connection between the receiving and sending hosts. This protocol is used when we need real-time communication, for example when making phone calls.

The **Internet layer** includes the protocols which are responsible for the logical transmission of data over the entire network. The primary protocol of this layer is Internet Protocol (IP) which defines how to address and route each data packet to make sure it reaches the right destination. To this end, both the origin and destination IP addresses are attached to the packet. Each gateway computer on the network checks the IP address to determine where to forward the message.

The bottom layer of the TCP/IP model is **the Network Interface layer**. It includes the protocols required to deliver data across some physical medium. The best-known protocol of this layer is Ethernet, which is frequently used in LAN environments, such as offices, homes, and universities.

1. What are the most common protocols of the application layer?
2. At which layer does TCP work?
3. What does UDP stand for?
4. What is the difference between TCP and UDP?
5. What information does IP header contain?

***Task 12. Fill in the gaps with prepositions*:**

of / to / as / at / of / over

1. Data is transmitted in small chunks called packets so that they can individually take the quickest route ____ the Internet to reach their final destinations.
2. Satellite Internet providers have the advantage ____ being available in areas where cable, fiber, and even phone lines don't reach.
3. The OSI model has seven layers compared ____ four layers of the TCP/IP model.
4. The switches usually operate ____ data link layer.
5. The TCP/IP model can be used _____ a reference to help understand how networks operate.
6. The key responsibility ____ physical layer is to carry the data across physical channels.

Task 13. Fill in the gaps in the text and answer the questions.

The World Wide Web

accessed / referred / hyperlinks / a set of instructions / synonymous / click / scientist / web browser / up-to-date / everyday / outside

The World Wide Web (WWW), commonly (1) _____ to as the Web, is an information system accessible through the Internet where documents and other web resources are identified by a Uniform Resource Locator (URL). The resources of the Web can be (2) _____ through a software application called a web browser. The Web is a hypertext-based system (hypertext is a text that contains (3) _____ to other documents). You can (4) _____ on keywords or buttons that take you to other pages or other websites. This is possible because browsers understand Hypertext Markup Language (HTML), (5) _____ used to indicate how a web page is formatted and displayed.

The World Wide Web is not (6) _____ with the Internet, which pre-existed the Web and upon which the Web is built. English (7) _____ Tim Berners-Lee invented the World Wide Web in 1989. He wrote the first (8) _____ in 1990 while employed at CERN near Geneva, Switzerland. The browser was released (9) _____ CERN to other research institutions in January 1991, and then to the general public in August 1991. The Web began to enter (10) _____ use in 1993/ 1994, when websites for general use started to become available. Nowadays the Web serves billions of users worldwide, as it is one of the best resources for (11) _____ information.

1) What does URL stand for?
2) Who invented the World Wide Web?
3) When did the Web enter everyday use?
4) What does HTML stand for? What is this language used for?

Task 14. Translate the following sentences from Russian into English.

1. Спутниковый Интернет является хорошим решением для сельских районов, где нет телефонных линий.
2. Технология Wi-Fi использует радиоволны, чтобы передавать сигнал.
3. Технологии доступа к Интернету постоянно меняются и совершенствуются.
4. Модем преобразовывает цифровой сигнал в аналоговый и наоборот, чтобы данные можно было передать по телефонным линиям.
5. Цифровая абонентская линия является более быстрым вариантом доступа к Интернету, чем коммутируемый доступ.
6. Сотовая сеть использует специальные базовые станции для передачи сигнала.
7. Всемирная паутина является одним из лучших источников последней информации.
8. Оптоволоконный кабель имеет значительные преимущества по сравнению с медным проводом.
9. Протокол передачи файлов (FTP) был разработан для передачи данных между клиентом и сервером.

Task 15. Fill in the gaps with the correct prepositions:

with / between / through / of / into / with / by

1. DSL service can be delivered simultaneously _____ wired telephone service over the same telephone line.
2. The Internet is a worldwide computer network that transmits a variety _____ data and media across interconnected devices.
3. An IP address is a series of four numbers separated _____ dots, for example: 192.168.2.10.
4. TCP/ IP specifies how data is exchanged over the Internet and how it should be broken down _____ packets, transmitted, and received at the destination.

5. Transmission Control Protocol guarantees the delivery of data _____ an acknowledgement.
6. Different types of fiber-optic cables are used for long distance telecommunication, or for providing a high-speed data connection _____ different parts of a building.
7. TCP/ IP Protocol Stack is compatible _____ all operating systems and all types of computer hardware.

Task 16. Match the terms with their definitions:

satellite connection / DSL / fiber-optic technology / IP address / cellular network / packet switching / Wi-Fi / dial-up connection / WWW / bandwidth / cable Internet

1. A broadband communication technology designed for the use on telephone lines; it allows a single phone connection to be used for both Internet service and voice calls at the same time.
2. A numerical label assigned to every device in a network that uses the Internet.
3. The fastest wired way to access the Internet transmitting information as pulses of light through strands of fiber made of glass or plastic over long distances.
4. A network of documents that works in a hypertext environment, i.e. using text that contains links to other documents.
5. A high-speed broadband access using a coaxial cable to transmit data.
6. The quantity of data that can be transmitted through a network, measured in bits per second.
7. The least expensive but also the slowest way to access the Internet which uses a standard phone line and analog modem. This technology pre-existed the DSL connection.
8. A radio network distributed over land areas called cells, each served by a fixed-location transceiver, known as a cell tower.
9. An Internet access technology that is considered an alternative to terrestrial communications.
10. A technology allowing huge files to get broken down into smaller data chunks, not transferred in one piece, which ensures reliable and efficient data transmission.
11. A high-speed Internet connection operating over LAN without the use of any cables and whose essential elements are radio signals and a wireless router.

UNIT 2. SEARCH ENGINES

Task 1. Lead-in questions.

1. What is a search engine? What is its function?
2. What are the most popular search engines these days?
3. Why do you think some people choose to use alternative search engines to *Google* and *Yandex*?

Task 2. Translate the terms into Russian and give a definition in English:

a) bookmark
b) homepage
c) keywords
d) relevant results
e) search bar
f) search engine
g) tab
h) to surf the web
i) URL
j) web browser

Task 3. Read text A and use the words given in brackets to form a word that fits in the gaps. Then translate the text into Russian.

TEXT A. Types of Search Engines

A search engine allows users to extract (1) _____ *(request)* information from the huge database of resources available on the Internet. Internet usage has increased (2) _____ *(tremendous)* in the recent years with the easy to use search engines like *Google*, *Bing* and *Yahoo!* (3) _____ *(optimize)* websites for *Google* and other search engines is essential for any website owner if they want to reach a larger audience. Studies suggest that when using search engines, most people do not go beyond the listings (4) ____ *(mention)* on the first couple of pages of the search engine results list.

Search engines can be classified into the following three categories:

1) crawler-based search engines
2) human-powered directories
3) meta-search engines.

1. Crawler-Based Search Engines

There are three basic steps that every crawler-based search engine follows before (5) _____ *(display)* search results:

- crawling
- indexing
- ranking

Crawling

Crawler-based search engines create their listings (6) _____ *(automatic)* by using a special program known as 'a crawler' or 'a spider' to find new and (7) _____ *(update)* content. Content can vary – it could be a webpage, an image, a video – but (8) _____ *(regard)* of the format, content is discovered by links. For example, *Googlebot* starts out by (9) _____ *(fetch)* a few webpages and then follows the links on those webpages to find new URLs. Various data mining techniques are used to define which pages should be crawled and the crawling (10) _____ *(frequent).* Every time a web crawler finds a new website through a link, it scans and passes its content for further processing (called indexing).

Indexing

Search engines process and store information they find in an index - a massive database of discovered URLs – to be retrieved later when a user enters a query. Indexing is performed by (11) _____ *(identify)* the words and expressions that best describe the page. The (12) _____ *(identify)* words are referred to as keywords and the page is assigned to the identified keywords.

Ranking

Search engines compare the search string with the indexed pages from the database to provide the content that will best answer the user's query. The results are ordered from most relevant to least relevant. This ordering of search results by (13) _____ *(relevant)* is known as ranking. There are various algorithms to calculate (14) _____ (*relevant),* which is why different search engines give different search results for the same search string. These algorithms are (15) _____ *(constant)* evolving to provide users with most relevant search results.

2. Human-Powered Directories

Human-powered directories depend on human editors to compile their listings. This means that they only show results for content that is added (16) _____ *(manual).* There are three basic steps to take.

- A short description along with the URL of the website is submitted to the directory for (17) _____ *(approve)*.

- Submitted site is then manually reviewed and added in the appropriate category or rejected for listing.
- Keywords entered in the search box will be matched with the (18) _____ *(describe)* of the site. This means that changes made to the content of a webpage are not taken into consideration as it is only the description that matters.

Yahoo! Directory, Open Directory and *LookSmart* can serve as good examples of web directories. However, automated search engines like *Google*, have (19) _____ *(near)* wiped out those human-based directories out of the web.

3. Meta-Search Engines

A meta-search engine does not have a database of indexed pages of its own. Instead, it sends users' queries to several other search engines and compiles top results from each into one overall list. After redundancy (20) _____ *(remove)*, these results are processed, ranked and presented to the user. *Dogpile, MetaCrawler,* and *SavvySearch* are a few examples of such meta-search engines.

Task 4. Find the English equivalents to these word combinations in the text:

a) доступный в Интернете
b) перейти по ссылке
c) дальнейшая обработка
d) добавить вручную
e) ключевые слова
f) запрос пользователя
g) поисковая строка
h) иметь значение
i) соответствующая категория
j) принимать во внимание

Task 5. You are going to watch a video on search engines. Match the verbs (1-6) with the nouns or phrases (a-f) to make collocations, then watch the video at [https://www.youtube.com/watch?v=LVV_93mBfSU] and check your answers:

1) lead
2) collect
3) come up
4) update
5) rank
6) narrow down
a) with results
b) algorithms
c) a team
d) web pages
e) one's search
f) information

Task 6. Watch the video again and fill in the gaps with the missing words or phrases.

1. Let's ____ ___and see how the search engine turns your _____ into a result. To make your search faster, search engines are constantly _____ the Web in advance to record information that might help with your search later.
2. Search engines are constantly running a program called *a spider* that _____ through web pages following hyperlinks. The information this program collects is added to a special database called _____ _____.
3. Each search engine uses its own algorithm to rank the pages _____ ___ what it thinks you want. The search engine ranking algorithm might check if your search term shows up in the page _____ or it might check if all the words show up ____ ____ ____ ____.
4. *Google* invented an algorithm that takes into _____ how many other web pages are linked to a _____ page.
5. Search programs are always _____ to improve the algorithm so that they return better and faster results than their _____.

Task 7. Read the text below and fill in the gaps with the most suitable words or phrases from the list.

TEXT B. What are the alternatives to Google?

Google is a globally recognized search engine and an industry giant. But even if it's the biggest and most well-known, it doesn't mean it's your only choice. One of the main reasons that people choose to use an alternative search engine instead is for increased privacy, as *Google* is known to track user data both for its own and third-party use.

Bing

internal features / pretty handy / versatile tool / catch up

Microsoft's Bing has become an alternative search engine option for many people today. It's easy to use and provides beautiful background photos. Just like *Google, Bing* is full of (1) _____ like currency conversion, translation, and flight tracking, making it a really (2) _____ that holds its niche in the global market. While you're likely familiar with *Bing*, you might not know that it offers a Rewards

scheme. When you shop or search through *Bing*, you earn points that can be put towards purchasing apps and movies, which is (3) _____. *Bing* has recently been trying to (4) _____ with *Google* in the advertising space, adding a number of features to *Bing Ads*. While *Bing* doesn't have the market share that *Google* does, it is still popular in many markets including the U.S. and the U.K.

Baidu

censored / was founded / similar to / per day / downside

Baidu (5) _____ in 2000 and is the dominant search engine in China with a market share of over 70 percent. Although in Mandarin, it is strikingly (6) _____ *Google* in terms of design. However, *Baidu* is heavily (7) _____. Certain images and even pro-democracy websites are blocked on the search engine. Outside of China, *Baidu* holds little influence. But within the country, *Baidu* powers 3.3 billion searches (8) _____.

The (9) _____ to *Baidu* is that it only gives access to one market. The upside is that the market it gives access to is huge. That said, it's crucial for businesses to understand that accessing the Chinese market is not like accessing any other. The visuals, verbiage and customs are entirely different and *Google Translate* isn't going to help you win any customers over. To access the Chinese market via *Baidu*, you need someone on staff who speaks the language and understands the culture.

Yandex

went public / holds / user-friendly / was adopted

Yandex is used extensively in its native Russia, where it (10) _____ around 60% of the search engine market share. It provides a very similar service to *Google*, and you can search websites, images, videos, and news in a (11) _____ layout. It also has additional features including mobile apps, maps, translation, cloud storage and more.

Yandex has its roots in a project started by two Russian developers to aid in the classification of patents in 1990. The term *Yandex* (12) _____ in 1993 standing for "**Y**et **A**nother i**NDEX**er." The Yandex.ru domain was launched in 1997. In 2011, they (13) _____ on the New York Stock Exchange with an IPO (initial public

offering) of $1.3 billion making it the second largest at the time (right after *Google*). *Yandex* currently powers more than half of all searches in Russia.

Ecosia

towards / renewable energy / on average

Heavy search engine usage has a considerable impact on CO_2 emissions. That is where *Ecosia* comes in: the CO_2 neutral alternative search engine. Their servers run on 100% (14) _____ and they use their profit to plant trees. About 80% of their ads revenue goes (15) _____ the tree-planting scheme. (16) _____, roughly 45 searches are needed to plant a single tree.

Search Encrypt

erases / be tracked / encryption

Search Encrypt is a privacy-based search engine, which uses (17) _____ to ensure that users' identifiable information cannot (18) _____. As a metasearch engine, *Search Encrypt* gets its results from a network of search partners, providing well-rounded results that aren't personalized to your history. A really interesting feature of this search engine is that it automatically (19) _____ your local browsing history after 15 minutes of inactivity. This means that you never have to worry about your privacy, even if someone else has access to your computer.

Task 8. Translate the sentences into English.

1. Разные поисковые системы используют разные алгоритмы для сбора и обработки информации, размещенной в сети.
2. Метапоисковая система – это поисковый инструмент, посылающий запрос пользователя одновременно в несколько поисковых систем и каталогов.
3. Собрав результаты, метапоисковая система удаляет ссылки, которые дублируются, и ранжирует результаты поиска в соответствии с применяемым алгоритмом.
4. Некоторые люди предпочитают использовать поисковые системы, которые обеспечивают наибольшую конфиденциальность.

5. Поисковые системы ежедневно проводят рутинную работу по поиску, хранению и сортировке информации.
6. Индексация – это процесс занесения информации в базу данных поисковых систем.
7. Введя один и тот же запрос в поисковые строки разных поисковиков, можно получить разные ответы.

Task 9. Watch a video on the difference between a search engine and a web browser at [https://www.youtube.com/watch?v=axWqq-IkdVg] and fill in the gaps below.

1. Unlike a search engine that operates on remote servers, a web browser runs _____ on your hardware.
2. When you enter a _____ address, a web browser decodes that address and puts it into a series of _____, so the computer can route traffic to various servers.
3. Besides, a web browser reads the computer code of a website and then _____ it on the screen.
4. After a user enters a request, a search engine will look across all the websites it can _____ ____to.
5. With a web browser, a user just points at one _____ website while with a search engine, a user is given a list of potential places one can go to.

Task 10. Put the paragraphs below in the correct order to make a text.

TEXT C. How web browsers work

a. That means they are the same in every website, which allows your web browser to view so many different types of content.

So, let us see what happens when you visit a website. At the top of every browser there is an address bar where you can type in the site you want to visit. When you hit the enter button, a chain of actions takes place.

b. By offering web browsers, they are able to gently sculpt your computing habits and make their other money-making products more attractive.

Now let us have a look at how a web browser works. You can get access to multiple websites because there are some standard protocols and procedures.

c. The client sends a request to the server asking if it is open for new connections. If the server is ready to accept a connection, it will acknowledge the request and then, finally, the client sends one more message acknowledging it received the server's acknowledgement.

d. Nowadays, anyone can surf the web, which is a subset of the Internet, using a web browser, like *Google Chrome*, *Firefox* or *Microsoft Edge*. Companies typically make free web browsers because they have financial interest in how you use their Internet-connected products.

e. First, a web browser has to find the location of a server where the website you want to visit is stored. If fact, a domain name, like *youtube.com*, represents an IP address. So, the browser then uses a database called the Domain Name System (DNS) to match the domain name you typed in to the corresponding IP address. Next the computer (called the client) and the server where the website is stored establish a connection with each other over the Transmission Control Protocol (TCP).

f. Now that the connection is established, the client can request web pages over HTTP (Hypertext Transfer Protocol). After receiving the request, the server will go through databases and storage devices to find the information you want and create a response. The response is usually built using HTML (Hypertext Markup Language), which makes the basic building blocks of every website. Finally, the web browser downloads the web page to your computer.

Task 11. Match the terms with their definitions:

search engine / crawler / browser / hyperlink /
URL / ranking / search bar / index / query

1. A special program also known as *a spider* that finds new and updated content.
2. A massive database of discovered URLs.
3. A program that allows users to extract requested information from the huge database of resources available on the Internet.
4. The address of a file on the Internet.
5. A request that a user enters into a search box.
6. A computer program with a graphical user interface for displaying and navigating between web pages.

7. A field on the screen that accepts typed-in text in order to look up something or launch a search.
8. Ordering results from most relevant to least relevant.
9. A highlighted word or image in a hypertext document that takes a user to another location when he/she clicks on it.

Task 12. Listen to the recording and fill in the gaps in the text below. Audio file 2.1 [https://online-edu.mirea.ru/course/view.php?id=7376]

Using the Compunet Browser

The first step to using the Compunet browser is (1) ___ _____ the application. Locate the browser icon and click it. The browser will open to its (2) _____. The homepage will be the Compunet website. You can change this to any site you (3) _____. At the top of the browser, you will see the address bar. It displays (4) ___ ____ of the webpage that is open. To find a different webpage, locate the search bar. Enter (5) ____ ____ about the idea or pages you are looking for.

The webpages you visit are saved in the browser (6) _____. Cookies will also be stored. These two features help load websites faster. You can save any page you visit frequently as (7) _____. Then you won't have to type in the URLs any more. Compunet's browser can open multiple (8) _____. But remember that opening too many tabs can (9) _____ with proper functioning. Add-ons are also available to increase the functionality of the browser.

UNIT 3. PROGRAMMING LANGUAGES

Task 1. Lead-in questions.

1. How do you think we can classify programming languages?
2. What are the most common programming languages nowadays?
3. What programming languages are rarely used these days?

Task 2. Translate the terms into Russian and give a definition in English:

a) applet
b) assembler
c) compiler
d) cross-platform
e) encapsulation
f) inheritance
g) interpreter
h) machine code
i) object-oriented programming
j) polymorphism
k) program maintenance
l) source code

Task 3. Read the text below and put the following sentences in the appropriate place. Then listen to the recording and check your answers. Audio file 3.1 [https://online-edu.mirea.ru/course/view.php?id=7376]

1. A compiler is a software component that translates human-readable language into an assembly language.
2. They write software in human-readable programming languages.
3. The computer uses these instructions to perform the command.
4. Computers have their own language, called machine language.

TEXT A. How computers process information

Computers are constantly processing large amounts of information. Operating a computer involves sending and receiving complex sets of instructions. Machine language is made up of binary digits that are represented by the numbers 0 and 1. Every possible computer operation is encoded with different combinations of these two numbers.

However, programmers usually do not send commands in machine language. This allows programmers to write software quickly and efficiently. These languages,

like C and Java, are more compatible with the way humans think. However, computers still require instructions in machine language.

Systems software facilitates this communication within the computer. This language is simpler than a human-readable language, but it still uses letters and words. The computer needs an assembler to turn those instructions into the binary translation.

For example, the programmer might write the command "A + B." Then, a compiler converts it into an assembly language: "Add A, B." Finally, an assembler translates it into machine code: "1000110010100000".

Task 4. Read text B. Translate it into Russian and answer the questions below.

1. What is the difference between high-level and low-level programming languages?
2. What is the difference between the assembler, compiler, and interpreter?
3. Which language is widely used for systems programming?
4. What does FORTRAN stand for?
5. What are Java applets?

TEXT B. Programming languages

Unfortunately for us, computers can't understand spoken English or any other natural language. The only language they can understand directly is machine code, which consists of 1s and 0s (binary code).

However, machine code is too difficult to write. For this reason, we use symbolic languages to communicate instructions to the computer. For example, assembly languages use abbreviations such as ADD, SUB, MUL to represent instructions. The program is then translated into machine code by a piece of software called an assembler. Machine code and assembly languages are called low-level languages because they are closer to the hardware. They are quite complex and restricted to particular machines. To make the programs easier to write, and to overcome the problem of intercommunication between different types of computer, software developers designed high-level languages, which are closer to the English language. Here are some examples.

FORTRAN (FORmula **TRAN**slator) was one of the first high-level programming languages designed by IBM in mid-1950s for scientific and engineering computations. It introduced the concept of high-level abstraction allowing programmers to write a code closer to human language.

BASIC (**B**eginner's **A**ll-purpose **S**ymbolic **I**nstruction **C**ode) was designed in the 1960s to be a simple language for beginners. It played a significant role in bringing programming to a wider audience.

PASCAL (named after French mathematician Blaise Pascal) became popular in the 1970s. Since that time, it has been widely used for teaching the beginners the fundamentals of programming.

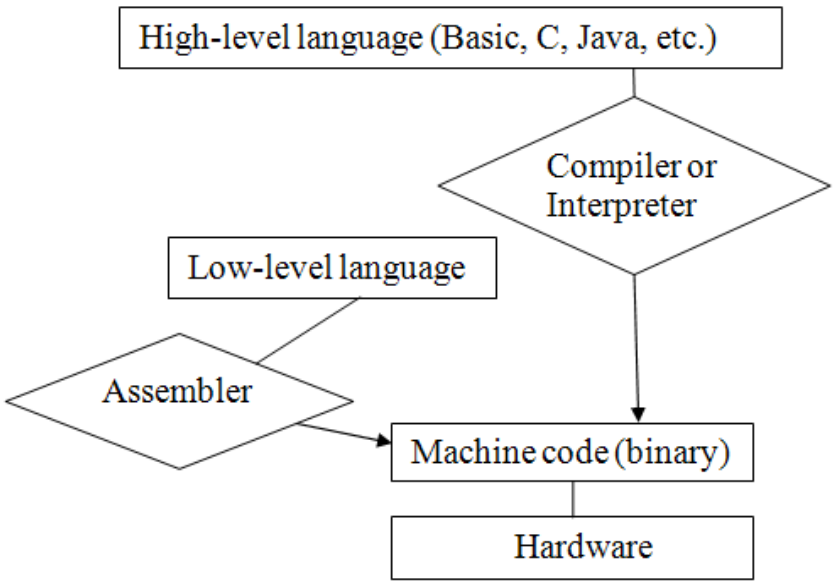
C was developed in the 1970s by Dennis Ritchie at Bell Labs. It combined low-level control with high-level abstraction, making it suitable for systems programming.

C++ is an extension of the **C** which incorporates object-oriented programming. The programmer concentrates on particular things (a piece of text or graphics) and gives each object functions, which can be altered without changing the entire program. This makes programs easier to modify.

Java was designed at Sun Microsystems in 1995 to run on the Web. It was widely used to create Java applets – small programs that provide animation, and interactive features to web pages. Java was designed to be platform-independent, using the "Write Once, Run Anywhere" principle. It introduced the concept of the Java Virtual Machine (JVM) and popularized object-oriented programming.

Python was created in 1989 and emphasized code readability and simplicity. Python has become popular for various applications, including web development, data analysis, and artificial intelligence.

Programs written in high-level languages must be translated into machine code by a compiler or an interpreter. A compiler translates the source code into object code - that is, it converts the entire program into machine code in one go. On the other hand, an interpreter translates the source code line by line as the program is running.



Task 5. Complete the text below with the missing prepositions.

TEXT C. High-level and low-level programming languages

Programming languages can be divided (1) ____ two classes: high-level languages or low-level languages. Each type of programming language has its own purpose and learning the difference (2) _____ the two is an important step to figuring (3) ____ which one to use. Whether a language is high-level or low-level has to do (4) ____ abstraction. The amount (5) ____ abstraction provided defines how 'high-level' a programming language is.

Machine code has no abstraction. It is a strictly numerical language and consists (6) _____ individual instructions passed to a computer. Machine code is what computers actually run. Any other code, written (7) _____ an assembly language or high-level language, must be translated (8) _____ machine code for it to be executed on a computer.

Assembly language is another low-level language that is a step (9) _____ machine code and it features very small amount of abstraction. (10) _____ machine code, assembly languages are specific (11) ____ hardware, so every assembly language is designed (12) _____ a particular computer architecture. Assembly code is converted (13) ____ executable machine code by a program referred (14) _____ as an assembler. Together machine code and assembly languages form the low-level category.

High-level languages are closer (15) _____ ordinary languages, but each of them has its own syntax, and you might find that some are easier to read than others. They have high level (16) _____ abstraction and are portable, meaning they can be executed on many computers, i.e. you don't need to write hardware specific code, like you do with low-level languages. These languages are good for writing software programs, web apps, and mobile apps. For instance, C# is a good example (17) _____ a multi-purpose language, JavaScript is the backbone (18) _____ web coding, and SQL is great (19) ____ database programming.

Task 6. You are going to watch a video on the five most popular programming languages at [https://www.youtube.com/watch?v=vzk5DCFJr8c]. Guess how the programming languages would be ranked. Check your ideas, answer the question.

JavaScript / C and C++ / Swift / Python / Java

1. What programming language had been extensively used by *Apple* before *Swift* was developed?
2. What programming language is titled ‘the mother of all programming languages’?
3. What programming language has changed the face of the Internet?
4. What is good about Java?
5. What is a common misconception about Python?
6. Which distinctive features of Python are emphasized in the video?

Task 7. Read and translate text D. Answer the questions to the text.

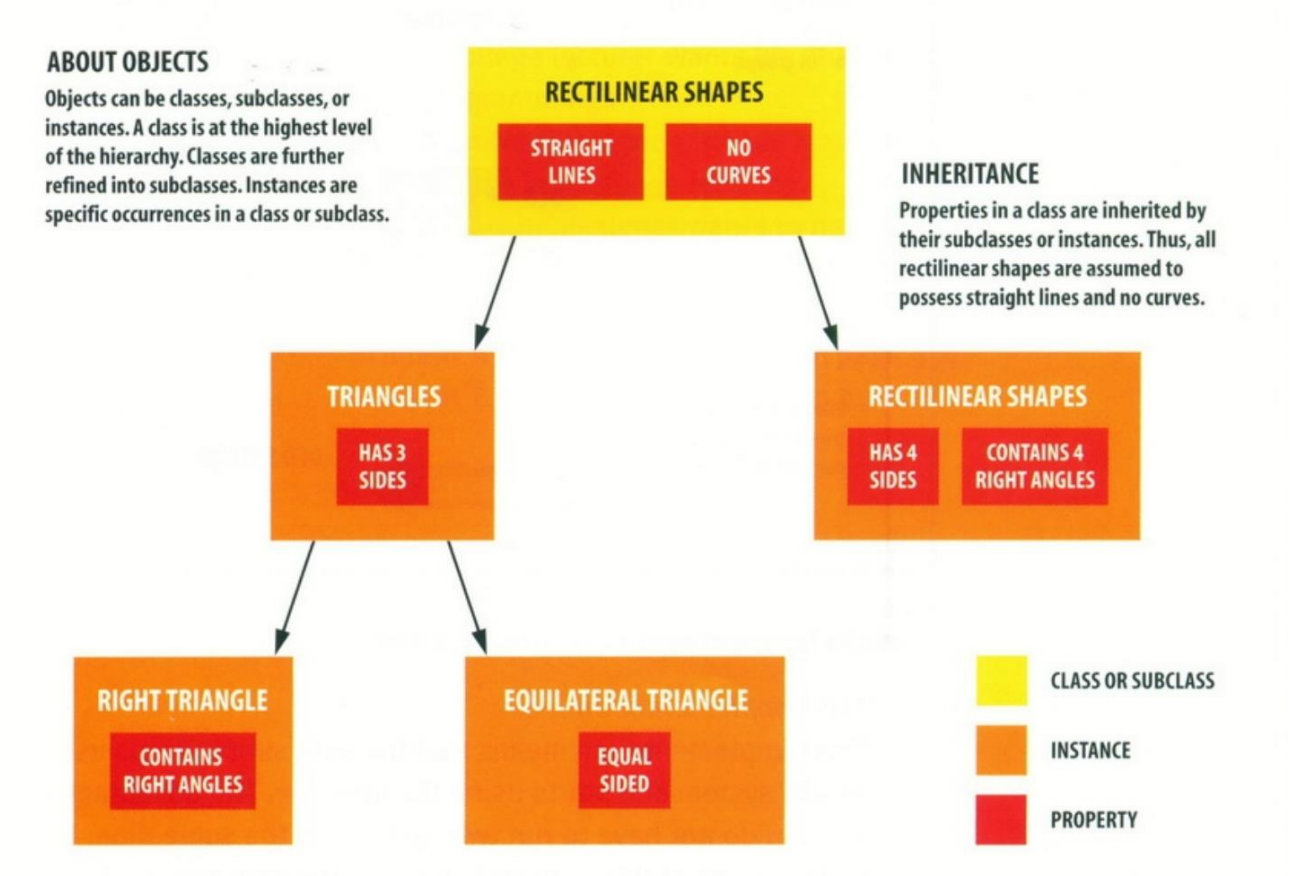
1. What are the advantages of using object-oriented programming?
2. What are the three key features of OOP?
3. What is encapsulation?
4. What is inheritance?
5. What is polymorphism?
6. What multimedia data types are referred to in the text?
7. List the different types of triangle mentioned in the text.
8. What specific type of rectangle is named in the text?
9. What common properties of a rectangle are mentioned in the text?
10. What can be made quicker by code reusability?

TEXT D. Object-Oriented Programming

One of the principal motivations for using OOP is to handle multimedia applications in which such diverse data types as sound and video can be packaged together into executable modules. Another is writing program code that's more intuitive and reusable; in other words, code that shortens program-development time.

Perhaps the key feature of OOP is **encapsulation** - bundling data and program instructions into modules called 'objects'. Here's an example of how objects work. An icon on a display screen might be called 'Triangles'. When the user selects the Triangles icon - which is an object composed of the properties of triangles (see the picture below) and other data and instructions - a menu might appear on the screen offering several choices. The choices may be (1) create a new triangle and (2) fetch a triangle already in storage. The menu, too, is an object, as are the choices on it. Each time a user selects an object, instructions inside the object are executed with whatever properties or data the object holds, to get to the next step. For instance, when the user wants to create a

triangle, the application might execute a set of instructions that displays several types of triangles - right, equilateral, isosceles, and so on.



Many industry observers feel that the encapsulation feature of OOP is the natural tool for complex applications in which speech and moving images are integrated with text and graphics. With moving images and voice built into the objects themselves, program developers avoid the sticky problem of deciding how each separate type of data is to be integrated and synchronized into a working whole.

A second key feature of OOP is **inheritance**. This allows OOP developers to define one class of objects, say 'Rectangles', and a specific instance of this class, say 'Squares' (a rectangle with equal sides). Thus, all properties of rectangles - 'Has 4 sides' and 'Contains 4 right angles' - are automatically inherited by Squares.

A third principle behind OOP is **polymorphism**. This means that different objects can receive the same instructions but deal with them in different ways. For instance, consider again the triangles example. If the user right clicks the mouse on 'Right triangle', a voice clip might explain the properties of right triangles. However, if the mouse is right clicked on 'Equilateral triangle' the voice instead explains properties of equilateral triangles.

The combination of encapsulation, inheritance and polymorphism leads to code reusability. 'Reusable code' means that new programs can easily be copied and pasted together from old programs. All one has to do is access a library of objects and stitch

them into a working whole. This eliminates the need to write code from scratch and then debug it. Code reusability makes both program development and program maintenance faster.

Task 8. Match the terms with the definitions:

1) object	a) an OOP property that allows data and program instructions to be bundled into an object
2) encapsulation	b) a list of choices
3) menu	c) an OOP property that enables different objects to deal with the same instruction in different ways
4) square	d) a reusable collection of objects
5) polymorphism	e) a module containing data and program instructions
6) library	f) a rectangle with equal sides

Task 9. Complete the following text using the words from text D.

Encapsulation, (1) _____ and polymorphism are key features of (2) _____ programming. Encapsulation allows data and program instructions to be bundled together into (3) _____ called objects. Inheritance means that specific (4) _____ of a class of objects (5) _____ the properties of the class of objects. Polymorphism means that instructions are treated differently by different (6) _____. The combination of these (7) _____ features of OOP means that program code is reusable. This speeds up (8) _____ and (9) _____ of programs.

Task 10. Listen to a recording on the development of Java and find out in what connection the following phrases and years are mentioned. Audio file 3.2 [https://online-edu.mirea.ru/course/view.php?id=7376]

1990 / Sun Microsystems / handheld device / Oak / Duke / 1993 / renamed / May 1995 / animation and interactive programs / multiple platforms

Task 11. Complete the text by modifying the words given on the right or using the verbs in the correct form.

Java is an object-oriented programming language developed by Sun Microsystems. It (1) _____ to serve as a new way to manage software complexity in a cross-platform environment.	INTEND
Java is used in a (2) _____ of computing platforms. The language has become so popular that it is (3) _____ everywhere: in mobile phones, Web servers and enterprise	VARY NEAR
(4) _____. Java applets are often used to provide improved (5) _____ while browsing the World Wide Web. Another great advantage of Java is that, (6) _____ the program	APPLY FUNCTIONAL ONE
(7) _____ in Java, we can run it anywhere. This means that applications developed through Java are platform (8) _____.	WRITE DEPEND

Task 12. Match the terms with their definitions:

assembly language / debugging / object-oriented language / compatible / binary code / inheritance / assembler / source code / interpreter / compiler / encapsulation

1. A special program that converts a program written in a low-level language into machine code.
2. A code made of just two numbers (0 and 1).
3. A low-level language that uses abbreviations, such as ADD, SUB, and MUL, to represent instructions.
4. A special program that converts a source program (written in a high-level language) into object code in one go.
5. The ability of one class to use properties and behavior of another class.
6. A high-level language allowing to alter a particular function of a program without changing the entire program.
7. A special program that translates the source code line by line, as the program is running.
8. The ability to bind data and methods into one unit.
9. Program instructions written in a particular computer language.
10. The techniques of detecting and correcting errors which may occur in programs.
11. Capable of running on most computer platforms.

Task 13. Render the following article into English.

Язык Java был создан в компании Sun Microsystems в 1992 г. Первоначально язык предназначался для платформо-независимого программирования процессоров, встроенных в различные бытовые устройства.

Основным недостатком существовавших на тот момент языков программирования была их ориентированность на конкретный процессор. Даже языки высокого уровня, позволявшие, в принципе, создавать программы для любого процессора, требовали наличия соответствующего компилятора, выходной код которого ориентирован на процессор, на котором программы будут исполняться. 'Вековая мечта' всего программирующего человечества - чтобы программу можно было один раз написать, а дальше использовать на разных процессорах и под разными операционными системами - на тот момент не была реализована. Именно эту мечту и хотели воплотить в жизнь разработчики языка Java.

Интересно, что, сами того не подозревая, они создали нечто гораздо большее, чем задумывали. Дело в том, что совершенно независимо от создания языка Java шло развитие Интернета. И тут выяснилось, что идеи, заложенные в этот язык, позволяют решить многие проблемы, связанные с программированием для Интернета. В любом случае вместо узкоспециализированного языка программирования для встроенных процессоров получился универсальный язык, который позволял создавать программы, не зависящие от процессора и операционной системы, да ещё и с поддержкой современных технологий! Именно такой универсальный язык программирования Java и был представлен компанией Sun Microsystems для коммерческого использования.

Task 14. Translate the following article into English.

Python - это высокоуровневый объектно-ориентированный язык, созданный голландским разработчиком Гвидо ван Россумом (Guido van Rossum) в 1991 году и ставший одним из самых популярных языков в наши дни. Python используется многими крупными компаниями, такими как Google, Facebook, IBM и NASA.

Python - интерпретируемый язык, что значит, что код в Python не компилируется, а перевод в машинный код выполняется программой-интерпретатором. Благодаря этому код в Python запустится на любой платформе, на которой установлен интерпретатор. Из минусов - код обрабатывается не заранее, а в процессе, а это снижает скорость и требует большего ресурса памяти для запуска написанных на нём программ по сравнению с аналогичным кодом, написанным на компилируемых языках, таких как C или C++.

Python используется в анализе данных, веб-разработке, а также в других сферах, включая разработку игр. За счёт читаемости, простого синтаксиса и отсутствия необходимости в компиляции язык хорошо подходит для обучения программированию, позволяя концентрироваться на изучении алгоритмов, концептов и парадигм.

UNIT 4. WEB DESIGN

Task 1. Lead-in questions.

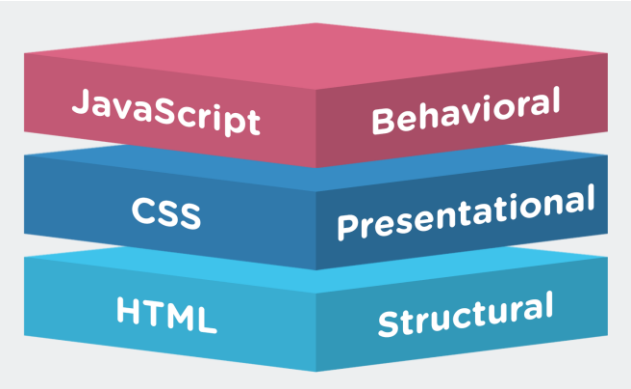
1. What languages and tools are used to create web documents?
2. What are the main stages in building a website?
3. What are the benefits and downsides of website builders?

Task 2. Translate the terms into Russian and give a definition in English:

a) backend development
b) CSS
c) frontend development
d) HTML
e) hyperlink
f) JavaScript
g) markup tags
h) to rank high
i) SEO
j) a template
k) URL
l) website builder

Task 3. Read and translate text A. Answer the questions.

Text A. Webpage design



If you are learning web development, you will come across terms like HTML, CSS, and JavaScript. These three tools dominate web development.

Hypertext Markup Language, or **HTML**, is a code used to describe the structure of information on a webpage. HTML consists of commands called tags which are placed around different kinds of contents (e.g. tables, paragraphs, lists, hyperlinks, images, videos, etc.) telling the web browser how to display them.

CSS also known as **Cascading Style Sheets** is a design mechanism whose primary function is to improve the appearance of a webpage by defining its styling and layout. CSS provides a way to define and apply styles consistently across all pages of a website, making it easier for developers to maintain and update their designs.

JavaScript, which is often abbreviated to **JS**, is another core technology of the World Wide Web. JS is a cross-platform, object-oriented programming language used by developers to make web pages interactive, intuitive and user-friendly. It allows developers to create dynamically updating content, use animations, pop-up menus, clickable buttons, etc. Whereas HTML & CSS are used to control presentation, formatting, and layout, JavaScript is used to control the behavior of different web elements. Without JavaScript, 90% of Internet webpages would be static.

1. What three tools used in web development are mentioned in the text?
2. What does HTML stand for?
3. What is the role of tags in HTML?
4. What is short for Cascading Style Sheets?
5. What is CSS responsible for?
6. What features can be added to a webpage with the help of JavaScript?

Task 4. Read an article about Web design software and decide which of the following phrases is suitable for each gap:

a) to customize the template
b) to drag and drop images onto your web pages
c) to have a website
d) to include a wide variety of templates with a professional look
e) to include excellent site builder software

Text B. You Can Build Your Own Website

Almost anyone willing (1) _____ nowadays can build one on his or her own. Not only high-tech people possess the ability to build amazing websites. Building a website on your own is not only possible, it is fun, affordable and surprisingly easy.

In the past, to build a website people had to learn HTML (hyper-text markup language). Today all you need is site builder software. An increasing number of hosting companies have expanded their services (2) _____.

Having a variety of predesigned templates makes building a website much easier. People who need a website simply find a template in a design that suits their tastes. The next step is to use the site builder (3) _____ by changing colors and images. Then they can add on any additional features they desire such as video

plug-ins. Changing what they do not like about a template is much quicker and easier to do than starting a website design from scratch.

Good site builder software incorporates WYSIWYG (What You See Is What You Get) editors, so users can edit text in any way they see fit. This software allows users to create website pages similar to editing a document, moreover, they have the ability (4) _____.

When looking for a site builder it is advisable to check if it includes options to easily add on additional functionality to the website. Some users want the site builder (5) _____. Others might want add-on features such as forums, image galleries, and shopping carts, as well.

Now you see that building a website is not as complicated as you may have previously thought. Anyone can give it a try, as all it takes is to use a site builder and you will have a website designed in no time.

Task 5. Watch a video on free website builders at [https://www.youtube.com/channel/UCm2bHu2-sIhdIMRGrHtuUPg], name their downsides and listen out for the synonyms of the following words.

a) _____
b) _____
c) _____

1) cheap
2) restrictions
3) to improve
4) commercial
5) depository
6) boundless
7) characteristic
8) to examine

Task 6. Read some tips on creating an effective website and find the English equivalents for the Russian words. Report on the useful tips mentioned in each part to the rest of the group.

Text C. Achieving an effective website design for your brand

Whether your goal is to increase brand awareness or to sell a product or service, effective website design can be the difference between a new conversion and a lost prospect. The last thing you want is for a poorly designed website to dissuade site

visitors from becoming customers. Follow these tips for effective website design and you should start seeing more conversions in no time.

(1) Keep it simple

When it comes to effective website design, the simpler the better! The paradox of choice dictates that the more options you give people, the easier it is for them to choose nothing at all. In the case of web design, this has never been more true. Having too many options on your website can overwhelm visitors and drastically increase the amount of time it takes for them to make a decision. Fancy layouts can be visually appealing, but you never want your graphics to distract users from finding what they came to your website for in the first place. Simple, sleek designs have proven long-lasting and sure to withstand the test of time. Moreover, they allow users to more easily navigate your site and quickly find the information that really matters to them.

Strategic use of white space can really bring out the wow factor of your website! White space, also known as negative space, is the areas on your website that are intentionally left empty. No, it does not necessarily have to be white. White space includes the blank area between images and text blocks, the space in the margins of each page, and even the gaps between letters and words. When the majority of the page is void of text and images, leaving a simple, clean design, it does not overwhelm website visitors. It also helps people focus on important features of the site, since there are no distracting elements and the eye is naturally drawn to the most important features of the page.

резко увеличиться	выдержать проверку временем
отвлекать	большая часть страницы

(2) Conventions are cool

People are used to certain generic website layouts. Being unique is usually a good thing, but it might be a better idea to take advantage of what users are already comfortable and familiar with. There’s no need to reinvent the wheel when it comes to effective website design. A few examples of effective website design conventions to stick to are: navigation menus at the top of each page, contact information at the bottom of each page, a clickable logo at the top of the page that will redirect back to the homepage, a search bar at the top of the page, usually on the right-hand side.

Any links should appear in a different color or should change colors when users hover over them. Also, for e-commerce sites, shopping cart icons are a recognizable feature to accompany “add to cart” or “view cart” buttons. People are trained to look

for certain buzzwords like “check out,” “add to cart,” “contact us,” and “submit”. It may be enticing to think outside the box and use different wording, but that can actually deter some people from converting since they were in search of a more typical word. Avoiding fancy jargon and sticking to what people are used to makes your website easier for visitors to navigate.

схема расположения (макет)	повторно изобретать колесо
воспользоваться преимуществом	внизу страницы

(3) Aesthetics is everything

No matter how great the content on your site is, you could be losing conversions if your website isn’t visually appealing. Three of the most important aesthetic elements for effective website design are colors, typography, and balance. As many of us know, colors elicit emotional responses. For example, warm tones like pinks and yellows make people more excited and energized while cool tones like blues, greens, and purples are more tranquil and calming.

When choosing a color palette for your website, you’ll want the perfect balance of harmony and contrast. Heavily contrasting colors (like hot pink and lime green) can be jarring and distracting. It’s best to focus on hues in the same color family. Bold colors are best used for call-to-action buttons to make them stand out, so avoid using these colors in the background of your site. Just be wary of using too many different colors. Using too many different colors is one of the quickest ways to overwhelm users. It is recommended to use a maximum of five different colors for effective website design. Three or four is preferred though.

визуально привлекательный	избегать
выделяться	фон

(4) Keep load time in mind

The days of dial-up are dead for a reason! Several years ago, experts used to say users would abandon a website if it took longer than eight seconds to load. That statistic has now been cut by more than half. If your website takes longer than three seconds to load, you could be losing valuable customers.

So how do you speed up a slow site? One way to improve load time is to optimize image sizes on your site. Large files take longer to load, so reducing the size and scale of some images can shorten a webpage’s load time. Another possible tactic is to upgrade your servers. Keep in mind that it shouldn’t take more than a few seconds for

your website to load, no matter what type of device it is being accessed from. Test your site to ensure it loads quickly, not just on a desktop, but on smartphones and tablets, too.

покинуть вебсайт	сократить время загрузки
ценный клиент	убедиться

(5) A picture is worth a thousand words

It may seem cliché, but it's true! Pictures convey a lot more information much quicker than large blocks of text. In truly effective website design, images can also be strategically placed to subtly guide users to where you want them to go. They can act as arrows pointing towards conversion points like "Shop Now" and "Contact Us" buttons.

All images should be high resolution and should fit the overall style of your website. It's also a good idea to incorporate images of people as our eyes are naturally inclined to recognize faces. If you're using stock photos, be careful not to choose ones that look too staged. This can come off as cheesy. When possible, replace text on your website with infographics.

They are a great resource to effectively convey information while still grabbing users' attention. The average user skims a website rather than reading it in full detail. This is why infographics may be able to convey information more effectively than standard paragraphs.

передавать информацию	узнавать
высокое разрешение	обычный пользователь

(6) Optimization

As with most things in today's digital age, the key to success in web design is constant optimization. You should consistently be testing your website to make sure it is as user-friendly as possible and effectively designed to maximize conversions. Sometimes, it can be difficult to catch mistakes on your own website. We recommend having other people look it over including friends and professionals who can offer suggestions on how to improve your website's user experience. Many third-party sites also offer heat maps you can install to see which parts of your website visitors interact with the most. This will give you a good idea if people are focusing too much on unimportant details of the site and getting distracted from main conversion points. When testing your website for optimization purposes, remember to view it from

multiple different devices, browsers, and operating systems. You want to make sure your site runs properly no matter how visitors are accessing it. Also, keep in mind that optimization is not a one-and-done activity. You must consistently be updating your website with new information to keep it up-to-date.

цифровой век	взаимодействовать
устанавливать	обновлять сайт

Task 7. Read text D and modify the words in brackets to fill in the gaps.

Text D. What is SEO?

SEO stands for Search Engine Optimization. Optimizing websites for *Google* and other search engines is essential for any website (1) _____ *(own)* if they want to reach a larger audience. Studies suggest that when using search engines, most people do not go beyond the listings mentioned on the first couple of pages of the search engine results list. SEO refers to a set of (2) _____ *(improve)* that help your website to rank higher in Search Engine Results Page. In short, it is all about (3) _____ *(get)* users to visit your site without directly (4) _____ *(pay)* for advertising. SEO is (5) _____ *(incredible)* important as websites on the first page of search results receive the (6) _____ *(major)* of clicks. The number of people clicking a website (7) _____ *(decrease)* the further down the page they rank.

SEO is a fundamental part of (8) _____ *(digit)* marketing because people conduct millions of searches every day, often with intent to find information about products and services. Greater (9) _____ *(visible)* and ranking higher in search results than your (10) _____ *(compete)* can have a material impact on your revenues.

Task 8. Watch a video at [https://youtu.be/D7UxlkwdYc0] and answer the following questions. Make your own predictions first.

1. What is the main purpose of SEO for a site owner?
2. What benefit does SEO bring to Google?
3. What is the Google indexing system compared to in the video?
4. What does the term 'organic results' mean?
5. How many people usually click on the second page of results?
6. What do users usually do if they don’t get the relevant results on the first page?

7. How many clicks will first three listing results get?
8. What are the two types of SEO?
9. In what way are these approaches different?

Task 9. Fill in the gaps with the appropriate prepositions.

1. The last thing you want is for a poorly designed website to discourage site visitors _____ becoming customers.
2. CSS is capable _____ applying different fonts and styles to a text on a web page.
3. When possible, replace text on your website _____ infographics.
4. You shouldn't use more _____ three different fonts across your entire website.
5. Design is not just what it looks _____. Design is how it works.
6. You can create a mobile version _____ your website, or you can simply utilize a responsive website layout that adjusts _____ different screen sizes automatically.
7. Chatbots on your site save you the expense of employing staff to work _____ customer service representatives.
8. Website builders are DIY online tools that allow you to create and design your own website _____ knowing a single line of code!

Task 10. Listen to an expert giving a talk on blogs and complete the summary and the flow chart below. Write ONE WORD ONLY for each answer. Audio file 4.1 [https://online-edu.mirea.ru/course/view.php?id=7376]

Blogs and the History of Blogging

A blog can perhaps be best described as a website that consists of a kind of journal that is regularly (1) _____. Blogs cover a very wide variety of topics and many of them are personal diaries. Blogs are usually not monologues because they have interactive elements, which may lead to friendships or even (2) _____ relationships between people.

The first 'blog' was probably created in 1994 by a student called Justin Hall and he called it his (3) '_____'. Similar websites were then created and these included (4) _____ to other websites and forums.

Blogging Workflow - Advice

Decide what the (5) _____ of your posts will be.

⇩

Do some reading before starting a post.

⇩

As you compose the post, keep a record of (6) _____ and links.

⇩

After creating the post, add some tags to it to improve (7) _____.

⇩

Use social networking sites to (8) _____ a post you think is outstanding.

⇩

Look at the (9) _____ relating to the post.

⇩

Don't simply say ‘thanks’ to people who have responded to your post.

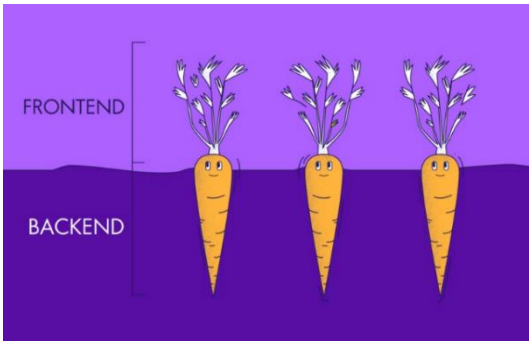
⇩

Go on to other blogs and leave comments and (10) _____ on their posts.

Task 11. Render the text into English.

Frontend *vs.* backend: различия и особенности разработки

Frontend- и backend-разработка тесно связаны между собой и не могут существовать по отдельности. Однако это совершенно разные направления программирования как по типу выполняемых задач, так и по общему предназначению.



Под понятием frontend подразумевается разработка видимого для пользователя интерфейса и всех функций, с которыми он может взаимодействовать. По сути, когда вы переходите на любой сайт, то видите там кнопки, текст, различную анимацию и другие составляющие – всё это реализовано при помощи фронтенда. Для создания этих элементов используются три разных инструмента – HTML, CSS и JavaScript.

Основной инструмент в этой сфере – язык гипертекстовой разметки HTML. Он нужен в основном для разметки документа, то есть страницы в браузере. С помощью него разработчик создает структуру, добавляет заголовки, списки и осуществляет другое форматирование контента.

Если разработчик учит HTML, он обязательно осваивает и CSS (Cascading Style Sheets). Этот язык отвечает за внешний вид страницы. С его помощью вы работаете с цветами, шрифтами и расположением различных блоков. Если простыми словами, то CSS используется для красивого оформления страницы и настройки её внешнего вида уже после того, как основная структура была написана при помощи HTML.

С помощью JavaScript реализуется выполнение различных действий на странице, то есть добавляется анимация и отклик на запросы пользователя. Например, страница реагирует на перемещение курсора и клики мышкой, изменяя поведение элементов в соответствии с действиями пользователя.

Backend-разработчик занимается разработкой серверной части веб-приложений и сайтов, где обрабатываются запросы пользователей. Попросту говоря, это все внутренние процессы, которые скрыты от глаз пользователя и происходят вне его браузера и компьютера.

Backend-разработчик работает с разными базами данных (SQLite, MySQL, MongoDB), разными серверами (Nginx, IIS и Apache), также зачастую нет ограничений в выборе языка программирования. Это может быть Java, PHP, Python, Ruby и другие.

Task 12. Match the terms with their definitions.

HTML / CSS / hyperlink / SEO / tags / customize / template / home page

1. A mechanism for adding style (e.g. fonts, colors, spacing) to web documents.
2. The first page on a website that usually contains links to other pages.
3. The language used to create hypertext documents (e.g. web pages).
4. A text, image or button that takes you to other web pages when you click on it.
5. A set of improvements that help your website to rank higher in Search Engine Results Page.
6. A pattern used as a guide to design a web page.
7. Instructions used in markup languages.
8. To modify a template of a web page to your needs.

UNIT 5. MALWARE AND CYBERCRIME

Task 1. Lead-in questions.

1. What types of malware do you know?
2. What types of cybercrime can you name?
3. What is the difference between a DoS attack and a DDoS attack?

Task 2. Translate the terms into Russian and give a definition in English:

a) adware
b) backdoor
c) copyright violation
d) cybercrime
e) DDoS attack
f) defacing
g) hijacking
h) keylogger
i) malware
j) miner
k) phishing
l) piggybacking
m) ransomware
n) salami shaving
o) software piracy
p) spyware
q) Trojan
r) worm

Task 3. Read text A and answer the questions below.

Text A. Security and privacy on the Internet

There are many benefits from an open system like the Internet, but one of the risks is that we are often exposed to **hackers**, who break into computer systems just for fun, to steal information, or to spread viruses. So how do we go about making our online transactions secure?

Security is crucial when you send confidential information online. Consider, for example, the process of buying a book on the Web. You have to type your credit card number into an order form which passes from computer to computer on its way to the online bookstore. If one of the intermediary computers is infiltrated by hackers, your data can be copied.

To avoid risks, you should set all security alerts to high on your web browser. Mozilla Firefox displays a lock when the website is secure and allows you to disable or delete **cookies** - small files placed on your hard drive by web servers so that they can recognize your PC when you return to their site.

If you use online banking services, make sure they use **digital certificates** - files that are like digital identification cards and that identify users and web servers. Also be sure to use a browser that is compliant with SSL (Secure Sockets Layer), a protocol which provides secure transactions.

Similarly, as your email travels across the Net, it is copied temporarily onto many computers in between. This means that it can be read by people who illegally enter computer systems. The only way to protect a message is to put it in a sort of virtual envelope - that is, to encode it with some form of **encryption**.

Private networks can be attacked by intruders who attempt to obtain information such as Social Security numbers, bank accounts or research and business reports. To protect crucial data, companies hire security consultants who analyze the risks and provide solutions. The most common methods of protection are **passwords** for access control, **firewalls**, and **encryption** and **decryption** systems. Encryption changes data into a secret code so that only someone with a key can read it. Decryption converts encrypted data back into its original form.

Malware (malicious software) are programs designed to infiltrate or damage your computer, for example **viruses**, **worms**, **Trojans** and **spyware**. A virus can enter a PC via an infected USB flash drive or via the Internet. A worm is a self-copying program that spreads through email attachments; it replicates itself and sends a copy to everyone in an address book. A Trojan horse is disguised as a useful program; it may affect data security. Spyware collects information from your PC without your consent. Most spyware and **adware** (software that allows pop-ups - that is, advertisements that suddenly appear on your screen) is included with 'free' downloads.

If you want to protect your PC, don't open email attachments from strangers and take care when downloading files from the Web. Remember to update your **anti-virus software** as often as possible, since new viruses are being created all the time.

1. What is a hacker?
2. How can your confidential information be stolen during online transactions?
3. What are cookies?
4. What is the role of a digital certificate?
5. What is the most common method of access control?
6. What is encryption?
7. What types of malware were mentioned in the text?
8. What is the damaging effect of spyware?
9. What is a worm?
10. What is understood by adware?

11. What are the most common ways to protect your PC?

Task 4. Read text B, guess where the following words are used, then listen and check your answers. Audio file 5.1 [https://online-edu.mirea.ru/course/view.php?id=7376]

Text B. Viruses

erase / host / attach / embedded / damage / threat /
replicate / infect / dormant / spread

The fear that a virus may (1) _____ your computer is a familiar one for many. Even casual computer users know that unfamiliar files may (2) _____ viruses.

While viruses are a well-known (3) _____, many computer users do not know their enemy. There are many specific types of viruses that one needs to guard against.

One dangerous type of virus is an overwriting virus. These viruses not only (4) _____ malicious code, they also replace the information contained in other programs. They (5) _____ important information, sometimes rendering a computer entirely unusable.

Another common virus is a resident virus. They stay (6) _____ until a particular event activates them. If your computer harbors resident viruses, you may not discover them until the (7) _____ is done.

A Trojan horse is another destructive type of program. It's not technically a virus because it doesn't (8) _____, but it's still dangerous. A Trojan horse looks like an ordinary, useful file or program. However, it has destructive programming (9) _____ in it. This programming may also piggyback onto beneficial files. Lastly, unlike viruses and Trojan horses, a worm does not need to (10) _____ itself to another program.

What's the main purpose of the article?

a) to stress the importance of having anti-virus software;
b) to explain how to avoid viruses;
c) to describe the types of viruses and other harmful programs;
d) to alert readers to the existence of a new virus type.

Task 5. Match the words or phrases (1-6) with the definitions (a-f):

1) virus
2) host
3) to embed
4) resident virus
5) to piggyback
6) overwriting virus

a) to plant a harmful program within an ordinary program
b) a virus that erases information by replacing it
c) a virus that is dormant until activated
d) a computer or program that carries a virus
e) to attach to another program for transferring
f) a harmful program that infects a computer

Task 6. Watch a video on different types of malware at [https://www.youtube.com/watch?v=n8mbzU0X2nQ], answer the questions below and complete the blanks.

A. What are some common ways for malware to enter your computer?
B. What activates viruses existing on your system?
C. What is the harmful effect of ransomware?
D. How does spyware operate?
E. What type of malware misleads the user by pretending to be a useful one?
F. What is the difference between viruses and worms?

1. Malware can make entry onto your computer via _____ _____ _____, visiting _____ websites …
2. Viruses often _____ on the Internet and _____ when downloading a file infected with a virus.
3. A Trojan is a _____ piece of software that looks _____.
4. Ransomware holds your PC _____ and _____ money. It locks up your computer _____ to destroy data …
5. _____ secretly _____ private information about the user activity …
6. Worms can _____ _____ and infect multiple computers on the network _____ _____ _____.

*Task 7. **Read text C and find the equivalents to the words below.***

Text C. Virus vs Worm

The main difference between a virus and a worm is that viruses must be triggered by the activation of their host, whereas worms are standalone malicious programs that can self-replicate and propagate independently as soon as they have breached the system. Worms do not require activation - or any human intervention - to execute or spread their code.

Viruses are often attached or concealed in downloaded files. When the host file is accepted by a system, the virus remains dormant until the infected host file is activated. Only after the host file is activated, the virus can run, executing malicious code and replicating itself to infect other files on the computer.

In contrast, worms don't require the activation of a host file. Once a worm has entered the system, usually via a network connection, it can run, self-replicate and propagate without a triggering event. A worm makes multiple copies of itself, which then spread across the network. These copies will infect any inadequately protected computers and servers that connect - via the network or internet - to the originally infected device.

1) distinction	3) hidden	5) demand	7) inappropriately
2) while	4) stay	6) as soon as	8) appliance

Task 8. Listen to a conversation between two IT employees. Mark the following statements as true, false, or not given and complete the blanks. Audio file 5.2 [https://online-edu.mirea.ru/course/view.php?id=7376]

1. A virus has spread to several computers.
2. The woman suggests shutting down all the computers.
3. The man has already checked the resident extensions.

Employee 1: Gary reported that his desktop isn't working. It won't even (1) _____ _____.

Employee 2: Have you looked at it?

Employee 1: Yeah. I (2) _____ _____ _____ earlier today. I'm afraid it's probably a virus.

Employee 2: I hope it's not an (3) _____ _____, or we'll have trouble (4) _____ his files.

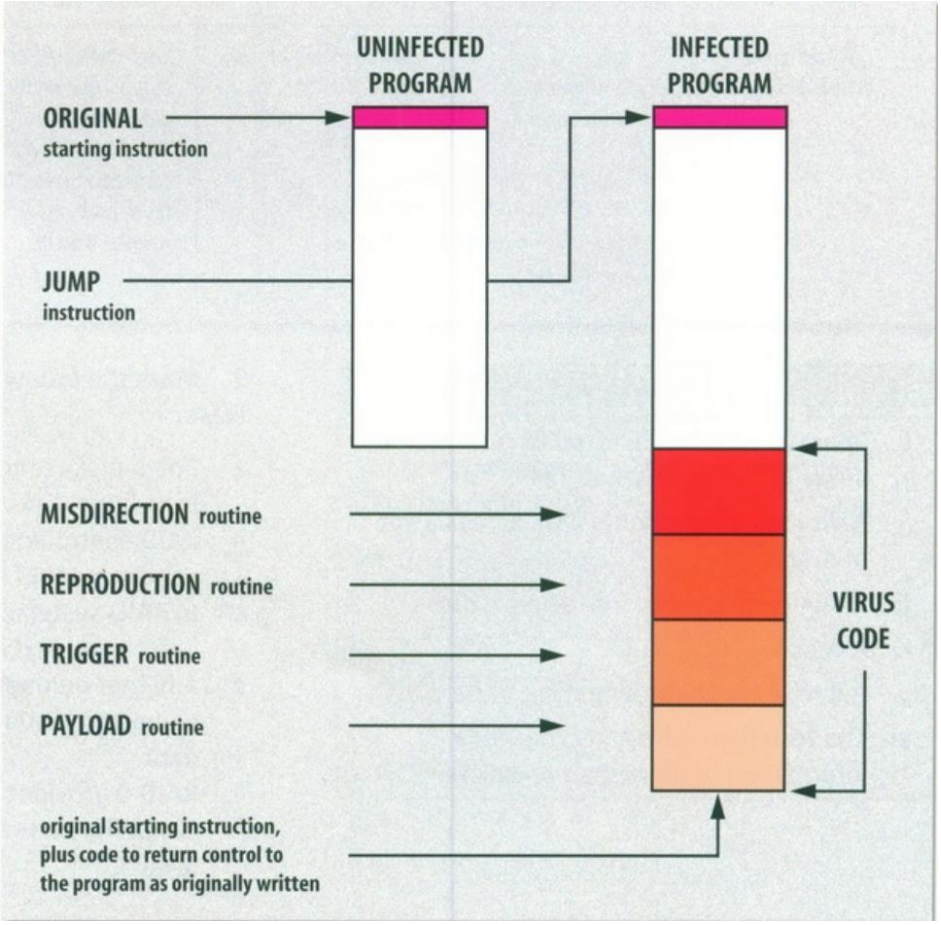
Employee 1: He said he recently (5) _____ a new word processing program. Maybe, it was a Trojan horse.

Employee 2: Well, at least it would be (6) _____ _____ his computer.

Employee 1: Yes, but it could be a (7) _____.

Employee 2: If it's a worm, we'll have to make sure it hasn't (8) _____ _____ the other computers on the network.

Task 9. Study this diagram which explains how viruses operate. Try to answer the following questions:



1. What is the function of the jump instruction?
2. What are the main parts of the virus code?
3. What is the last act of the virus?

Task 10. Read text D and answer the questions below.

Text D. The anatomy of a virus

A biological virus is a very small, simple organism that infects living cells, known as the host, by attaching itself to them and using them to reproduce itself. This often causes harm to the host cells.

Similarly, a computer virus is a very small program routine that infects a computer system and uses its resources to reproduce itself. It often does this by patching the operating system to enable it to detect program files, such as COM or EXE files. It then copies itself into those files. This sometimes causes harm to the host computer system.

When the user runs an infected program, it is loaded into memory carrying the virus. The virus uses a common programming technique to stay resident in memory. It can then use a reproduction routine to infect other programs. This process continues until the computer is switched off.

The virus may also contain a payload that remains dormant until a trigger event activates it, such as the user pressing a particular key. The payload can have a variety of forms. It might do something relatively harmless such as displaying a message on the monitor screen or it might do something more destructive such as deleting files on the hard disk.

When it infects a file, the virus replaces the first instruction in the host program with a command that changes the normal execution sequence. This type of command is known as a JUMP command and causes the virus instructions to be executed before the host program. The virus then returns control to the host program which then continues with its normal sequence of instructions and is executed in the normal way.

To be a virus, a program only needs to have a reproduction routine that enables it to infect other programs. Viruses can, however, have four main parts. A misdirection routine that enables it to hide itself; a reproduction routine that allows it to copy itself to other programs; a trigger that causes the payload to be activated at a particular time or when a particular event takes place; and a payload that may be a fairly harmless joke or may be very destructive. A program that has a payload but does not have a reproduction routine is known as a Trojan.

1. How are computer viruses like biological viruses?
2. What is the effect of a virus patching the operating system?
3. Why are some viruses designed to be loaded into memory?
4. What examples of payload does the writer provide?

5. What kind of programs do viruses often attach to?
6. How does a Trojan differ from a virus?
7. Match each virus routine to its function:

	routine		**function**
1)	misdirection	*a)*	does the damage
2)	reproduction	*b)*	attaches a copy of itself to another program
3)	trigger	*c)*	hides the presence of the code
4)	payload	*d)*	decides when and how to activate the payload

Task 11. Watch a video on a DDoS attack at [https://www.youtube.com/watch?v=ilhGh9CEIwM] and answer the questions:

1. What does DDoS stand for?
2. How does a DDoS attack disrupt the work of a network or server?
3. What's the difference between a DoS attack and a DDoS attack?
4. Why is it easier to handle a DoS attack than a DDoS attack?
5. How is a DDoS attack technically performed?
6. What is a botnet?
7. What are the reasons for a DDoS attack?

Task 12. Complete the blanks with the correct prepositions.

1. A virus can stay dormant _____ a particular event activates it.
2. A Trojan horse looks _____ an ordinary, useful file or program.
3. A worm does not need to attach itself _____ another program.
4. Spyware works _____ the background aiming to collect confidential information of the user.
5. A hacker is someone who tries to break _____ a computer system.
6. We aren't permitted to download files from the Internet _____ authorization.
7. Since phishing is a serious crime, we are working ____ federal police to stop it.
8. A virus can destroy someone's files and a lost database can result ____ receiving unwanted sales calls.
9. In case _____ data breach, we inform every affected customer about this within 72 hours.
10. These viruses not only spread malicious code, they also replace the information contained _____ other programs.

Task 13. Guess what type of malware or cybercrime is described in each paragraph:

backdoor / a worm / software piracy / salami shaving / adware / a keylogger / a miner / hijacking / a DDoS attack / defacing / ransomware / phishing / spyware / a Trojan horse / piggybacking

1. _____ is malicious software designed to enter a computer device, gather data about a person or organization and forward it to a third party without a user's consent.
2. _____ is a form of financially supported malware that usually presents itself as unwanted commercials.
3. _____ is a type of spyware used to monitor and record each keystroke on a specific keyboard. The information is gathered and sent to the attacker. This malware is most often used for stealing passwords.
4. _____ is a standalone malicious computer program that replicates itself to infect other computers. It is able to spread across the network directly without attaching itself to an existing program.
5. _____ is a type of cybercrime which involves redirecting anyone trying to visit a certain site elsewhere.
6. _____ is an attack where hackers overload networks and servers with traffic so that computer systems are unable to keep up with legitimate needs.
7. _____ is any malware that misleads users of its true intent by pretending to be a useful program.
8. _____ is a type of cybercrime where the attacker sends a fake message designed to trick a person into revealing sensitive information to the attacker.
9. _____ is using technology to open the Internet connection to unwanted users.
10. _____ is a type of malware that threatens to publish the victim's data, encrypts the victim's data or blocks access to the device unless a payment is made.
11. _____ is a virus which uses your computer power to earn cryptocurrency for others.
12. _____ is unauthorized copying of a program for sale or distributing to other users.
13. _____ is a technique that involves leaving, within a completed program, an illicit program that allows unauthorized and unknown entry.
14. _____ is a cybercrime which involves changing the information shown on another person's website.

15._____ is a computer crime in which a program is altered so that it transfers a small amount of money from a large number of accounts to make a large profit.

Task 14. Translate from Russian into English.

1. Это программа, автоматически запускающая на экране рекламу.
2. Это бесплатная программа, содержащая в себе вирус.
3. Есть ряд мер, которые блокируют установку вирусов, червей, шпионских программ и другого вредоносного программного обеспечения.
4. Пользователи могут не подозревать о наличии вирусов в своих компьютерах.
5. Пиратство – это нарушение авторских прав.
6. Фишинг – это незаконная попытка получения паролей и данных кредитных карт.
7. Проникнув в систему, вирус замещает один из элементов, участвующих в загрузке компьютера.
8. Червь может распространяться по сети без человеческого вмешательства.

UNIT 6. DATA SECURITY

Task 1. Lead-in questions.

1. What are some ways to protect a computer from crimes and disasters?
2. What are some common ways to make a reliable password?
3. What is biometric authentication?

Task 2. Translate the terms into Russian and give a definition in English:

a) to back up
b) brute force
c) CAPTCHA
d) cryptanalysis
e) cybersecurity
f) to deny access
g) encryption
h) firewall
i) MFA
j) to update antivirus software

Task 3. Listen to the text of an email and choose the correct answers. Audio file 6.1 [https://online-edu.mirea.ru/course/view.php?id=7376]

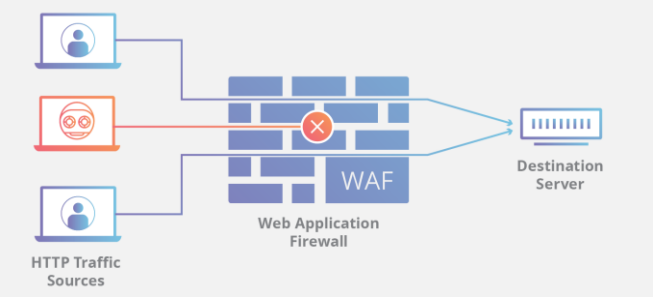
1. What is the main purpose of the email?
   a) to report a nationwide rise in Internet crime;
   b) to help clients keep their information secure;
   c) to announce a new website.

2. How can users be sure they are on the official Safeguard site?
   a) by entering a PIN;
   b) by sending an email to the site;
   c) by verifying the URL.

3. How did hackers infect customers' computers with malware?
   a) by using a keylogger;
   b) by attaching spyware to a download;
   c) by using backdoor hacks into customers' computers.

Task 4. Read text A and choose the correct answers to the questions below.

Text A. The Firewall



There are several ways that firewalls work. Most use a combination of methods. One common method is packet filtering. Incoming data is broken down into small chunks, or packets. The firewall then inspects each packet using a set of filters. Based on settings determined by the user, the firewall decides whether to deny or permit access.

Filters can be based on a number of different things. For example, filters can block all access to and from specific domain names. If a network administrator notices a particular IP address is generating a lot of traffic to or from the network, he or she could create a filter to block that IP address. Filters can also look for certain words or phrases.

For most users, the default settings of the program will provide enough protection. A user can always create an exception to allow an unauthorized program. This gives the program permission to communicate through the firewall, even if the program is normally blocked. The program accesses the Internet without lowering the settings for the whole firewall.

1. What is the main purpose of the article?

a) to explain how to install firewalls;
b) to identify common firewall weaknesses;
c) to clarify information about firewalls;
d) to compare and contrast different firewalls.

2. Which of the following is NOT one of the steps of packet filtering?

a) The firewall filters the incoming packets.
b) The network administrator decides to reject or permit the communication.
c) Data is broken into packets.
d) The firewall determines whether to accept the information.

3. Why would a user create an exception?

a) to allow communication from a particular program;
b) to lower the security settings of the whole firewall;
c) to block a certain IP address from communicating with the network;
d) to restore the firewalls default settings.

Task 5. Match the words with their definitions:

1. a firewall	a) not allowed
2. to deny	b) a division of data
3. a packet	c) to allow someone to do something
4. unauthorized	d) not to allow someone to do something
5. default	e) a program used to protect private networks
6. to permit	f) a preselected option when no alternative is specified

Task 6. Listen to a conversation between two employees. Mark the following statements as true or false. Audio file 6.2 [https://online-edu.mirea.ru/course/view.php?id=7376]

1. The woman cannot use the Internet or her email.
2. The firewall isn't installed yet.
3. The man suggests using the default settings.

Listen again and complete the conversation:

Employee 1: I'm not sure. I can't access the Internet for some reason, or check my email. I just don't know what's (1) _____ _____.

Employee 2: That's strange. Well, let me take a look and see if I can (2) _____ _____ _____.

Employee 1: Oh, that would be great. Thank you.

Employee 2: You are welcome. Well, it looks like your (3) _____ _____ is working fine, so it's not that.

Employee 1: I didn't think so. I think it might have something to do with the (4) _____ _____ they installed last night.

Employee 2: Oh, right. I forgot about that. Let's check out the (5) _____ _____.

Employee 1: What did you find out?
Employee 2: You were right. They're way (6) _____ _____!

Roleplay the conversation with another student.

Task 7. Watch a video on the firewall at [https://youtu.be/kDEX1HXybrU] and answer the questions below.

1. What is the role of a firewall?
2. Why is a network firewall associated with a firewall of a building?
3. Who in a company is authorized to set filters to allow incoming traffic?
4. What can the firewall filters be based on?
5. What is the difference between a host-based firewall and a network-based firewall?
6. What is the benefit of using a combination of a host-based firewall and a network-based firewall?

Task 8. Read text B and fill in the gaps with the missing words.

Text B. Antivirus Software

suspicious / hands-off / infected / detection / unwanted /
intent / prevent / target / robust / signature

Antivirus software is designed to detect, (1) _____ and take action to disarm or remove malicious software from your computer such as viruses, worms and Trojan horses. It may also prevent or remove (2) _____ spyware and adware in addition to other types of malicious programs. The first versions of antivirus software can be traced as far back as the 1980s.

While you may think that your computer is safe as long as you don't visit (3) _____ websites, hackers have much more nuanced ways of getting their viruses on your computers, which is why you need a (4) _____ antivirus to stay one step ahead of them. Some antivirus software will ask for your permission before "cleaning" a file to remove malicious code. If you prefer a (5) _____ approach, you can adjust the settings so the software automatically removes malicious files.

Every virus contains a (6) _____, which is like its fingerprint. It's the distinguishing feature that sets it apart from other programs running on your computer, and it also makes the virus recognizable, and therefore a potential (7) _____ for

antivirus software. Documents, programs and applications are generally scanned for viruses when they are being used. Once an executable file is downloaded, it is instantly scanned to check if it is (8) _____ with malware.

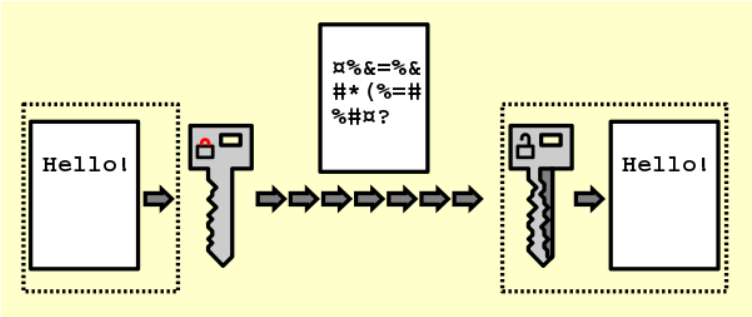
As opposed to signature-based scanning, which matches signatures found in files with that of a database of known malware, heuristic scanning uses rules and algorithms to look for commands which may indicate malicious (9) _____. This causes the antivirus programming to recognize new malware without having the exact match in the database. Most antivirus programs use both signature and heuristic-based methods in combination, in order to catch any malware that may try to evade (10) _____.

Task 9. Find English equivalents for the following words and phrases in the text:

1) принимать меры
2) нежелательные шпионские программы
3) подозрительные сайты
4) на шаг впереди
5) подход
6) отпечаток пальцев
7) отличительная черта
8) заражённый

Task 10. Read text C on data encryption, entitle the paragraphs and answer the questions below:

a) Data encryption solutions
b) Challenges to contemporary encryption
c) A definition of data encryption
d) The primary functions of data encryption



Text C. What is encryption?

1. Being one of the most popular and effective data security methods used by organizations, encryption is a way of encoding data so that only authorized parties can understand the information. In technical terms, it is the process of converting human-readable plaintext into incomprehensible text, also known as ciphertext. The term ‘cipher’ comes from the Arabic word ‘digit’ – the Arabs were the first to protect the text by replacing the letters with numbers. So ‘cryptography’ literally translates as

‘secret writing’. The reverse process of converting ciphertext into plaintext is called decryption.

2. Encryption and decryption are performed according to a cryptographic algorithm which requires a replaceable element - a cryptographic key: a randomized string of bits used to encrypt and/or decrypt data. There are two main kinds of encryption: symmetric encryption and asymmetric, also known as public key encryption. With a symmetric key system, all parties have the same key. The keys can be used to encrypt and decrypt messages and must be kept secret or the security is compromised. In an asymmetric key system, two keys are used. One key is kept secret, and therefore is referred to as the "private key." The other key is made widely available to anyone that needs it and is referred to as the "public key." The private and public keys are mathematically related so that information encrypted with the public key can only be decrypted by the corresponding private key.

3. Encoding algorithms of encryption provide confidentiality due to authentication, integrity, and non-repudiation. Authentication allows for the verification of a message’s origin, and integrity provides proof that a message’s contents have not changed since it was sent. Additionally, non-repudiation ensures that a message sender cannot deny sending the message.

4. The most basic method of attack on encryption today is brute force, or trying random keys until the right one is found. Of course, the length of the key determines the possible number of keys and affects the plausibility of this type of attack. It is important to keep in mind that encryption strength is directly proportional to key size, but as the key size increases so do the number of resources required to perform the computation. The alternative method of breaking a cipher is cryptanalysis which means finding a weakness in the cipher and exploiting it. Cryptanalysis is more likely to occur when there is a flaw in the cipher itself.

1. What is data encryption?
2. What is ciphertext?
3. What does ‘cryptography’ mean?
4. What is a cryptographic key?
5. What are the two main types of encryption?
6. What is the difference between symmetric encryption and asymmetric encryption?
7. What does encryption guarantee?
8. What is brute force?
9. What is cryptanalysis?

Task 11. Translate the sentences from Russian into English.

1. Даже самые лучшие и самые сильные компании могут столкнуться с проблемами кибербезопасности.
2. Надежное ПО является одним из самых эффективных способов защиты от киберугроз.
3. Сегодня, благодаря защищенным серверам, клиенты могут легко делать покупки онлайн.
4. Фишинговые электронные письма могут содержать ссылки на веб-сайты, которые заражены вредоносным ПО.
5. Убедитесь, что ваши действительно важные учетные записи защищены надёжными паролями, которые вы больше нигде не используете.
6. Пароли, состоящие только из цифр, хуже паролей, которые содержат разнообразные буквы, цифры и специальные знаки.
7. Защищённые веб-сайты сообщат вам, что передача данных зашифрована, и ваш браузер отобразит символ, подтверждающий это.

Task 12. Fill in the gaps with the appropriate prepositions.

1. This year, the number of data breaches is bigger _____ it was last year.
2. Strong passwords are usually case sensitive and contain a variety _____ numbers and special symbols.
3. Cloud backups are now a reliable solution to cope _____ data loss, accidental deletion, or cyberattacks.
4. Updates usually contain changes capable _____ making your device more secure.
5. The problems of security and privacy relating _____ online trading represent a significant barrier to e-commerce.
6. Encryption is the method by which information is converted ____ a secret code that hides the information's true meaning.
7. A firewall protects the system ____ public access.
8. Firewall filters can be based ___ IP addresses, domain names, port numbers, etc.
9. ____ entering your confidential data, you should make sure that you are on the official website ____ checking the URL.
10. Your device might get infected ____ malware through illegal downloads of popular movies or games.

11. The main benefit ____ multi-factor authentication is the enhancement of your online security.

Task 13. Complete the sentences with your own ideas.

1. Cyber criminals can steal confidential information if _____.
2. If you make purchases at an unsecured website, _____.
3. Any person with a computer will become a software pirate if _____.
4. If I had known about this type of cyber fraud, _____.
5. Your computer would not have been hacked if _____.
6. If you don't have a good antivirus program, _____.

Task 14. Find seventeen terms related to cybercrime.

e	d	u	w	e	r	w	o	r	m	w	a	t	n	s	p	y	w	a	r	e	c
n	y	h	p	a	o	f	u	p	i	q	u	d	q	l	o	p	l	t	g	s	p
c	w	a	o	v	i	c	t	i	m	y	t	t	r	n	f	s	u	c	w	r	c
r	a	c	w	q	u	m	s	d	k	e	h	l	a	u	e	w	n	g	u	e	y
y	n	k	g	a	d	w	a	r	e	l	e	o	n	i	t	i	a	d	m	o	b
p	n	e	g	e	q	e	f	i	n	g	n	c	s	s	r	t	u	k	a	l	e
t	p	r	o	c	m	i	n	e	r	g	t	m	o	g	o	d	t	u	l	o	r
w	s	l	u	m	l	k	a	p	u	d	i	a	m	o	j	n	h	g	i	e	t
s	f	p	h	i	s	h	i	n	g	t	c	g	w	c	a	r	o	r	c	g	h
e	u	r	i	a	g	e	k	i	m	i	a	t	a	d	n	i	r	d	i	k	r
c	o	i	n	f	e	c	t	e	d	m	t	g	r	u	a	k	i	u	o	s	e
u	t	a	g	s	p	u	l	d	f	g	i	u	e	l	l	f	z	t	u	o	a
r	l	c	k	i	a	n	g	w	r	l	o	e	w	n	d	t	e	i	s	w	t
e	q	f	i	r	e	w	a	l	l	u	n	o	d	i	f	m	d	p	n	m	g

Task 15. Read the email and answer the questions below.

To: All Employees
From: IT Director
Subject: Online transactions security

We are developing new website security features. We will have a virtual private network with a firewall which will help stop cyberattacks on the network perimeter.

The web application protection firewall (WAF) will protect our website from hacker attacks on customer contacts and login boxes. Secure Socket Layer (SSL) will create a secure connection for the users. We will have two-factor authentication (2FA). Website administrators will go through two layers of security before they access the hosting environment. This will prevent password leaks. All data will have encrypted backup to protect sensitive information.

I am sure the company will benefit from the new security measures.

Thank you
Hamda Banna

1. How many security features will the company have?
2. Which security feature will stop attacks on the company network?
3. What solution will protect customer contacts and login boxes?
4. What will protect private user information sent over the network?
5. What will the two-factor authentication prevent?
6. What will protect information?

Task 16. Match the terms with their definitions:

encryption / password / multi-factor authentication / cryptanalysis / signature / firewall / CAPTCHA / brute force / cybersecurity / heuristic scanning

1. A combination of software and hardware used to protect private networks by filtering incoming data traffic.
2. A distinguishing feature that every computer virus contains.
3. A type of malware detection technique which allows identifying potentially malicious software without having an exact match in signature database.
4. The practice employed to protect and secure computers, servers, networks, mobile devices, electronic systems, and data from being attacked.
5. A user verification technology that requires more than one type of user validation.
6. A way of encoding data so that only authorized parties can understand the information.
7. Trying random keys aiming to decrypt encoded data.
8. Secret data, typically a string of characters, usually used to confirm a user's identity.
9. The method of spotting a weakness in the cipher aiming to decrypt encoded data.
10. Completely Automated Public Turing test to tell Computers and Humans Apart.

UNIT 7. THE FUTURE OF IT

Task 1. Lead-in questions.

1. What are the latest trends in the field of IT?
2. What are the most common areas for AI technology application?
3. What are the advantages and disadvantages of using AI?

Task 2. Translate the terms into Russian and give a definition in English:

a) Artificial Intelligence
b) artificial neural network
c) augmented reality
d) backpropagation
e) biometrics
f) Internet of Things
g) machine learning
h) smart home
i) virtual reality
j) web-enabled devices

Task 3. Watch a video at [https://www.youtube.com/watch?v=3wLqsRLvV-c] on the Turing Test and answer the questions.

1. When was the idea of the Turing Test first introduced?
2. What is the procedure that the Turing Test involves?
3. What were Turing's predictions for how computers would do on the test in the future?
4. What was the name of the first program claimed to have passed the Turing test?
5. What potential problems with the test did the success of ELIZA and PARRY reveal?
6. How did Eugene Goostman manage to deceive the judges?

Task 4. Fill in the gaps with the words below and translate the text into Russian.

coined /focus /suggested /ahead /retain /emerged /dependent /human /contestants

Alan Turing, the man who was much (1) _____ of his time, started toiling on the thought whether machines can think. In 1950, a time when the computers had just come into being, and the term Artificial Intelligence was not even (2) _____ and we had Alan already thinking if a machine could think like a human. Alan Turing published a paper in 1950 in which he (3) _____ an idea or a test called 'The

Imitation Game', today known as the Turing Test. The idea behind this test was to check if machines have intelligence or not.

After modifications, Turing proposed the Imitation Game where there would be two (4) _____, one human (of either gender) and one computer. Besides, there would be a judge or an interrogator whose job would be to decide which of the two contestants is a (5) _____ and which one of them is a machine. He would do this by asking a series of questions to the contestants. Hence, in this game if the accuracy of the judge was less than 50% then it meant that he is likely to pick either of them. This would suggest that a computer is a quite good simulation of a human and therefore intelligent.

Since the time the concept of Artificial Intelligence (6) _____, creating intelligence that matches human intelligence has been the goal of thousands of researchers, engineers, and entrepreneurs. The benefits of human-like artificial intelligence (HLAI) include soaring productivity, increased leisure, and perhaps most profoundly, a better understanding of our own minds.

However, not all types of AI are human-like — in fact, many of the most powerful systems are very different from humans — and an excessive (7) _____ on developing and deploying HLAI can lead us into a trap. As machines become better substitutes for human labor, workers lose economic and political bargaining power and become increasingly (8) _____ on those who control the technology. In contrast, when AI is focused on augmenting humans rather than mimicking them, then humans (9) _____ control. What's more, augmentation creates new capabilities and new products and services, ultimately generating far more value than merely human-like AI.

Task 5. Read the text and answer the questions below.

1. In what way is an artificial neural network similar to biological brain?
2. What tasks can be accomplished by neural networks?
3. How are units arranged in a fully-connected neural network?
4. What is backpropagation?
5. Why are neural networks compared to 'black boxes'?
6. What problems do professionals come across when working with artificial neural networks?

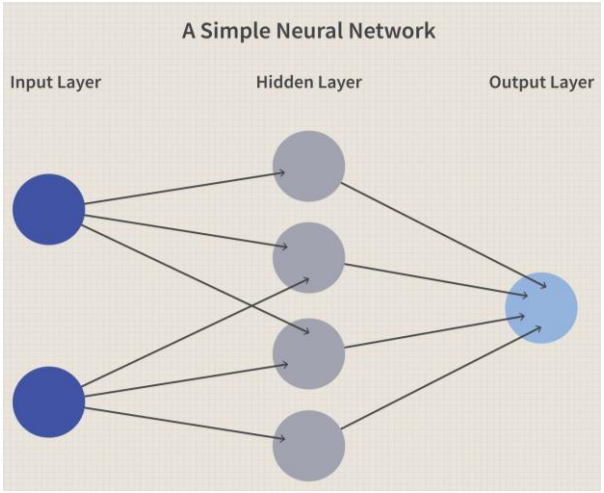
TEXT A. An artificial neural network

The basic idea behind artificial neural networks, usually simply called neural networks, is to simulate (copy in a simplified but reasonably faithful way) the work of the biological brain by creating lots of densely interconnected nodes (artificial neurons)

inside a computer so you can get it to learn things and make decisions in a humanlike way. These computer simulations are collections of algebraic variables and mathematical equations linking them together (in other words, numbers stored in boxes whose values are constantly changing).

Neural network can accomplish many tasks: from face recognition and making cars drive autonomously on the roads, to generating shockingly realistic CGI (Computer-Generated Image) faces, to machine translation, to fraud detection. Specific tasks could include classification (classifying data sets into predefined classes), clustering (classifying data into different undefined categories), and prediction (using past events to guess future ones, like the stock market or movie box office). Neural networks are excellent tools for finding patterns which are too complex or numerous for a human programmer to extract. Neural networks are not programmed in the usual meaning of the word, they are trained. Training or learning is one of the main advantages of neural networks over traditional algorithms.

A typical neural network has anything from a few dozens to hundreds, thousands, or even millions of artificial neurons called **units** arranged in a series of layers, each of which connects to the layers on either side. Some of them, known as **input units**, are designed to receive various forms of information from the outside world that the network will attempt to learn about, recognize, or otherwise process.



Other units sit on the opposite side of the network and signal how it responds to the information it's learned; those are known as **output units**. In between the input units and output units are one or more layers of **hidden units**, which, together, form the majority of the artificial brain. Most neural networks are **fully connected**, which means each unit in one layer is connected to every unit in another layer. The connections between one unit and another are represented by a number called a **weight**, which can be either positive (if one unit excites another) or negative (if one unit suppresses or inhibits another). The higher the weight, the more influence one unit has on another. This corresponds to the way actual brain cells trigger one another across tiny gaps called synapses.

For a neural network to learn, there has to be an element of feedback involved — just as children learn by being told what they're doing right or wrong. Neural networks learn things in exactly the same way, typically by a feedback process called

backpropagation. This involves comparing the output a network produces with the output it was meant to produce, and using the difference between them to modify the weights of the connections between the units in the network, working from the output units through the hidden units to the input units — going backward, in other words. In time, backpropagation causes the network to learn, reducing the difference between actual and intended output to the point where the two exactly coincide, so the network figures things out exactly as it should.

On a technical level, one of the main challenges is the amount of time it takes to train networks, which can require a considerable amount of computing power for more complex tasks. The biggest issue, however, is that neural networks are 'black boxes', in which the user feeds in data and receives answers. We can fine-tune the answers, but we don't have access to the exact decision-making process. This is the problem a number of researchers are working on today, but it will only become more important as artificial neural networks play a bigger and bigger role in our lives.

Task 6. Read the sentences below and fill in the gaps with the suitable words using the information given in the text:

artificial neurons / backpropagation / machine learning / patterns / amount of time / data

1. Artificial neural networks are one of the main tools used in _____.
2. Broadly speaking, neural networks are designed for spotting _____ in data.
3. Artificial neural network is based on _____.
4. In the same way that we learn from experience in our lives, neural networks require _____ to learn.
5. On a technical level, one of the biggest challenges is the _____ it takes to train networks.
6. Neural networks learn things in exactly the same way as people do, typically by a feedback process called _____.

Task 7. Watch a video on a new technology called IoT at [https://www.youtube.com/watch?v=6mBO2vqLv38], answer the questions (1-5) and complete the gaps (a-h) below.

A.

1. What is IoT?
2. What things can be interconnected in a smart home?

3. How can hardware be classified in the context of IoT devices?
4. Which centralized element acts as a bridge and connects IoT devices to the cloud?
5. How many devices are predicted to be connected via IoT system by 2025 according to the video?

B.

a) … what if you could use your smartphone to know __ ____ __ ____ ____?
b) Now with IoT, practically all appliances can be connected to the Internet and _____ _____.
c) IoT is a system of _____ _____ connected to the Internet to _____ __ _____ data from one to the other.
d) … but now _____ _____, or things, have the ability to sense the surroundings to interact and _____ with one another.
e) They are connected either by wired or wireless _____.
f) They _____ the temperature, _____, light intensity and other parameters.
g) Let's suppose you want to water your garden every time ___ _____ _____ in the soil drops.
h) The gateway significantly aggregates data and ____ ____ ___ ___ ____ with the help of Wi-Fi LAN.

Task 8. Read and translate text B. Answer the questions to the text.

TEXT B. Internet of Things (IoT)

The Internet of Things, or IoT, is a system of interrelated physical objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

A *thing* in the Internet of Things can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or artificial object that can be assigned with an Internet Protocol (IP) address and is able to transfer data over a network. These smart devices use embedded systems, such as processors, sensors etc., to collect, transfer and operate on data they acquire from different sources. IoT can also use artificial intelligence (AI) and machine learning to make data collecting processes easier and more dynamic.

Why IoT is important

The Internet of Things helps people to gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

IoT enables companies to automate processes and reduce labor costs. It also cuts down on waste and improves service delivery, making it less expensive to manufacture and deliver goods.

Pros and cons of IoT

Some of the advantages of IoT include the following:

- ability to access information from anywhere at any time on any device;
- transferring data packets over a connected network saving time and money;
- automating tasks helping to improve the quality of a business's services and reducing the need for human intervention.

Some disadvantages of IoT include the following:

- As the number of connected devices increases and more information is shared between devices, the risk that a hacker could steal confidential information also increases.
- Enterprises may eventually have to deal with massive numbers — maybe even millions — of IoT devices and collecting and managing the data from all those devices will be challenging.
- If there is a bug in the system, it is likely that every connected device will become corrupted.
- Since there is no international standard of compatibility for IoT, it's difficult for devices from different manufacturers to communicate with each other.

1. What does UID stand for?
2. What can be *a thing* in the Internet of Things? What examples are given in the text?
3. What benefits does the IoT bring to businesses?
4. What is the major problem of using Internet of Things in your opinion? Why?

Task 9. Find in the text above synonyms to the following words:

a) interconnected
b) to transmit
c) communication
d) built-in
e) to reduce
f) to produce
g) more affordable
h) benefits
i) downsides
j) huge
k) private
l) damaged

Task 10. Read the sentences below and fill in the gaps with the suitable words:

biochip / machine / smart / transfer

1. IoT is a system of devices that are provided with the ability to _____ data over a network without requiring human-to-human or human-to-computer interaction.
2. A *thing* in the Internet of Things can be a person with a heart monitor implant, a farm animal with a _____ transponder.
3. An IoT ecosystem consists of web-enabled _____ devices that use embedded systems, such as processors, sensors and communication hardware.
4. IoT can also use artificial intelligence (AI) and _____ learning to make data collecting processes easier and more dynamic.

Task 11. Translate the following sentences into English.

1. Искусственная нейронная сеть состоит из совокупности связанных узлов, называемых искусственными нейронами.
2. Нейронные сети не программируются в привычном понимании этого слова, они обучаются.
3. Чем больше данных обработает нейронная сеть, тем точнее будет её последующая работа.
4. Нейронная сеть — это «чёрный ящик», в который пользователь вводит данные и получает ответы. Вы можете повышать точность ответов, но вы не знаете, как именно эти ответы получены.
5. Нейронные сети — отличные инструменты для поиска закономерностей, которые слишком сложны или многочисленны, чтобы программист мог научить машину их распознавать.
6. Интернет вещей помогает людям лучше контролировать свою жизнь и повышает эффективность работы многих компаний.

7. Чем больше информации передается между устройствами, тем выше вероятность того, что хакер может украсть конфиденциальную информацию.
8. Автоматизация задач помогает повысить качество бизнес-услуг и снижает необходимость вмешательства человека.

Task 12. Match the terms with their definitions:

augmented reality / IoT / neural networks / backpropagation /
virtual reality / artificial intelligence

1. The ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans.
2. A system of interrelated computing devices, mechanical and digital machines provided with the ability to share data in order to automate processes.
3. A computer-generated space in which the user interacts with artificial objects through 3-D computer simulation.
4. Computing systems with interconnected nodes that resemble neurons in the human brain. Using algorithms, they can recognize hidden patterns and correlations in raw data, classify it, and continuously learn and improve.
5. An enhanced version of the real physical world, which integrates digital information with the existing environment in real time.
6. An algorithm that is designed to test for errors working back from output nodes to input nodes.

UNIT 8. PROFESSIONS IN IT

Task 1. Lead-in questions.

1. What highly demanded IT jobs in Russia can you name?
2. What IT jobs used to be popular but don't rank high anymore?
3. How do you see your future employment in the field of IT upon graduation?

Task 2. Translate the terms into Russian and give a definition in English:

a) backend developer
b) cloud architect
c) data scientist
d) database administrator
e) frontend developer
f) full-stack developer
g) network engineer
h) pen tester
i) software engineer
j) security specialist
k) system administrator

Task 3. Read text A below and fill in the gaps with the correct prepositions:

at / at / of / of / with / with / to / on / for / in

Text A. Computer Engineer Position Available

DynX Corp. is seeking talented computer engineers. Candidates must have (1) _____ least five years of experience. They should have mastery (2) _____ both hardware design and programming. We will only consider an applicant (3) _____ a bachelor's degree (4) ___ a relevant field. Additionally, he or she must pay close attention (5) _____ current technology and trends.

We are looking (6) _____ someone who is thorough and detail-oriented. Candidates should be able to focus (7) _____ multiple tasks simultaneously. Our systems are extremely complex. This means that even minor errors can be critical.

At DynX Corp., we value critical thinking. We appreciate employees who can find logical solutions. However, we also seek curious individuals (8) _____ innovative ideas. We encourage employees to think creatively. We want people with a balance (9) _____ both practical and creative skills. We have high standards (10) _____ DynX Corp. If you are dedicated and efficient, we encourage you to apply.

Task 4. What words from text A are defined below?

a) able to pay attention to small, specific parts of something
b) new, creative and advanced
c) able to do something competently and quickly
d) advanced knowledge or skills in a particular area
e) wholly committed to a certain task or goal
f) to give full attention to something

Task 5. Watch a video on the IT jobs ranking at [https://www.youtube.com/watch?v=BjZR3VPYL1I], answer the question below and listen out for the English equivalents of the following expressions.

1. What does the job of a **big data engineer** involve?
2. What computer tools should a **full-stack developer** be familiar with?
3. What salary is offered to experienced **cloud architects** in the USA?
4. What skills and knowledge should **product managers** possess?
5. What companies employ **product managers** according to the video?
6. What should **data scientists** be proficient in?
7. Is the ranking accurate for the Russian IT community?

a) самые высокооплачиваемые профессии
b) практический опыт
c) обладать навыком
d) зарабатывать
e) нанимать
f) обеспечивать, гарантировать
g) солидный опыт
h) приходить к важным выводам

Task 6. Fill in with the appropriate prepositions.

1. Full-stack developers should be creative, graphically inclined, and have excellent attention ____ detail.
2. A system administrator is responsible ____ maintaining an organization's computer systems.
3. Data scientists should be good ____ manipulating data to categorize it by patterns and trends.
4. An IT security specialist should have an in-depth understanding of a variety of cyber security threats that may affect the company they work ____.

5. Database administrators employ specialized software to organize and keep track ____ data.
6. IT directors ensure that department tasks correspond ____ the company's goals and development.
7. An information security analyst protects an organization’s network and systems ____ security breaches.

Task 7. Read the passages describing different jobs in IT and fill in the gaps with the suitable words and expressions.

Text B
Hardware Engineer

installation / needs / prototypes / meets / components

Hardware engineers draw on computer engineering to develop, design and test various physical (1) _____ related to computer systems. Their job also involves designing and creating (2) _____ as well as overseeing the manufacturing and (3) _____ process to ensure the hardware (4) _____ the existing standards and functions properly. Moreover, people working in this field are responsible for continuing to improve the technology to meet the changing (5) _____ of computer users.

System Administrator

ongoing / troubleshoot / responsible / respond / firewalls

A system administrator is (6) _____ for maintaining an organization’s computer systems and providing a reliable work environment. They perform (7) _____ monitoring of all servers to make sure the systems function properly, install and upgrade computer components and software, (8) _____ technical issues. A system administrator also has to ensure security through access control, backups and (9) _____. They have to monitor the system daily and (10) _____ immediately to any security and usability concerns.

Database Administrator

measures / be recovered / involves / archiving / take care

The job of a database administrator (11) _____ creating and managing computerized databases within a wide range of public and private sector organizations. They design and (12) _____ of computer database systems so that the right person can get the information they need at the right time. Responsibilities can vary according to a company's needs but typically include: (13) _____ data, implementing security (14) _____, troubleshooting, keeping the database up to date, ensuring that the database is adequately backed up and can (15) _____ in the event of data loss.

Web Developer

knowledge / user-friendly / maintain / templates / functionality

Web Developers are information technology professionals who design, develop, and (16) _____ websites. Web Developers should have in-depth (17) _____ of HTML, CSS, and JavaScript to create websites using (18) _____ or from scratch. It is also important for Web Developers to be familiar with Search Engine Optimization processes. They are responsible for maintaining a (19) _____, stable website that offers the necessary (20) _____ for their clients' needs. Using their strong technical skills, Web Developers work with Web Designers to determine the look of a website.

Task 8. Translate the following sentences into English.

1. Программист – это специалист, который создаёт код для различных программ.
2. На сегодняшний день сфера информационных технологий является одной из самых быстро развивающихся областей.
3. Системный администратор следит за тем, чтобы вся компьютерная техника и программное обеспечение в офисе работали без перебоев.
4. Тестировщик ПО моделирует различные ситуации, которые могут возникать в процессе использования программы, чтобы разработчики смогли исправить обнаруженные ошибки.

5. В обязанности администратора баз данных входит управление учётными записями пользователей и защита системы от несанкционированного доступа.
6. Наша компания ищет специалиста, имеющего опыт работы с облачными инфраструктурами.

GLOSSARY

adware	рекламное ПО
antivirus software	противовирусное ПО
Artificial Intelligence	искусственный интеллект
assembler	ассемблер
assembly languages	языки ассемблера
Augmented Reality	дополненная реальность
authentication	идентификация
bandwidth	пропускная способность
binary code	двоичный код
case sensitive password	регистрозависимый пароль
cellular connection	сотовая связь
compiler	компилятор
copper cable	медный провод
copyright violation	нарушение авторских прав
crawler-based search engine	автоматическая поисковая система
CSS	каскадная таблица стилей
cybercrime	киберпреступность
cybersecurity	кибербезопасность
data transmission	передача данных
dedicated line	выделенная линия
default settings	настройки по умолчанию
dial-up connection	коммутируемое соединение
digital signal	цифровой сигнал
download speed	скорость скачивания
DSL	цифровая абонентская линия
encapsulation	инкапсуляция
encryption	шифрование
fiber-optic technology	оптоволоконная технология
firewall	сетевой экран, сетевой фильтр
frequency	частота
high-level / low-level languages	высокоуровневые / низкоуровневые языки
high-speed Internet connection	высокоскоростное интернет соединение
HTML	язык гипертекстовой разметки
human-powered directory	веб-каталог
hybrid search engine	гибридный поисковик
hyperlink	гиперссылка

inheritance	наследование
Internet access	доступ к интернету
interpreter	интерпретатор
malware	вредоносное программное обеспечение
markup tags	теги разметки
metasearch engine	метапоисковая система
network security	безопасность в сети
neural network	нейронная сеть
patterns	закономерности
polymorphism	полиморфизм
ransomware	программы-вымогатели
remote access	удалённый доступ
request / query / search string	поисковый запрос
robotics	робототехника
satellite connection	спутниковая связь
search bar / search box	строка поиска
software piracy	компьютерное пиратство
source code	исходный код
spyware	шпионские программы
template	шаблон
to back up	создавать резервную копию
to click a suspicious link	переходить по подозрительной ссылке
to deny access	отказать в доступе
to prevent an unauthorized access	предотвратить несанкционированный доступ
to run an infected program	запускать заражённую программу
to spread viruses	распространять вирусы
to update antivirus software	обновлять антивирусное ПО
upload speed	скорость отправки
URL	электронный адрес ресурса
virtual reality	виртуальная реальность
voice recognition	распознавание голоса
World Wide Web	всемирная паутина
worm	червь

ADSL	Asymmetric Digital Subscriber Line
AI	Artificial Intelligence
AR	Augmented Reality
CSS	Cascading Style Sheets
DDoS	Distributed Denial of Service
DNS	Domain Name System
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
IoT	the Internet of Things
ISP	Internet Service Provider
MFA	Multi-Factor Authentication
OOP	Object-Oriented Programming
SEO	Search Engine Optimization
URL	Uniform Resource Locator
VR	Virtual Reality
WWW	World Wide Web

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