ENGLESKI JEZIK
ZA
POŠTANSKI SAOBRAĆAJ

VII semestar

ENGLESKI JEZIK -
POŠTANSKI SAOBRAĆAJ I TELEKOMUNIKACIJE
školska godina 2023/2024 fond časova 2+0

VII semestar – stručni kurs za studente na odseku: Poštanski saobraćaj I telekomunikacije

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konsultacije: četvrtak 11h

Skripta: Materijal za studente odseka Poštanski saobraćaj i telekomunikacije,

PREDISPITNE OBAVEZE: Test (maksimalno **40 poena**) Može se polagati samo tokom semestra na času. Proverava se znanje iz sledećih oblasti: vokabular, tvorba reci, upotreba veznika, pasiv.

ISPIT: maksimalno **60 poena**. Ispit je usmeni. Student izvlači ispitno pitanje (ceduljica sa naslovom jednog od tekstova obrađenih tokom kursa), čita tekst i odgovara na pitanja koja postavlja nastavnik.

Za studente koji su bili redovni i aktivni na času tokom semestra postoji mogućnost da umesto usmenog urade prezentaciju na temu koja je vezana za teme koje su se obrađivale tokom semestra i njihovu struku.

FORMIRANJE KONAČNE OCENE: prema skali koja je prihvaćena na Fakultetu.
(51 – 100 poena)

Transport – Some Basic Notions

Transport, or transportation (A.E.) is the movement of objects like people, goods, signals and information from one place to another.

The field of transport has several aspects: they can be divided into infrastructure, vehicles, and operations. Infrastructure includes the transport networks (roads, railways, airways, canals, pipelines, etc.) that are used, as well as the nodes or terminals (such as airports, railway stations, bus stations and seaports). The vehicles such as automobiles, trains, airplanes generally ride on the networks,. The operations deal with the control of the system, such as traffic signals and ramp meters, railroad switches, air traffic control, etc, as well as policies, such as how to finance the system (e.g. use of tolls or gasoline taxes in the case of highway transport).

Modes of transport

Modes are combinations of networks, vehicles, and operations, and include walking, the road transport system, rail transport, ship transport and modern aviation.

Transport and communications

Transport and communication are both substitutes and complements. The growth in transport would be impossible without communication, which is vital for advanced transportation systems, from railroads which want to run trains in two directions on a single track, to air traffic control which requires knowing the location of aircraft in the sky. Thus, it has been found that the increase of one generally leads to more of the other.

Transport, energy, and the environment

Transport is a major use of energy. Most transport burns hydrocarbons. If partially burned, these create pollution. Though vehicles have been getting cleaner because of environmental regulations, this has been offset by more vehicles and more use of each vehicle. Low-pollution fuels can reduce pollution. The most popular low-pollution fuel at this time is liquified natural gas. Hydrogen is an even lower-pollution fuel, but producing and storing it economically is currently not feasible. Other alternative renewable energy sources such as biodiesel are being researched heavily.

Another tack is to make vehicles more efficient, which reduces pollution and waste by reducing the energy use. If electricity can be gotten to the vehicle, electric motors are the most efficient of all. Another method is to generate energy using fuel cells, which are two to five times as efficient as the heat engines traditionally used in vehicles. A trivial, but very effective method is to streamline ground vehicles, which spend up to 75% of their energy on air-resistance. Another method is to recycle the energy normally lost to braking, but this leads to a more complex vehicle.

(from: Wikipedia, the free encyclopedia)

Practice

I Answer the questions:

1. What is transport?
2. What are the three aspects of the field of transport? What does each of them include?
3. What are the different modes of transport?
4. How are the areas of transport and communications related?
5. What can you say about transport and pollution?
6. How can pollution be reduced?

II Group these words under the appropriate heading:

roads, canals, railway stations, automobiles, pipelines, airports, airplanes, traffic signals, ramp meters, seaports, airways, railroad switches, bus stations, trains, air traffic control, railways

vehicles	networks	nodes	operations (control)

III Complete these notes using the words:

vehicles, nodes, finance, canals, airplanes, railway stations, system, tolls, railroad switches, railways

Transport

1. Infrastructure:

a) networks (e.g., roads, ...railways, airways, ..., pipelines)

b) ..... or terminals (e.g., airports, ..., bus stations, etc.)

2..... (e.g., automobiles, trains, ..., etc.)

3. Operations:

a) control of the ..... (e.g., traffic signals, ..., air traffic control)

b) how to ..... the system (e.g., ..., gasoline taxis)

IV Complete the sentences:

1 The field of transport can be divided into ....., vehicles, and operations.

2. Transport and communication are both ..... and complements.

3. The growth in transport would be ..... without communication.

4. Communication is vital for advanced transportation systems, e.g., railroads which want to run trains in two directions on a ..... track.

5. Transport is a ..... use of energy

6. If partially burned, hydrocarbons create .....

7. Low-pollution fuels such as liquefied natural gas can ..... pollution.

8. Renewable energy ..... are being researched heavily.

IV Match the two halves of the conversations. Imagine who is speaking and where they might be.

1. A return to Manchester, please.
2. I can't believe it. We've been stuck in this traffic jam for hours!
3. Tickets, please.
4. The 19.30 Los Angeles flight will be delayed by one hour due to poor weather conditions.
5. We generally got up early and went round the deck before breakfast.
6. Can you stop at the next lay-by? I think there is something wrong with my seatbelt.

a) Look, I'm really sorry, but I had it a minute ago.
b) Oh, well.... why don't we go and have a look round the Duty Free shop?
c) And did you ever have dinner with the captain?
d) Will you be coming back today?
e) Can you wait a second because I think there's a petrol station just a bit further on?
f) There are probably roadworks ahead.

Modes of transport

I Combine the words that go together

a	get on/off	1	car
b	get into / out of	2	bicycle
c	drive	3	train, bus
d	ride	4	motorbike
e	catch/miss	5	plane

II Complete the table using the words bellow:

passengers, boot, steering wheel, driver, seat belt, first class cabin, pilot, flight attendant, number plate cockpit, aisle

	car	plane	both
things			
people			

III Choose the right word or phrase

1. Do you ever *ride / drive* a bicycle?
2. A lot of people *travel by / travel with* public transport because it is cheap.
3. Let's *bring / take* a taxi, we don't want to be late!
4. When I come home from work I always get stuck in a traffic *bloc / jam.*
5. The flight was very uncomfortable, I felt relieved when the plane touched the *road / runway.*
6. The *platform / pavement* was crowded with people waiting for the train.
7. The bus mounted a pavement and injured a *walker / pedestrian*
8. The train was very crowded because there were only four *wagons / coaches*

Explanations

Passive: form

- To make the passive we use *be* and a past participle. Compare the active and passive forms in these examples:

■ Present simple	*The Government **builds** hundreds of houses every year.* *Hundreds of houses **are built** every year.*
■ Present continuous	*The authorities **are questioning** two men.* *Two men **are being questioned** by the authorities.*
■ Present perfect	*We **have chosen** Helen as the new president.* *Helen **has been chosen** as the new president.*
■ Past simple	*The police **arrested** one protester.* *One protester **was arrested**.*
■ *will*	*They **will play** the match on Wednesday evening.* *The match **will be played** on Wednesday evening.*

- Notice how the object in the active form (*hundreds of houses, two men, Helen*) moves to the front in the passive sentence and becomes the subject.

Passive: use

- Focus on important information
  Compare:
  (active) ***The Government** built hundreds of houses last year.*
  (passive) ***Hundreds of houses** were built by the Government last year.*

  In the active sentence more emphasis is given to who did the action – the Government.
  In the passive sentence more emphasis is given to the thing affected by the action – the number of houses.
  Emphasized information usually comes at the beginning of the sentence.

- Spoken and written
  The passive is used more in writing and formal speech.

Using *by* and *with*

- The person or organization that does the action is called 'the agent'. If we want to say who does the action then we use *by*.
  Hundreds of houses were built last year.
  *Hundreds of houses were built **by the Government** last year.*
  A lot of stones were thrown.
  *A lot of stones were thrown **by angry football fans**.*

- The thing that is used to perform an action is called 'the instrument'. If we want to include this we use *with*.
  *The windows were broken **with a baseball bat**.*

2 **Complete each sentence with a passive verb.**

a) The police questioned George.
George ...was questioned..... by the police.

b) Millions of people watch this programme.
This programme ..... by millions of people.

c) They will finish our new house at the end of the month.
Our new house ..... at the end of the month.

d) They've elected a new president.
A new president ..... .

e) They're rebuilding the damaged stadium.
The damaged stadium ..... .

f) They've closed the mountain road.
The mountain road ..... .

g) Students write most of this magazine.
Most of this magazine ..... by students.

h) A burglar stole my laptop.
My laptop ..... by a burglar.

i) Somebody will meet you at the bus station.
You ..... at the bus station

j) United won the cup last year.
Last year the cup ..... by United.

3 **Underline the errors in these sentences. Rewrite each sentence.**

a) Many pet dogs are losing every year.
...Many pet dogs are lost every year.....

b) The injured man was been taken to hospital.
.....

c) A new bridge is be built across the river.
.....

d) All the food at the party was ate.
.....

e) Nothing will being decided before next Saturday.
.....

f) The match is playing on Friday evening.
.....

g) The robber unlocked the door by a false key.
.....

h) This book was writing by Sam's father.
.....

4 **For every question, complete the second sentence so that it means the same as the first, using no more than three words.**

a) Archaeologists have discovered a new tomb in Egypt.
A new tomb ..has been discovered.... by archaeologists in Egypt.

b) The President will open the new sports stadium on Saturday.
The new sports stadium ..... by the President on Saturday.

c) Picasso painted this portrait.
This portrait ..... Picasso.

d) They will announce the results of the competition tomorrow.
The results of the competition ..... tomorrow.

e) They're redecorating our school during the summer holidays.
Our school ..... during the summer holidays.

f) The police in New York have arrested three terrorists.
Three terrorists ..... in New York.

g) Our company sells more than 1,000 cars every week.
More than 1,000 cars ..... our company every week.

h) They're building a new museum in the city centre.
A new museum ..... in the city centre.

5 **Rewrite each sentence with a passive verb, and so that the names of people are not mentioned.**

a) The authorities have closed the casino.
...The casino has been closed.....

b) The clubs have postponed the match.
.....

c) People all over the world speak English.
.....

d) The authorities have opened the new swimming pool.
.....

e) Someone left this purse in the classroom yesterday.
.....

f) The city council has banned traffic from the city centre.
.....

g) People have elected a new government.
.....

h) Someone broke into the flat last week.
.....

Passive: kako ce izgledati na ispitu

Prebacite date recenice iz aktiva u pasiv:

1. Someone will inform the students about the test.
2. We have corrected all the mistakes.
3. Our engineers plan all the elements very carefully.
4. They finished the new road in record time.
5. They are loading the containers on the train.

Telecommunications

Telecommunications, also known as telecom, is the exchange of information over significant distances by electronic means. It refers to all types of voice, data and video transmission. This is a broad term that includes a wide range of information transmitting technologies such as telephones (wired and wireless), microwave communications, fiber optics, satellites, radio and television broadcasting, the internet and telegraphs.

A complete, single telecommunications circuit consists of two stations, each equipped with a transmitter and a receiver. The transmitter and receiver at any station may be combined into a single device called a transceiver. The medium of signal transmission can be via electrical wire or cable (also known as "copper"), optical fiber, electromagnetic fields or light. The free space transmission and reception of data by means of electromagnetic fields is called wireless communications.

Types of telecommunications networks

The simplest form of telecommunications takes place between two stations, but it is common for multiple transmitting and receiving stations to exchange data among themselves. Such an arrangement is called a telecommunications network. The internet is the largest example of a telecommunications network. On a smaller scale, examples include:

- Corporate and academic wide-area networks (WANs)
- Telephone networks
- Cellular networks
- Police and fire communications systems
- Taxi dispatch networks
- Groups of amateur (ham) radio operators
- Broadcast networks

Data is transmitted in a telecommunications circuit by means of an electrical signal called the carrier or the carrier wave. In order for a carrier to convey information, some form of modulation is required. The mode of modulation can be broadly categorized as either analog or digital.

Telecommunications service providers

Telecommunications systems are generally run by telecommunications service providers- In many countries, telecom service providers were primarily government owned and operated, but that is no longer the case, and many have been privatized. Within the large umbrella of companies that provide different types of telecommunications services are internet service providers, wireless service providers, radio and television broadcasters, cable companies, satellite television providers and managed service providers.

http://searchtelecom.techtarget.com/definition/telecommunications

Practice

I ***Complete these sentences using the information from the text:***

1. Telecommunications is .....

2. Information transmitting technologies include: telephones, ...,, satellites, ...

3. A telecommunications circuit consists of ...., each equipped with a.....and a .....

4. Signals can be transmitted through electrical wire, ..., electromagnetic field or .....

5. The free space transmission is also called .....

6. A telecommunications network consists of multiple ..... and ..... stations which exchange data.

7. The largest example of a telecommunications network is .....

8. Other examples of smaller telecommunications networks are..... ....

9. A carrier which conveys information needs be modulated by ..... or ..... mode.

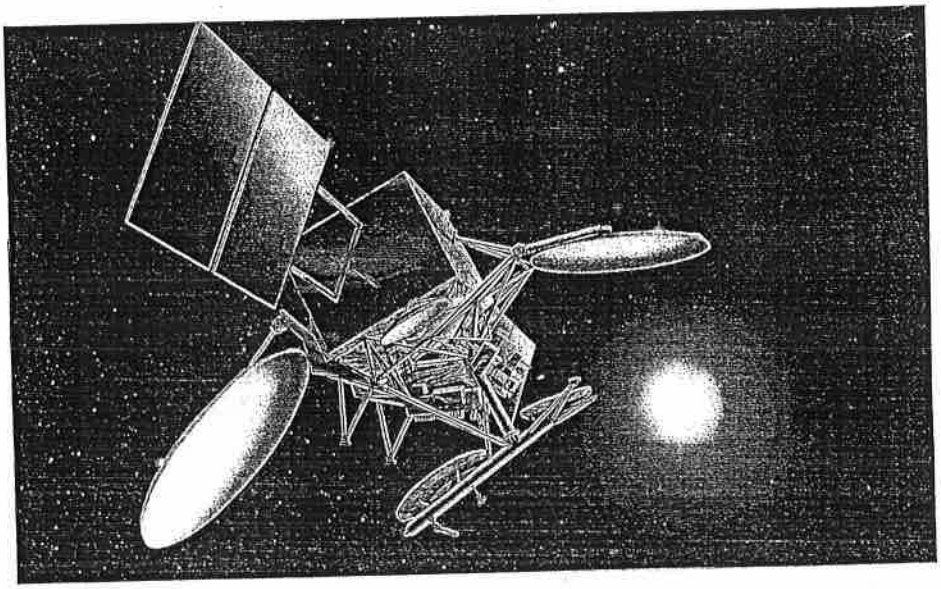
10. Telecommunications service can be provided by: internet service providers, ...

II Use *these words to complete the sentences below:*

broad, exchange, owned, means, variety, scale, single

1. Telecommunications enables us to ..... information over large distances.
2. Transmitter and receiver can be combined in a ..... device.
3. Police and fire communication systems are examples of smaller ..... networks
4. Data is transmitted by ..... of a carrier wave.
5. We can make a ..... categorization of modulation into analogue and digital.
6. Telecommunication companies now offer a ..... of internet and WAN services.
7. In the past telecom companied were government ..... and operated.

26 Telecommunications



Tuning-in

Task 1

Put these developments in telecommunications in the order in which they were invented. Compare your answer with your partner.

a telex
b communication satellites
c modems
d telegraphy
e television

Telecommunications: a brief historical review

para

The first true telecommunications system using electrical signals to carry messages started in the 1840s with machine telegraphy. Samuel Morse first developed the telegraph in 1832 but it was not until the mid-1840s that the system was put into practical use – sending coded electrical messages (Morse Code) along the wires. The telegraph became a rapid success, its speed quickly outdating the Pony Express for long-distance communications. 1

The next major step forward came in 1878 with the invention of the telephone by Bell. This enabled speech to be transported as electrical signals along wires and revolutionized personal communications. 2

In 1886, Hertz verified experimentally that electrical energy could be radiated and thus proved the existence of electromagnetic waves. This opened the way for the free-space transmission of information without wires. This provided the basis for all radio and TV broadcasting. 3

In 1901, Marconi established long-distance telegraph communication by transmitting between England and Canada. Although he did not realize it at the time, he achieved such long distances by reflecting radio waves in the ionosphere (layers of ionized gases and electrons existing in the earth's upper atmosphere at heights of 50–500 km). This overcame the problem of transmitting round the earth from one side of the Atlantic to the other. 4

para

With the discoveries of the diode and thermionic valve in the early part of this century, advances were made in both receiver and transmitter design with an associated impact in telegraphy, telephony, and civil and military communications. Radio broadcasting soon followed, with powerful transmitters serving to communicate over wide areas. Television (TV) was first established in 1937. Radar (radio detection and ranging) was also developed from the 1930s and played a vital role in aircraft detection and navigation in World War II. 5

As further advances in technology took place (e.g. the invention of the transistor in 1947 and the subsequent development of microelectronic integrated circuit technology), new applications became feasible, and new systems were developed. 6

Data communications – the transmission of coded data (e.g. text, graphics, financial information) between 'intelligent' terminals and computers – was first established in the early 1950s using modems, equipment which enables the telephone network to convey data as well as speech. Other improvements in materials and devices also led to the transmission of information via cables. Much of today's long-distance telephone traffic is by submarine cable. 7

The space race led to yet another means of long-distance communication, via fixed and mobile earth stations to satellites. Today, several hundred satellites orbit the earth, and satellite links provide all forms of communication and related services such as telephony, data, TV, navigation, meteorology, and surveillance. 8

One of the very latest developments is the optical fibre cable – a tiny glass fibre which can be used to convey signal information by light pulses. Optical fibre cable with extremely low loss at low cost has now been developed with very high data-carrying capacity. Several thousands of telephone messages can be carried down a single fibre. 9

Perhaps the greatest change which has occurred in the last twenty years is that from analogue to digital methods of information transmission. The very first commercially employed telecommunication system, telegraphy, was and still is a digital system. However, telephony, radio, and TV all started as analogue systems. Today, the general trend is strongly towards the digital, and within the next ten years the vast majority of telecommunications systems will be digital. Problems of noise and interference can be combated much more successfully in a digital system. 10

The advances in microelectronics and the merging of communications with computers have led naturally to the digital transmission mode with its advantages of computer control, automatic error checking of signals, excellent memory storage facilities for data, and intelligent terminals. The market need for vast quantities of information transmission and processing at very high speed can only be reliably catered for by using digital techniques. In fact the most rapidly growing field is almost certainly in data communications employing high-speed digital techniques. 11

TELECOMMUNICATIONS: A BRIEF HISTORICAL REVIEW – part 1

I Put the following events in correct chronological order:

a) Bell's invention, the telephone, revolutionized personal communication.
b) Marconi established long distance telegraphy by transmitting between England and Canada.
c) Radio and television broadcasting.
d) Sending coded electrical messages through the wire (telegraphy)
e) Hertz proved the existence of electromagnetic waves.
f) The development of radar.

II Complete the sentences:

verified, powerful, rapid, layers, major, vital, established, advances, achieved,

1. The telegraph soon became a ..... success.
2. The invention of the telephone was a ..... step forward.
3. Hertz ..... experimentally that electrical energy could be radiated.
4. Although he did not realize it, Marconi ..... such long distances by reflecting radio waves in the ionosphere.
5. ..... of ionized gasses and electrons in the earth's upper atmosphere is called ionosphere.
6. Discoveries of diodes and thermionic valves were important for the ..... in transmitter and receiver design.
7. Radio broadcasting used ..... transmitters.
8. TV was first ..... in 1937.
9. Radar played a ..... role during World War II.

Navedite reč sličnog značenja:	**Navedite reč suprotnog značenja:**
major	- with
verify	- forward
vital	- receiver
rapid	- powerful

III Answer these questions about Part 1

1. What was the first telecommunications system? When was it invented?
2. How would you describe it?
3. Who was the inventor?
4. What was the next major step? When was it invented? By whom?
5. What did it enable people to do?
6. What did Hertz do?
7. What did he prove?
8. Why was this important? What later inventions relied on this?
9. What did Marconi do? What two countries did he connect?
10. How did he achieve such long distance? Did he realize this?
11. What were the important discoveries in the early part of the XX century?
12. What impact did they have?
13. What important discoveries were made before World War II?

https://www.youtube.com/watch?v=dLzgRU25tXM&ab_channel=CableSupply.com

TELECOMMUNICATIONS: A BRIEF HISTORICAL REVIEW – part 2

I Put the following events in correct chronological order:

A. The invention of transistors in 1947.
B. The use of satellites (thanks to the space race)
C. Data communications using modems.
D. Merging of communications with computers.
E. The use of optical fibre.

II Complete the sentences:

feasible, loss, military, coded, tiny, error, developed, submarine, vast, meteorology, majority,

1. Thanks to the invention of transistor and integrated circuits new applications became .....
2. Data transmission enabled the transmission of ..... data such as text, graphics or financial information using modems.
3. Much of today's long-distance telecommunication traffic is by..... cables.

4. First satellites were developed for ..... purposes during the so-called 'space race'.
5. Today satellites are used for communications, TV, navigation, ... etc.
6. Optical fiber is a ..... glass fiber which can be used to carry information by light pulses.
7. The advantage of optical fibers is their low ..... and low cost with high data caring capacity.
8. The fist telecommunication system (the telegraph) was a digital system. The system that were ..... after that used analogue methods. Today the trend is towards the digital and the ..... of information systems are now digital.
9. Digital transmission mode has numerous advantages: computer control, automatic ..... checking for data, excellent memory facilities, etc.
10. Data communications enables rapid processing ..... quantities of data. .

III Can you explain the following words from the text:

advance, related, single, employ, majority, combat, merge

IV Povezite reci koje imaju suprotno znacenje

1. rapid	a) huge
2. fixed	b) small
3. tiny	c) slow
4. vast	d) mobile
5. analogue	e) disadvantage
6. advantage	f) digital

III Answer these questions about Part 2

1) When was transistor discovered?
2) What important invention followed?
3) What was the result of this new advances?

4) When was data communications first established?
5) What was used first for the transmission of data?

6) What was the result of the space race?
7) What are satellites used for today?

8) How is optical fibre described in the text?
9) What are the advantages of optical fibres?

10) What is the greatest change that happened in the last 20-30 years?
11) How did telephony radio and TV started? As analogue or digital systems?
12) What is the advantage of digital systems?

Transmission lines

Technical reading *Transmission lines*

Task 8

Write down any types of cable and transmission lines used in telecommunications that you can think of.

Now read the text to find answers to the following:

1 Why are wires sometimes twisted together in transmission lines?
2 What is the purpose of the dielectric material in coaxial cable?
3 What frequencies can be carried by the following types of transmission lines?
   a coax
   b waveguides
4 What are the advantages of optical fibre cable?

Transmission lines

Telecommunications involves the transmission of information, including voice, data, TV, and radio over long distances. The transmission medium can be free space (ground, space, and sky waves), or the information can be guided between transmitters and receivers using transmission line cables of various kinds. These include:

Parallel wires

This is the simplest type of transmission line consisting of a pair of insulated copper wires running side-by-side and covered by a plastic sheath (see Fig. 1). It is prone to interference and is only used to carry information over small distances such as telephone connections within a building.

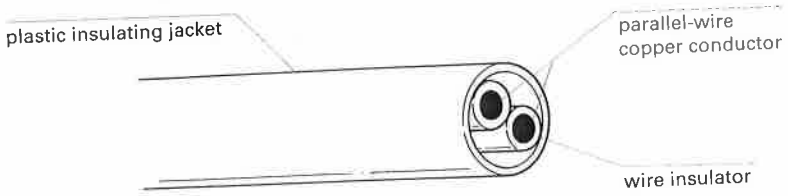


Fig. 1

Twisted pair

Two insulated copper wires are twisted together to reduce interference effects and are enclosed in an insulating polyethylene sheath (see Fig. 2). Because the wires are twisted, unwanted stray signals picked up by one tend to be cancelled by similar signals picked up by the other. They are used for communications over longer distances, for example to connect telephones to their local exchange.

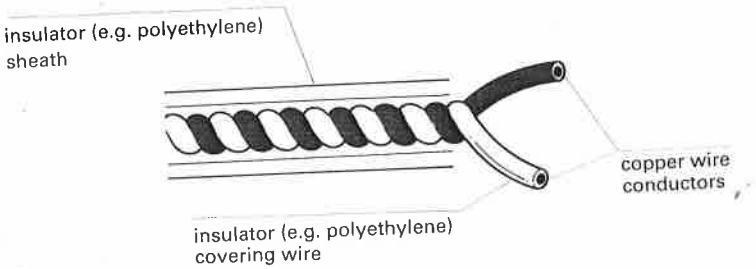


Fig. 2

Coaxial cable (coax)

Flexible coax has a copper wire core surrounded by copper braid. The core and braid are insulated from each other by a dielectric material such as polyethylene and covered by a PVC sheath (see Fig. 3).

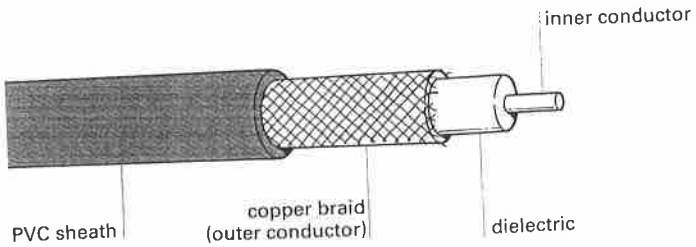
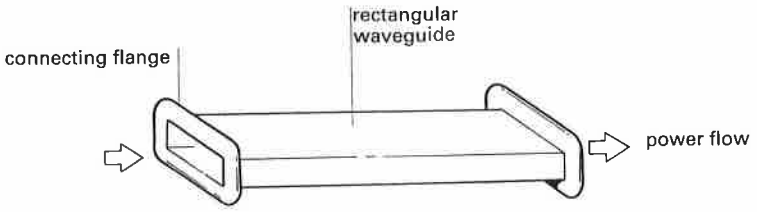


Fig. 3

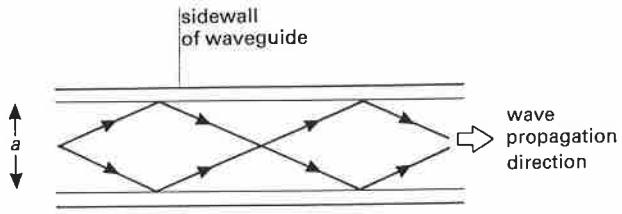
The braid helps to screen the signals from interference. Coax can carry a large number of signals over long distances at frequencies up to 1 000MHz. It is used to connect telephone exchanges and for cable television.

Waveguides

Microwaves can be guided along rectangular copper ducts by a series of reflections from the inner walls (see Fig. 4).



(a) rectangular waveguide for microwave transmission



(b) 'guiding' of electromagnetic waves in a waveguide

Fig. 4

The exact dimensions of the ducts are determined by the frequency to be transmitted. Suitable frequencies are between 1GHz and 300GHz. Waveguides are used to carry microwave signals between dish aerials and receivers.

Optical fibres

An inner core made from very pure silica fibre is surrounded by a similar glass sheath, known as cladding. This is covered by a protective plastic sheath. Non-visible light from lasers or LEDs can travel along the fibre by reflection from the surface where the core and cladding meet (see Fig. 5).

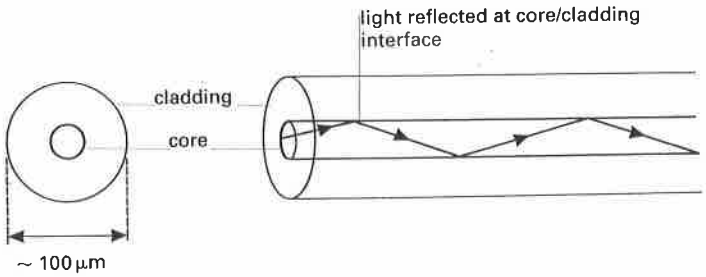


Fig. 5

Although the optical fibre has a smaller diameter than a human hair, it can be used to transmit tens of thousands of signals at high speed with very low loss and no interference from other signals. Optical fibre cable can be used in corrosive environments and is light, flexible and cheap. This type of cable is gradually replacing conventional copper wire for connecting telephones and computer networks.

Transmission lines

I Make connections:

a) parallel wires

b) twisted pair

c) coax cable

d) waveguides

e) optical fibres

1. transmission by light pulses
2. prone to interference
3. twisted wires reduce interference
4. has a braid that helps to screen signals from interference
5. rectangular in shape
6. carry microwave signals between dish aerials and receivers
7. core made of pure silica
8. smaller than a human hair
9. connect telephones to their local exchange
10. used for cable television

II Complete the text

copper, reduced, loss, sheath, exchange, rectangular, advantages, hair, interference, core, depend, environments.

The simplest form of transmission is parallel wires. They consist of two..... wires running side by side and covered by a plastic ..... Because they are prone to ..... they are only used for short distances.

If the two wires are twisted, as is the case with twisted pairs, the interference is ..... Twisted pairs can be used for connecting telephones to their local.....

Coaxial cable consists of a wire ..... surrounded by copper braid. The braid helps to screen the signals from interference. Coax is used to connect telephone exchanges and for cable television.

Waveguides are ..... copper ducts where transmission is achieved by a series of reflections from the inner walls. The exact dimensions ..... on the frequency to be transmitted.

Optical fibres are now replacing copper wires because they have a number of ..... They can be used to transmit thousands of signals with very low ..... and little interference. They are light, flexible and cheap and can be used in corrosive ..... Although they are smaller than a human ....., they can transmit tens of thousands of signals.

https://www.youtube.com/watch?v=N_kA8EpCUQo&ab_channel=CorningIncorporated

III Answer the questions:

1. What transmission lines are described in this text?
2. What is the simplest type of transmission line?
3. What does it look like?
4. What is the problem with this type of wire? Where are they used?

5. What does a twisted pair look like?
6. Why are twisted pairs better than parallel wire? How is the problem of interference reduced?
7. Where are twisted pairs used?

8. How would you describe coaxial cable or coax?
9. What is the function of the braid?
10. Where are coax cables used?

11. What is the shape of the waveguides?
12. How do microwaves travel through the waveguides?
13. What are the suitable frequencies for this type of transmission?
14. Where are waveguides used?

15. Describe optical fibres? How big/small is it?
16. How does light travel through an optical fibre?
17. What are all the advantages of optical fibres?
18. Where are optical fibres used?

Upotreba veznika

Dve kraće rečenice se mogu spojiti veznikom.

Ukoliko koristimo veznike kao što su ***when, after, before, while, until***
pokazujemo da između radnji opisanih ovim rečenicama postoji određeni **vremenski** odnos.
Npr
When they improved their IT system, they got much better results

when – dve radnje se odvijaju u istom vremenskom periodu
When you enter this area you should wear protective clothing.

after – jedna radnja se dešava posle druge
After they finished the experiment, they wrote a report .

before – jedna radnja se dešava pre druge radnje
Before he started this course, he knew very little about electric motors.

while - jedna radnja se dešava paralelo sa drugom radnjom
While they were waiting for the bus, it started to rain.

until – jedna radnja traje sve dok druga ne počne
The virus is not activated until you open the infected file.

Although i **Even though** imaju isto značenje = iako, mada
Npr:
1. It was raining.
2. They went for a walk.

Although it was raining, they went for a walk.
Even though it was raining, they went for a walk.

Despite i **in spite of** imaju isto značenje = uprkos
Ako pogledamo iste primere:
1. It was raining.
2. They went for a walk.

Sa ovim veznicima spojićemo ih:
In spite of the rain they went for a walk.
Despite the rain they went for a walk.

Sa ovim veznicima rečenica se menja jer oni „traže" iza sebe imenicu (the rain) a ne celu rečenicu . Zbog toga možemo da spojimo rečenice i na ovaj način:
In spite of the fact that it was raining, they went for a walk. (the fact je ovde imenica koja je potrebna iza **in spite of**)

Veznici koji povezuju **uzrok i posledicu** su **since** (= pošto) i **therefore** (= stoga)
Npr:
3. They were tired.
4. They went home.

Since they were tired, they went home.
(Pošto su bili umorni, otišli su kući.)
Ili:
They were tired, therefore they went home.
(Bili su umorni, stoga su otišli kući.

Veznici koji izražavaju **kontrast** su **while** i **whereas** (isto značenje = dok)
Npr:
5. He likes football.
6. His brother likes volleyball.
Možemo da spojimo:
He likes football while his brother likes volleyball.
He likes football whereas his brother likes volleyball.

Nasuprot tome rečenice:
7. He likes football.
8. His brother likes football.
Možemo da spojimo:
Both he and his brother like football.
Both = oba, i jedan i drugi

Veznik **however** = međutim (ne: bilo kako bilo!!!) se koristi da poveže rečenicu koja je na neki način kontradiktorna sa onim što je prethodno rečeno, npr:
9. They worked hard.
10. They could not solve the problem
They worked hard. However, they could not solve the problem.

Vežbe za veznike

I Dopunite rečenice odgovarajućim veznikom

***in spite of / despite* (znače isto) ili *although / even though* (znače isto)**

1. .....the rain, we still went to the park.
2. ..... it was raining, we decided to go for a walk.
3. ..... the fact that it wasn't easy, I finished the homework.
4. ..... the restaurant has a good reputation, the food was terrible.
5. .....I waited for a long time, he didn't come
6. He finished on time ..... the initial problems.
7. They solved the problem..... it was not easy.

whereas / while* (znače isto) ili *both

1. They interviewed ..... students and teachers.
2. They worked for two hours ..... we finished in only 40 minutes.
3. Our engineers investigated ..... the position and the type of the device.
4. I wake up at 7 every day ..... my brother doesn't get up before midday.

since, therefore oba veznika iskazuju uzročno-posledične odnose. Obratite pažnju na njhovo mesto u rečenici:

since + uzrok + nastavak rečenice (posledica).....

uzrok + **therefore** + posledica....

1. ..... this material is very expensive, it is not often used.
2. Our experts studied every aspect of the problem ..... there were no surprises.
3. ..... he was the strongest candidate, he got a scholarship in Japan.
4. The system is highly sensitive .....it records all the changes.
5. ..... we had no other option we accepted this offer.

when, while, until, after

1. The phone can't be used again ..... it is recharged.

2. ..... you were watching TV, I finished my homework. 3. You must study regularly ..... you study engineering.

4. You can ask questions ..... Mr Sloane finishes his presentation.

II Dopunite rečenice odgovarajućim veznikom – primer kako će izgledati zadatak na testu:

however, before, although, while, despite, until, even though, when, therefore

1. ..... the restaurant has a good reputation, the food was terrible.
2. I waited..... everyone left the room. Then I left, too.
3. I played a lot of tennis ..... I was on holiday
4. People in our group did the job early ..... the people in other groups did not finish on time.
5. They tried to solve the problem. ....., they could not find the solution.
6. You must hand in your project ..... you go on holiday.
7. They have a very systematic approach..... they don't make mistakes.
8. ..... his good results, the boss does not really like him.

MAIL

Mail, or **post**, is a method for transmitting information and tangible objects, wherein written documents, typically enclosed in envelopes, and also small packages, are delivered to destinations around the world. Anything sent through the postal system is called **mail** or **post**.[1]

Postal systems often have functions other than sending letters. In some countries, the postal system also has some authority over telephone and telegraph systems. In others, postal systems allow for savings accounts and handling applications for passports.

The worldwide postal system comprising the individual national postal systems of the world's self-governing states is co-ordinated by the Universal Postal Union, which among other things sets international postage rates, defines standards for postage stamps and operates the system of International Reply Coupons.

In most countries a system of codes has been created (they are called *ZIP Codes* in the United States, *postcodes* in the United Kingdom and Australia, and *postal codes* in most other countries), in order to facilitate the automation of operations. This also includes placing additional marks on the address portion of the letter or mailed object, called "bar coding." Bar coding of mail for delivery is usually expressed either by a series of vertical bars, usually called POSTNET coding, or a block of dots as a two-dimensional barcode. The "block of dots" method allows for the encoding of proof of payment of postage, exact routing for delivery, and other features.

Types of mail

- Letters

Letter-sized mail comprises the bulk of the contents sent through most postal services. These are usually documents printed on A4 (210×297 mm), Letter-sized (8.5×11 inches), or smaller paper and placed in envelopes.

While many things are sent through the mail, interpersonal letters are often thought of first in reference to postal systems. Handwritten correspondence, while once a major means of communications between distant people, is now used less frequently due to the advent of more immediate means of communication, such as the telephone or e-mail.

Bills and invoices are often sent through the mail, like regular billing correspondence from utility companies and other service providers.. While still very common, many people now opt to use online bill payment services, which eliminate the need to receive bills through the mail. Paperwork for the confirmation of large financial transactions is often sent through the mail. Many tax documents are as well.

New credit cards and their corresponding personal identification numbers are sent to their owners through the mail. The card and number are usually mailed separately several days or weeks apart for security reasons.

Bulk mail is mail that is prepared for bulk mailing, often by presorting, and processing at reduced rates. It is often used in direct marketing and other advertising mail

First-Class Mail in the U.S. includes postcards, letters, large envelopes (flats), and small packages, providing each piece weighs 13 ounces (370 g) or less. Delivery is given priority over second-class (newspapers and magazines), third class (bulk advertisements), and fourth-class mail (books and media packages).

Registered mail allows the location and in particular the correct delivery of a letter to be tracked. It is usually considerably more expensive than regular mail, and is typically used for valuable items. Registered mail is constantly tracked through the system.

- **Postal cards and postcards**

Postal cards and postcards are small message cards that are sent by mail unenveloped; Postcards are often printed to promote tourism, with pictures of resorts, tourist attractions or humorous messages on the front and allowing for a short message from the sender to be written on the back.

- **Other**

Larger envelopes are also sent through the mail. These are often composed of a stronger material than standard envelopes and are often used by businesses to transport documents that may not be folded or damaged, such as legal documents and contracts. Due to their size, larger envelopes are sometimes charged additional postage.

Packages are often sent through some postal services, usually requiring additional postage than an average letter or postcard. Many postal services have limitations as to what a package may or may not contain, usually placing limits or bans on perishable, hazardous or flammable materials.. As a result of terrorism concerns, the U.S. Postal Service subjects their packages to numerous security tests, often scanning or x-raying packages for materials that might be found in biological materials or mail bombs.

Newspapers and magazines are also sent through postal services. Many magazines are simply placed in the mail normally (but in the U.S., they are printed with a special bar code that acts as pre-paid postage – see POSTNET), but many are now shipped in shrink-wrap to protect the loose contents of the magazine.

Practice

I Dopunite tekst odgovarajućim rečima:

bars, envelopes, tangible, postage, accounts, dots, facilitate, packages, applications, stamps,

1. Mail is a method for transmitting ..... objects, written documents and small ..... to destinations around the world.
2. Letters are typically enclosed in .....
3. In some countries postal systems have some authority over telephone and telegraph systems, allow for savings ..... or handling .....for passports.
4. Universal Postal Union sets international ..... rates, defines standards for ..... and operates a system of international reply coupons.
5. A system of post codes (ZIP codes, postal codes) has been created to ..... the automation of postal operations.
6. Barcoding is usually expressed by a series of vertical ..... or a block of .....

II Complete the text using the following words:

frequently, correspondence, sent, bills, means,

Letters are documents printed on A4 size paper and ..... in envelopes.

Although handwritten ..... is usually thought of first in reference to postal system it is now used less ..... and is replaced by more immediate ..... of communication such as telephone or e-mail.

Today the majority of mail that arrives in our mailboxes consists of ..... and invoices.

III Answer the questions:

1. What are postal cards and postcards?
2. How do they promote tourism?
3. What do larger envelopes look like? Who uses them usually?
4. Why are they charged additional postage?

5. What can and cannot be sent through the mail in a package?
6. What kind of security test are packages subjected to?

The postal service evolution

At the turn of the 20th century, mail volume burgeoned dramatically while mail handling became an extremely labor-intensive and time-consuming process. The answer to these problems was cutting-edge mechanization for its time. First, sorting machines were proposed by inventors already in the early 1900s. However, broad development of mechanization in postal operations was not until the mid-1950s. During the 1960s and 70s, mechanization turned into the backbone of letter-sorting operations bringing increased productivity. By the mid-1970s, escalating mail volume required even more efficient methods and equipment.

The transition from mechanization to automation for the U.S. Postal Service started in 1982, when the first optical character reader was installed in Los Angeles. The introduction of computers revolutionized the postal industry, and since then, the pace of change has accelerated dramatically.

In the 80s, the first OCRs were confined to reading the ZIP Code. In the 90s, they expanded their capabilities to reading the entire address, and in 1996, the Remote Computer Reader (RCR) for the USPS could recognize about 35% of machine printed and two percent of handwritten letter mail pieces. Another 10 years brought about an unparalleled breakthrough in reading quality.

Today, modern systems can recognize 93% of machine-printed and about 88% of handwritten letter mail more than 90% cumulatively. Due to this progress in recognition technology the most important factor in the efficiency of mail sorting equipment the cost of processing the mail dropped from an estimated $55 per 1,000 letters manually to less than $5 per 1,000 letters with automated sorting. Another significant achievement of the last decade is that technology has enabled the automation of mail types that were difficult or impossible to automate 10 years ago, for example, magazines and parcels.

Thus, a decade of intensive investment in automated sorting technology, based on OCR, resulted in high recognition rates of machine-printed and handwritten addresses delivered by state-of-the-art systems. Analysis of the entire mail stream, and the understanding of the current state of the technology and its potential, may give us answers about the future of mail processing.

Practice

I What is the meaning of these words?

1. burgeon	a) spine, the most important structural part
2. time-consuming	b) begin to grow or increase rapidly; flourish.
3. cutting-edge	c) speed
4. backbone	d) taking a lot of time
5. pace	e) increase speed
6. accelerate	f) most modern stage of development
7. breakthrough	g) to cause something to continue
8. sustain	h) an important discovery

significant =

entire =

manually =

remain =

permanently =