HỌC VIỆN CÔNG NGHỆ BƯU CHÍNH VIỄN THÔNG

BÀI TẬP

TIẾNG ANH

CHUYÊN NGÀNH ĐTVT

(Dùng cho sinh viên hệ đào tạo đại học từ xa)

Lưu hành nội bộ

HÀ NỘI - 2006

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Biên soạn : THS. NGUYỄN QUỲNH GIAO
THS. NGUYỄN HỒNG NGA

UNIT 1

Exercise 1. Read the following passage then answer the questions.

ANALOGUE AND DIGITAL NETWORKS

Digital technology in the telephone network is nothing new. Take all the relays in older exchanges as an example. Relays are either "off" or "on", and there is no state in between these. Suitable combinations of relays could build up and "remember" numbers - perhaps a far-fetched example, but in was digital, so it will serve!

What is new is the transfer of speech digitally. In other words, the sound we make when we speak is converted to digits and sent out on to the network. In order for the person called to understand what we are saying, these numbers must be converted back to audible sound again.

The audibility of speech transmitted in analogue form over long distances can be very bad. Due to, for instance, noise it may be difficult to understand or recognize what the other person is saying. But with a number, things are different. It would need very bad handwriting indeed to distort a "one" beyond recognition! So even if the one is distorted when it arrives, it can still be interpreted and recreated to give undistorted sound in the receiver.

In analogue lines, the sound is amplified at regular intervals. The corresponding stage in digital lines is regeneration, i.e. the distorted number is interpreted and recreated. Herein lies an important difference between the characteristics of the two methods of transmission. In the analogue system the noise is also amplified. Every amplifying stage along the line leads to an accumulation of noise. In the digital system, the information is created anew at every regeneration stage, and can be sent on unaffected by the noise.

A. Write True (T) or False (F) for each sentence. If false, say what is true.

.....1. The telephone network has used digital technology for a long time.

.....2. It has been possible to transfer speech digitally for a long time.

.....3. Speech cannot be converted into digits.

.....4. Speech transmitted in analogue form is never very clear.

.....5. Sometimes noise on the line makes it impossible to hear what a person is saying on the telephone.

.....6. Digital transmission is never affected by noise.

.....7. Even if affected by noise, digits can still be interpreted easily.

.....8. Only the sound of speech, not noise, is amplified in analogue lines.

.....9. Digital signals are also amplified at regular intervals.

.....10. Digital transmission is superior to analogue.

B. Now complete these sentences with a word starting with RE.

Note: RE means **again** or **back.**

Example: *recreate* means to create again; *regenerate* means to generate again.

1. It is not difficult to ..... digital signals.
2. We can ..... the signals at regular intervals in digital lines.
3. The telephone receiver can ..... an electrical signal to audible sound.
4. Every year I ..... the furniture in my room.
5. I failed the test, so now my teachers will ..... me.

C. Find the opposites of these words.

distorted	important .....
affected	suitable .....
audible	possible .....

Now complete the sentences with a word starting with **un, in** or **im.**

1. The sound is ..... by noise in digital lines.
2. Optical fibre systems are ..... where there is not much traffic.
3. Transmission by optical fibre cables is ..... by bad weather.
4. Sometimes it is ..... to understand what a person is saying.
5. It's an ..... day today. I lost my money.
6. You must speak louder - your voice is .....
7. Don't worry about your clothes - it's..... what you look like.
8. I wish I could find an ..... present for my husband.

D. Look through the reading passage again and find the nouns which go with these verbs.

Example: to arrive (verb) -> the arrival (noun),

inform.....	interpret.....
distort.....	recreate.....
transmit.....	amplify.....
recognise.....	accumulate.....
regenerate.....	combine.....
communicate	

Exercise 2. Complete the sentences, using suggested words.

1. .....in the telecommunications networks of today is, more and more, digital in nature, and the transmission medium of choice is fiber.	transmit
2. "Digital", however, does no more than imply a string of 1s and Os ..... through the network.	race
3. But how are these 1s and Os to be.....?	arrange
4. At what speed ..... they to travel?	be
5. What route should they.....?	take
6. Answers to questions such as these have taken many forms and	

have made for the most ..... aspect of the telecommunications business.	complicate
7. There has never been a ..... of coding schemes in the industry.	scare
8. Starting with Morse code, going to the Baudot code, then the ASCII code, we have seen each providing for .....transmission and higher quality.	good

Exercise 3. A. Fill in the blanks with suitable noun form of the given words.

EXAMPLES OF EXTERNAL NATURAL / MANMADE FORCES

- Natural Environ-mental Forces

  * Temperature:

    Due to freezing: - Increased ground .....(1. resist)
    - Loose poles
    - Compressive collapse of cable inside duct

    Due to changing temperature:
    - Cracks, ...(2. expand)/ contraction

  * Wind (mist, etc.): - Collapse, vibration cracks, ...(3. disconnect), corrosion
  * Rain, water (ground seapage, etc.): - Flooding, corrosion
  * Snow: - Disconnection and .....(4. destroy) by accumulated snow
    - Insufficient .....(5. high) for cable due to fallen snow
    - Corrosion, insulation .....(6. fail)
  * Humidity: - Cable sheath damage, corrosion of cable conductor
  * Sand storms: - Destruction
  * Earthquake: - Disconnection, collapse due to land subsidence
  * Geology/ geography:

    + Sun light: - .....(7. discolor), ...(8. deteriorate)
    + Mice, birds, bugs...: - .....(9. damage)

- Manmade Environmental Forces:

  * Electric power line: - Induction
  * DC railway: - Electrical corrosion
  * AC railway: - .....(10. induct)
  * Distribution line: - Induction
  * Smoke from plants, etc. : - Corrosion
  * Cars (vibration, smoke): - Cracks, breaks, corrosion
  * General work: - Cuts, destruction

Exercise 4. Read the following text carefully.

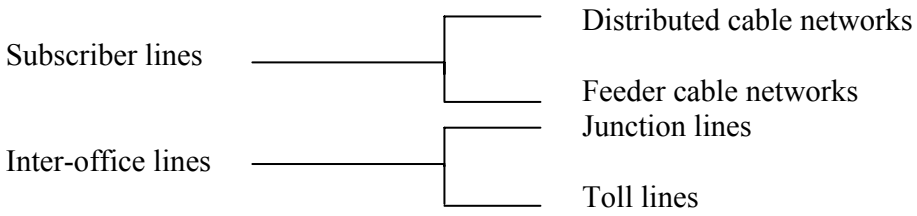
CLASSIFICATION OF OUTSIDE PLANTS

1. Classification by application.

Line networks are roughly classified by application into subscriber lines that connect telephone offices to subscribers and lines that connect telephone offices.

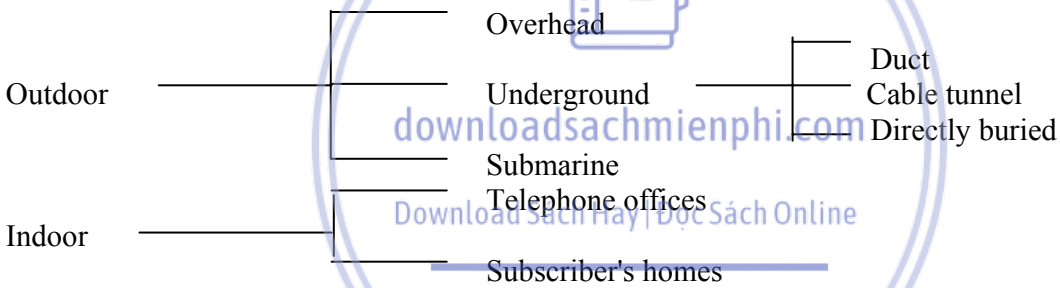
Subscriber lines are divided into distributed cable networks that efficiently store plan-distributed subscribers, and feeder cable networks that concentrate distributed cable networks and connect them to telephone offices using multiple pair cable.

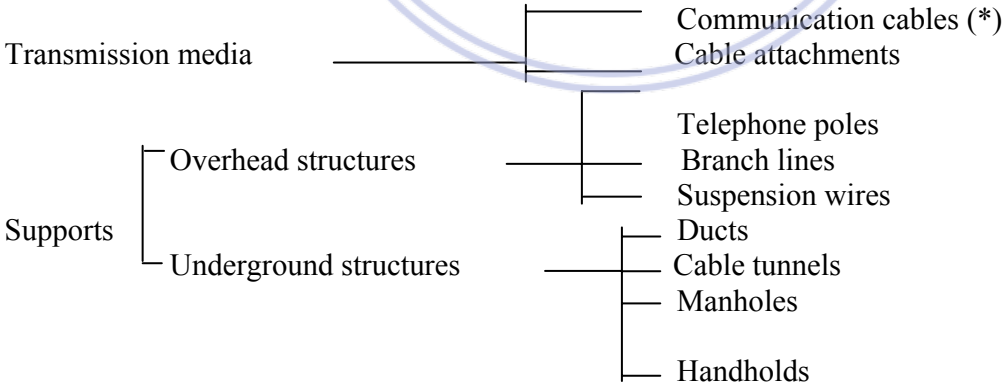
Interoffice lines are divided into fairly short junction lines that connect telephone offices within the subscribers' area, and medium- /long-distance toll lines that connect telephone offices outside the subscribers' area. These classifications are shown below.



2. Classification by set-up site.

Where line networks are set up can roughly be classified as indoor and outdoor. Outdoor set-up sites are divided into overhead, underground and submarine sites, while indoor set-up sites are either telephone offices or subscribers' homes. This is how line networks are classified according to set-up site.





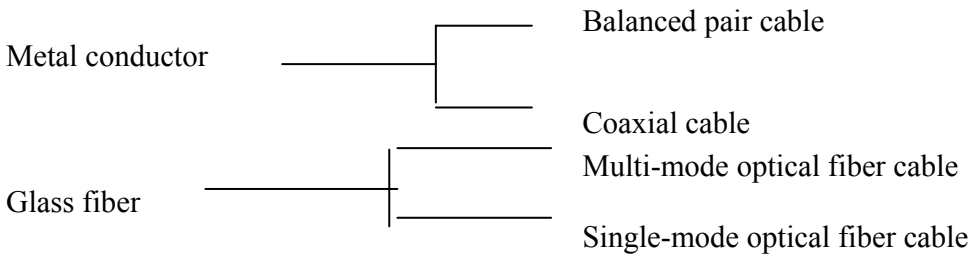
3. Classification of components.

Outside plant components are roughly classified into transmission media and the supports.

Transmission media are divided into communication cables and cable attachments, such as junction boxes, etc., while supports are divided into overhead structure and underground structures. The Figure above shows these classifications.

* Types of communication cable by its structure.

Communication cable can be classified by its structure into balanced pair cable and coaxial cable, both of which use metal conductors, and optical fiber cable, which uses glass fiber, and has recently received much attention. The classification of communication cable by its structure is shown below.



A. Complete the sentences with NOT MORE THAN FIVE WORDS for each blank, basing on the text.

1. Outside plants can be classsified according to application,..... and components.
2. Line networks are roughly classified by application into ..... and inter-office lines.
3. Subscriber lines are divided into ..... cable networks and ..... cable networks.
4. Interoffice lines are divided into ..... that connect telephone offices within the subscribers' area, and ..... that connect telephone offices outside the subscribers' area.
5. Where line networks are set up can roughly be classified as.....
6. Outdoor set-up sites are divided into overhead, underground and ..... sites.
7. Indoor set-up sites are either .....or subscribers' homes.
8. ..... are roughly classified into transmission media and the supports.
9. Transmission media are divided into ..... and cable attachments.
10. ..... are divided into overhead structure and underground structures.
11. Both balanced pair cables and coaxial cables use .....
12. ..... cables use glass fiber.

B. Match the two columns to make suitable phrases.

• telephone	• lines
• feeder	• fiber
• subscriber	• media
• set-up	• plants
• outside	• offices

• coaxial • metal • glass • transmission • cable • toll • junction • underground	• lines • conductors • boxes • cable • attachments • site • structures • cable

Exercise 5. A. Match the two columns to make suitable phrases.

1. two-pair 2. ten-pair 3. distribution 4. cross connection 5. fifty-pair 6. secondary 7. intermediate 8. primary 9. line	a. point b. amplifier c. wire d. repeater e. network

B. The letters of these words are mixed up. What are the words?

1- LBEAC : ..... 2- ETLEPOHNE : .....

3- YSCAOEDRN : ..... 4- ISDNTTORIBIU : .....

5- INETPQMUE : ..... 6- NTEERREFNCEI : .....

C. Make sentences using the verbs given:

e.g. leaves - A call leaves the subscriber's house on a two-pair wire.

1. goes . . . . . .

2 join . . . . . .

3 form . . . .

4 lay . . . .

5 maintain . . . . . .

UNIT 2

Exercise 1. Read the following text carefully.

HIERARCHICAL NETWORKS

It should be recognized that the interconnections between the various central-offices (COs) can be twisted copper-pair carrier systems utilizing copper pairs (e.g., T1), microwave, satellites, and certainly fiber.

However, this hierarchical network is not the only network in the telephone system of today. There are many others including the following:

* A local-area network (LAN) is a limited-distance network connecting a defined set of terminals. It could connect workstations in an office, office in a building, or buildings on a campus.

* A wide-area network (WAN) links metropolitan or local networks, usually over common carrier facilities.

* The intelligent network is a concept that centralizes a significant amount of Intelligence rather than installing this intelligence in individual COs. For instance, how does a particular CO know which long-distance carries is to receive a particular call?

* The synchronous optical network (SONET) is a particular set of standards that allows the inter-working of products from different vendors. It usually embodies a fiber-optic ring that will permit transmission in both directions.

* The Internet is really quite different from the network we have been describing. It is a packet network (rather than a circuit-switched network), but, as has been discussed, it is an overlay network.

* The common channel signaling network is especially important; it works closely with the PSTN (Packet Switched Telephone Network). We also apply the term out-of-band signaling. In the original PSTN, signaling (e.g., call setup) and talking utilized the same common trunk from the originating switching system to the terminating switching system. This process seized the trunks in all of the switching system involved. Hence, if the terminating end was busy, all of the trunks were set up unnecessarily. In the mid-1970s, the common channel signaling network was established: it utilizes the protocol called signaling system 7 (SS7). With this system, a talking path was not assigned until all signaling had been satisfactorily completed. This network, incidentally, was and is a packet network rather than a circuit-switched network.

A. Match the two columns

1. SONET	a. a wide-area network
2. LAN	b. Packet Switched Telephone Network
3. SS7	c. a local-area network
4. COs	d. synchronous optical network

5. PSTN	e. central-offices
6. WAN	f. signaling system 7

B. Decide what kind of network is mentioned, using suggested words.

SONET *WAN* *Internet* *LAN*
The intelligent network *SS7* *original PSTN*

1. It is a packet network and is an overlay network.
2. It usually embodies a fiber-optic ring that will permit transmission in both directions.
3. It links metropolitan or local networks, usually over common carrier facilities.
4. It is a limited-distance network connecting a defined set of terminals.
5. It is a particular set of standards that allows the inter-working of products from different vendors.
6. It could connect workstations in an office, office in a building, or buildings on a campus.
7. It is a concept that centralizes a significant amount of Intelligence rather than installing this intelligence in individual COs.
8. With this system, a talking path was not assigned until all signaling had been satisfactorily completed.
9. In it, signaling and talking utilized the same common trunk from the originating switching system to the terminating switching system.

Exercise 2. Read the following text carefully.

LIFELINE FOR VOICE OVER DSL (VODSL)

As more and more customers access to broadband services through digital subscriber line (DSL), the current practice of having multiple voice lines and separate data lines may be replaced by VoDSL service. Significant cost savings can be achieved by aggregating these multiple services into one packetized line.

Although current data services are quite reliable and improving, they are not yet quite as reliable as dedicated traditional voice services. A voice service is required to be available at all times. In the event of power failure, the telephone equipment is required to function normally in order to allow emergency responses. VoDSL also requires this lifeline feature.

For residential applications, where an asymmetric digital subscriber line (ADSL) service is installed, the issue is not so significant because the baseboard is reserved for the plain old telephone service (POTS) line. For business applications, however, a symmetrical DSL (SDSL) service having no baseband POTS is more popular. In this case, a loop management system (LMS) will prove invaluable to guarantee lifeline by offering access to a standby POTS service. This is a more elegant solution than having batteries as a power-failure backup in the customer premises equipment (CPE), as batteries are labor-intensive and require maintenance.

When the digital subscriber line access multiplexer (DSLAM) detects that the CPE side is not responsive it will report an alarm to a software monitor that will send the proper command to the LMS to switch over the equipment to a POTS service.

A. Match the beginnings and endings to make complete sentences.

1. Current data services... 2. Current data services... 3. The current practice of having multiple voice lines and separate data lines... 4. Significant cost savings... 5. A voice service... 6. Batteries... 7. For business applications, a symmetrical DSL service having no baseband POTS...	a. may be replaced by VoDSL service. b. are not yet quite as reliable as dedicated traditional voice services. c. can be achieved by aggregating these multiple services into one packetized line. d. is required to be available at all times. e. is more popular. f. are quite reliable and improving g. are labor-intensive and require maintenance.

B. Give the full form of the abbreviations.

• LMS: ..... • DSL: ..... • VoDSL: ..... • SDSL:	• ADSL: ..... • CPE : ..... • POTS: ..... • DSLAM: .....

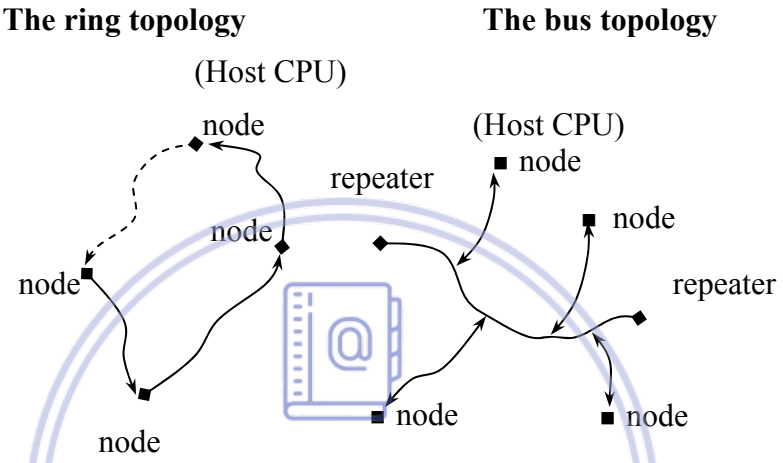
Exercise 3. Below are some of the objectives of the Biarritz project as defined by the French Telecommunications Administration. Try to classify these objectives under the headings "Technical Objectives", "Commercial Objectives" and "Industrial Objectives".

1. Acquiring the necessary competence to design high bandwidth optical fibre networks.
2. Winning a large part of the fast-developing optical fibre market.
3. Designing and producing well-adapted, reliable components.
4. Defining the applications of the videophone in order to produce commercially viable systems.
5. Creating new jobs in industry.
6. Obtaining the necessary technical know-how to enable installation of the equipment in a natural environment rather than in a laboratory.
7. Observing how use of the videophone changes people's behaviour (for example, letter writing or visiting friends) in order to produce high-quality non-expensive systems.
8. Creating new industrial companies.
9. Solving maintenance problems and rapidly detecting defective equipment.
10. Producing interactive services (such as reading documents by videophone and using it with a videocassette recorder) that may be marketed.

11. Designing a local video communications network (videophone + videoconference).

Exercise 4. Read the following text carefully.

Many large companies, or groups working on the same site, are being faced with the choice of continuing with their own PABXs, which may be electromechanical or electronic, or of installing a LAN. Installing a LAN is certainly very expensive but it offers a great variety of advantages over a PABX. Suppliers of LANs have been offering systems based on two major classes of architecture, the ring and bus topologies.

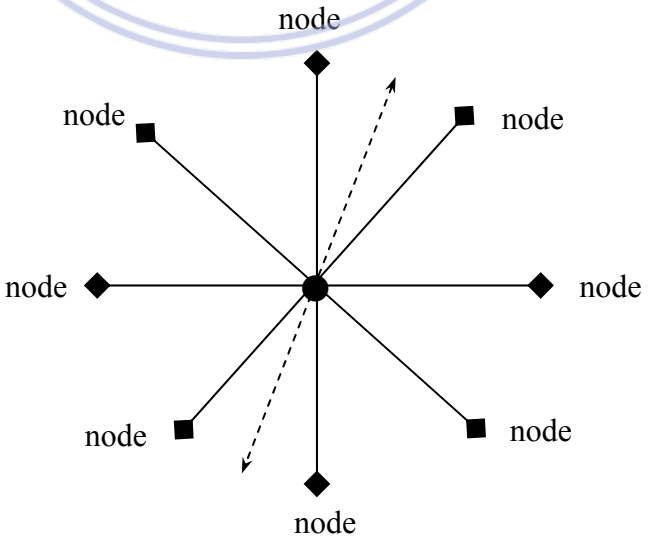


The ring and bus topologies.

(CPU = Central Processing Unit)

A third solution that is also sometimes suggested is based on the classic star network, in which central processor controls all other nodes in a master/ slave manner.

The star network



The star network

The central processing unit (CPU) in ring and bus topologies can be located anywhere in the network, making for truly decentralized processing/ whereas it control every operation in star network. In contrast to LAN suppliers, the effort of PABX suppliers has been placed, for the main part, on replacing electromechanical systems with modern, electronic PABXs where the customer's requirements have been almost exclusively for voice-only systems. The late entry of PABX suppliers into the OA market has been seen by many as the chasing of a new expanding market with "second best" technology.

So which is the better for the office: a PABX or a LAN system?

A lot of obviously depends on the size and specific needs of each company, but LAN topology and architecture seem to be more suitable for levels one and two because of the very high data rates, high occupancy and transaction that are involved. PABXs, on the other hand, seem to be more suitable for levels three and four, where communication over longer distances is required.

Other arguments in favour of the PABX are that most people are already familiar with it and know how to use all its facilities. A PABX can normally be easily upgraded through software modifications to provide new facilities for the office of the future. It also offers full access to all national telecommunication services and an electronic PABX gives the user features such as call detail recording. The PABX has single wire connectivity and cabling probably already runs from the PABX to every workstation in the company. A final argument is that most users have limited budget and prefer to continue with a technology that has been tried and tested, especially as they consider that voice traffic, rather than data, will remain the dominant form of communication.

The principal argument in favour of LANs is their ability to handle large amounts of data at high speed. Also their networks, either ring or bus, require less cabling than the star networks of PABXs, and LANs offer distributed control rather than the very centralized systems provided by PABXs. This gives LANs more power and flexibility. It is also easier to share specialized resources with a LAN and different terminals can be connected more economically than on a PABX. Finally, the LAN frees the PABX for other functions.

Against the LAN, we can argue that it is costly to install; it is limited in communications distance; there is a lack of privacy and a relatively small bandwidth; and it can only accommodate a limited number of terminals. For some operations a LAN may also be less reliable than a PABX. An enormous market for office automation is opening up.

Since LANs appears to be particularly well-suited to the electronic office, they will certainly continue to develop in different forms using transmission media (coaxial cable and /or optical fibres) which meet the specific requirements and technical possibilities of individual companies in terms of architecture and investment.

A. Write True (T) or False (F) for each sentence. If false, say what is true.

1. A PABX can normally be easily upgraded through software modifications to provide new facilities for the office of the future.
2. Most people are already familiar with PABX and know how to use all its facilities.
3. Most people are already familiar with LAN and know how to use all its facilities.
4. Installing a PABX is certainly very expensive but it offers a great variety of advantages over a LAN.

5. LANs offer distributed control rather than the very centralized systems provided by PABXs.
6. Against the LAN, we can argue that it is costly to install.
7. The principal argument in favour of PABXs is their ability to handle large amounts of data at high speed.
8. Suppliers of LANs have been offering systems based on three major classes of architecture, the ring, bus and star topologies.
9. The central processing unit (CPU) in ring and bus topologies can be located anywhere in the network.
10. LANs appears to be particularly well-suited to the electronic office.

B. Answer the following questions.

1. What are the two major classes of LAN architecture?

   .....

2. What market have PABX suppliers been aiming at, according to the text?

   .....

3. Give five possible advantages of a PABX over a LAN.

   .....

4. Give six possible advantages of a LAN over a PABX.

   .....

5. What do the following acronyms mean: CPU, OA, DDP.

   .....

UNIT 3

Exercise 1. Complete the sentences, basing on the text.

TRANSMISSION TECHNOLOGY

Most transmission - at least most transmission in the local exchange plant - is analog in nature. That is, the signal being transmitted varies continuously, both in frequency and in amplitude. A high-pitched voice mostly contains high frequencies; a low-pitched voice contains low frequencies. A loud voice contains a high-amplitude signal; a soft voice contains a low-amplitude signal.

In the long-distance network, and more and more in the local exchange plant, digital transmission is being used. A digital signal is comprised of a stream of 1s and 0s that portray the analog voice signal by means of a code.

Analog signals can be combined (i. e., multiplexed) by combining them with a carrier frequency. When there is more than one channel, this is called frequency division multiplexing (FDM). FDM was used extensively in the past but now has generally been replaced with the digital equivalent: time division multiplexing (TDM). The most popular TDM system is known as tier 1 (T1). In a T1 system, an analog voice channel is sampled 8.000 times per second, and each sample is encoded into a 7-bit byte. Twenty-four such channels are mixed on these two copper pairs and transmitted at a bit rate of 1.544 megabits per second. T1 remains an important method of transmitting voice and data in the PSTN.

1. A high-pitched voice mostly contains.....
2. A low-pitched voice contains.....
3. A loud voice.....
4. A soft voice.....
5. A digital signal is comprised of.....
6. In a T1 system, an analog voice channel is sampled.....
7. Most transmission in the local exchange plant is.....
8. FDM was used extensively in the past but now has generally been replaced with.....
9. In a T1 system, each sample is encoded into.....
10. The most popular TDM system is known as.....

Exercise 2. Fill in the blanks with suitable words.

Internet	*network*	*voice*	*digital*
signal	*switching*	*packet*	*data*

A talking path (i.e., a switched circuit) in the PSTN can be either analog or .....(1) or a combination thereof. In fact, a digital signal can be transmitted over a packet-switched network as easily as a circuit-switched .....(2). Now if we consider the next step, we see that digitized voice is not very different from .....(3), and if data can be

transmitted over a packet network, then so can digitized voice. This, of course, is now known as voice over the .....(4).

The challenge, of course, is to get the transmitted .....(5) to the destination fast enough. After all, this may well be a time sensitive .....(6) conversation. A second challenge is to get each .....(7), which is a small piece of a voice conversation, to the destination in the proper order. Progress is being made, and we can well believe that packet .....(8) will play an important role in the PSTN of tomorrow.

Exercise 3. Read the sentences about ATM carefully then give the full form of the verbs in brackets.

ATM

1. Asynchronous transfer mode (ATM) ..... a high-performance switching and multiplexing technology that utilizes fixed-length packets to carry different types of traffic. (be)
2. Information ..... into fixed-length cells consisting of 48 bytes (8 bits per byte) of payload and 5 bytes of cell header. (format)
3. The fixed cell size .....that time-critical information (e.g., voice or video) is not adversely affected by long data frames or packets. (guarantee)
4. Of course, if the cells were longer in length the system ..... more efficient, because the header would take up a smaller percentage of the total cell. (be)
5. Multiple streams of traffic can ..... on each physical facility and can be managed so as to ..... the streams to many different destinations. (multiplex; send)
6. This ..... cost saving through a reduction in the number of interfaces and facilities required to construct a network. (enable)

Exercise 4. Read the following text carefully.

METALLIC CABLE SYSTEMS

Whichever technique we use, whether analogue or digital, some suitable medium is required to transmit the speech. It is usual to differentiate between four groups of such *transmission media:*

- Metallic cable systems
- Radio link systems
- Satellite systems
- Optical fibre systems

The following passage considers the metallic cable systems.

There are two main types of these: *paired cables* and *coaxial cables*. *Open wire* systems may also be used in sparsely populated areas. Metallic cables can be used for both analogue and digital speech channels.

The simplest form of paired cables is to be found at home. This is the "cable" to the telephone socket, in which only two wires are actually used. But there are more to choose from in

the telephone administration's stores; cables with 2, 10, 100 and 500 pairs inside are some of them. Paired cable is mainly used between subscribers and the exchange, but may also be used between exchanges in the network.

Coaxial cables also come in different designs and dimensions, but with the same construction principles: one conductor in the centre, surrounded by an outer tube-like conductor. There are thus only two conductors in the cable, but their higher bandwidth makes them suitable for multi-channel transmission (FDM or TDM).

Coaxial cables are used primarily for transmission between exchanges, and are used in pairs, one for each transmission direction.

Copper cables

A. Answer the questions.

1. How many types of metallic cable are there? What are they?

.....

2. Can metallic cable be used for both analogue and digital channels?

.....

3. Where are open wire systems used?

.....

4. Describe the construction of a coaxial cable.

.....

5. What are some differences between paired cables and coaxial cable?

.....

(e.g. transmission capacity, where they are used)

6. What do the initials FDM and TDM stand for?

.....

B. Rearrange the letters to make correct words.

OCAXALI	HEXEANGC
ECHNANL	EDICTRION
OCUODCNTR	WNTORKE

UNIT 4

Exercise 1. Read the following text carefully.

Optical fiber is unquestionably the transmission medium of choice. Whereas transmission over copper utilizes frequencies in the megahertz range, transmission over fiber utilizes frequencies a million times higher. This is another way of saying that the predominant difference between electromagnetic waves and light waves is the frequency. This difference, in turn, permits transmission speeds of immense magnitudes. Transmission speeds of as high as 9.9 Gbps have become commonplace in the industry today. At this speed, the entire fifteen-volume set of Encyclopedia Britannica can be transmitted in well under one second.

Laying fiber, on a per-mile basis, still costs somewhat more than laying copper. However, on a per-circuit basis there is no contest; fiber wins hands down. However, if a local loop is being laid to a residence, there is little justification to installing fiber - there will never be a need for more than one or two or three circuits. This realization has led to a transition in our thinking.

Shortly after the commercialization of fiber, we talked about fiber-to-the-home (FTTH). It was then realized that there was little need to install fiber for a final several hundred yards, so the industry shied away from fiber-to-the-curb (FTTC). In such a system, fiber would carry a plurality of channels to the "curb", whereupon they would be broken down and applied to the copper drop leading to the home. In many cases even this was overkilled and fiber-to-the-neighborhood (FTTN) is now being used. The message is clear: apply fiber when it is economical to do so, and otherwise rely on copper.

A. Find out the mistakes in the sentences and correct them, basing on the text.

...	1. Transmission over fiber utilizes frequencies a hundred times higher than that over copper.
...	2. The predominant difference between electromagnetic waves and light waves is the speed.
...	3. The difference in frequency prevents transmission speeds of immense magnitudes.
...	4. At the speed of 9.9 Gbps, the entire fifteen-volume set of Encyclopedia Britannica can be transmitted in well under one minute.
...	5. Laying fiber, on a per-mile basis, costs much less than laying copper.
...	6. Shortly after the commercialization of fiber, we talked about fiber-to-the-curb.
...	7. In fiber-to-the-home systems, fiber would carry a plurality of channels to the "curb".
...	8. Fiber-to-the-neighborhood is not used any more.
...	9. The message is apply fiber in any cases.

B. Give the full form of the words.

FTTN: ..... FTTH: .....

FTTC: ..... Gbps: .....

Exercise 2. Read the following text about SONET then fill in the sentences with the appropriate form.

SONET

1. SONET is a standard for ..... telecommunications transport. (optic)
2. The SONET standard is expected to provide the transport infrastructure for ..... telecommunications for at least the next two or three decades. (world)
3. It defines a technology for carrying many signals of ..... capacities through a synchronous optical hierarchy. The standard specifies a byte-interleaved multiplexing scheme. (differ)
4. The SONET standards govern not only rates, but also interface parameters, formats,..... methods; and operations, administration, maintenance, and provisioning (OAM&P) for high-speed ..... (multiplex; transmit)
5. We most often hear of SONET rings in which fiber strands are ..... around a metropolitan area in a ring configuration. (string)
6. The system is ..... so that transmission can take place in either direction; should there be a fault at any one location, transmission will ..... take place in the opposite direction. That is, the system is self-healing. (designed; immediately)

Exercise 3. Read the following text about optical fibres then fill in the blanks with the most suitable given words.

smaller	*bandwidth*	*messages*	*less*	*light*	
metal	*robots*	*optical*	*repeaters*	*easier*	*voice*

Optical fibre, the use of light rather than electronics, is the oldest form of communications known to man. Two thousand years ago, (1) ..... were sent by lighting fires. From that time on, numerous methods have been devised to send messages by (2) ..... until the 1800s when electronic communications became popular. Now, this has changed. Late in 1981 Telecom Australia installed the first data link using (3) ..... fibre. This happened in Sydney and it marked the beginning of a new era in communications in Australia.

Today optical fibre is used extensively. Lines are (4) ....., lighter and more flexible than equivalent metal cables. This means they are (5) ..... to install and they occupy (6) ..... space in cable ducts. A single fibre is only 0.9 mm across.

They have very low losses compared with (7) ..... cables. On most routes it is possible to do without repeaters except in exchanges. When metal cables are used, it is often necessary to install (8) ..... in manholes in the street.

But the biggest advantage of optical fibre is undoubtedly its (9) ..... With current technology it is routine for a single fibre to carry a full video signal 10 km, or eight video signals 4 km. Alternatively 1920 telephone channels can be carried 10 km or 7680 carried 4 km. All on a cable less than a millimetre across.

In Australia, Telecom has been using optical fibre on main trunk routes since 1983, when the Melbourne exchanges of Dandenong and Exhibition were linked. Melbourne and Sydney will

be linked by 1989 by a 30-fibre cable giving a total capacity for 60,000 (10) ..... channels. The existing coaxial cable has a 9000 voice channel capacity.

Other uses are being found for optical fibre as price comes down. Aerospace designers are using it in aircraft. Mechanical engineers use it on assembly lines to control (11) .....

Exercise 4. Match the two columns to make complete sentences.

THE DESIGN OF FIBER: CORE AND CLADDING

An optical fiber consists of two different types of highly pure, solid glass to form the core and cladding. A protective acrylate coating then surrounds the cladding. In some cases, the protective coating may be a dual layer.

Standard single-mode fibers are manufactured with a small core size, approximately 8 to 10 μm in diameter. Multimode fibers, with core sizes of 50 to 100 μm in diameter, are used for specific applications, such as short-distance transmission of data. With its greater information-carrying capacity and lower intrinsic loss, single-mode fiber is typically used for longer distance and higher-bandwidth applications.

1. An optical fiber consists of	a. surrounds the cladding.
2. A protective acrylate coating	b. the core and cladding.
3. The protective coating	c. may be a dual layer.
4. Standard single-mode fibers are manufactured	d. are used for specific applications.
5. Multimode fibers	e. is typically used for longer distance and higher-bandwidth applications.
6. Single-mode fiber	f. with a small core size.

Exercise 5. Read the text then answer the questions.

HOW TO CHOOSE OPTICAL FIBER

The key optical performance parameters can vary significantly among fibers from different manufacturers, in ways that can affect your system's performance. It is important to understand how to specify the fiber that best meets system

Attenuation

Attenuation is the reduction of signal strength or light power over the length of the light-carrying medium. Fiber attenuation is measured in decibels per kilometer (dB/ km).

Optical fiber offers superior performance over other transmission media because it combines high bandwidth with low attenuation. This allows signals to be transmitted over longer distances while using fewer regenerators (amplifiers), reducing cost, and improving reliability.

Dispersion

Dispersion is the smearing or broadening of an optical signal that results from the many discrete wavelength components traveling at different rates. In digital transmission, dispersion limits the maximum data rate or information-carrying capacity of a single-mode fiber link. In analog transmission, dispersion can cause a waveform to become significantly distorted and can result in unacceptable levels of composite second-order distortion (CSO).

1. What is attenuation?

.....

2. How is fiber attenuation measured?

.....

3. Why does optical fiber offer superior performance over other transmission media?

.....

4. What does this combination allow the signals to do?

.....

5. What is dispersion?

.....

6. What does dispersion do in digital transmission?

.....

7. What can dispersion do in analog transmission?

.....

Exercise 6. Fill in the blanks with suitable form of the suggested words.

enable	*base*	*digitalize*	*carry*
be	*improve*	*understand*	*provide*

FIBER-OPTIC TECHNOLOGY

Fiber-optic communications is ..... (1) on the principle that light in a glass medium can ..... (2) information over longer distances then electrical signals can carry in a copper or coaxial medium. The glass purity of today's fiber, combined with improved electronic systems, ... 3. fiber to transmit ..... (4) light signals well beyond 100 km (60 miles) without amplification. With few transmission losses, low interference, and high bandwidth potential, optical fiber .....(5) an almost ideal transmission medium.

The advantages ..... (6) by optical fiber system are the result of a continuous stream of product innovations and process improvements.

As the requirements and emerging opportunities of optical fiber system are better ..... (7), fiber is ..... (8) to address them.

Exercise 7. A. Classify the following nouns as either COUNTABLE (C) or UNCOUNTABLE (U).

1.	Telephone call	...	7.	Security	...
2.	Repeater	...	8.	Interference	...
3.	Information	...	9.	Crosstalk	...
4.	Data	...	10.	Space	...
5.	Duct	...	11.	Capacity	...
6.	Cable	...	12.	Equipment	...

B. Complete these sentences, using "much more" or "much less".

1. Optical fibres carry_____ _____ information than conventional cables.
2. _____ _____ telephone calls can be transmitted using optical fibre.
3. _____ _____ data can be transmitted using conventional cables.
4. You hear _____ _____ crosstalk using optical fibre.
5. There is _____ _____ interference on copper cables.
6. Optical fibres occupy _____ _____ space.
7. You need _____ _____ ducts or cable pipes with optical fibre.
8. Conventional cable has _____ _____ capacity than optical fibre.
9. Conventional cable cost _____ _____ to produce in the past than optical fibre.
10. You need _____ _____ equipment, such as repeaters, on a copper cable line.

Exercise 8. Read the following text carefully.

FIBER GEOMETRY PARAMETERS

The three fiber geometry parameters that have the greatest impact on splicing performance are the following:

- **cladding diameter** - the outside diameter of the cladding glass region.
- **core/ clad concentricity (or core-to-cladding offset)** - how well the core is centered in the cladding glass region.
- **fiber curl** - the amount of curvature over a fixed length of fiber.

These parameters are determined and controlled during the fiber-manufacturing process. As fiber is curled and spliced according to needs dictated by each individual system, it is important to be able to count on consistent geometry along the entire length of the fiber and not to rely solely on measurements made only at the end of the fiber.

Cladding Diameter

Cladding diameter tolerances control the outer diameter of the fiber, with tighter tolerances ensuring that fibers are almost exactly the same size. During splicing, inconsistent cladding diameters can cause cores to be misaligned where the fibers join, leading to higher losses.

Cladding diameter tolerances are controlled by the drawing rate. Some manufacturers are able to control the tolerance of the cladding to a level of 125.0 ± 1.0 μm. Once the cladding diameter tolerance is tightened to this level, core/clad concentricity becomes the single largest geometry contributor to splice loss.

Core/ Clad Concentricity

Tighter core/ clad concentricity tolerance help ensure that the fiber core is centered in relation to the cladding. This reduces the chance of ending up with cores that do not match up precisely when two fibers are spliced together. A core that is precisely centered in the fiber yields lower-loss splices more often.

Core/ clad concentricity is determined during the first stages of the manufacturing process, when the fiber design and resulting characteristics are created. During these laydown and consolidation processes, the dopant chemicals that make up the fiber must be deposited with

precise control and symmetry to maintain consistent core/ clad concentricity performance throughout the entire length of fiber.

Fiber Curl

Fiber curl is the inherent curvature along a specific length of optical fiber that is exhibited to some degree by all fibers. It is a result of thermal stresses that occur during the manufacturing process. Therefore, these factors must be rigorously monitored and controlled during fiber manufacture.

Tighter fiber-curle tolerances reduce the possibility that fiber cores will be misaligned during splicing, thereby impacting splice loss.

Typical mass fusion plicers use fixed v-grooves for fiber alignment, where the effect of fiber curl is most noticeable.

A. Read the text then match the two columns to make phrases.

• manufacturing	• concentricity
• fiber	• design
• fiber	• alignment
• fiber	• rate
• core/ clad	• diameter
• fiber	• core
• cladding	• process
• drawing	• parameters
• outer	• curl
• geometry	• diameter

B. Decide whether these statements are true or false. If false, say what is true.

1. Cladding diameter - the amount of curvature over a fixed length of fiber.
2. Core/ clad concentricity - how well the core is centered in the cladding glass region.
3. Fiber curl - the outside diameter of the cladding glass region.
4. Core-to-cladding offset - Core/ clad concentricity
5. Cladding diameter tolerances control the inner diameter of the fiber.
6. A core that is precisely centered in the fiber yields lower-loss splices more often.
7. During splicing, inconsistent cladding diameters can cause cores to be misaligned where the fibers join.
8. The drawing rate is controlled by cladding diameter tolerances.
9. Tighter fiber-curled tolerances increase the possibility that fiber cores will be misaligned during splicing.
10. Typical mass fusion plicers use fixed v-grooves for fiber alignment.

Exercise 9. Read the following text carefully.

A. Fill in each blank with ONE suitable given word.

issues	*manufactured*	*loss*	*installed*	*tests*
fiber	*expectancy*	*safely*	*inches*	*designed*

Life expectancy

Fiber is designed and ..... to provide a lifetime service of 20 years or more, provided it is cabled and ..... according to recommended procedures. Life ..... can be extrapolated from many ..... These test results, along with theoretical analysis, support the prediction of long service life.

Environmental ..... are also important to consider when evaluating a fiber's mechanical performance.

Bending Parameters

Optical ..... cable is easy to install because of its light weight, small size, and flexibility. Nevertheless, some people new to fiber express concern over the precautions required to avoid too-tight bends, which can cause ..... of light or premature fiber breakage.

Experience and testing show that bare fiber can be ..... looped with bend diameters as small as two ....., the recognized industry standard for minimum-bend diameter. Splice trays and other handling equipment, such as racks, are ..... to prevent fiber-installation errors.

B. Match the two columns to make phrases.

• test	• size
• light	• errors
• small	• breakage
• fiber	• equipment
• environmental	• trays
• splice	• life
• handling	• results
• fiber-installation	• weight
• service	• issues

UNIT 5

Exercise 1. Fill in the blanks with suitable words from the box.

using	rates	technology	coding	modem
Internet	digital	low	applications	signals

ADSL

Asymmetric (1)..... subscriber line (ADSL) is, essentially, a (2)..... that employs a sophisticated coding scheme. This (3)..... scheme permits transmission over copper pairs at (4)..... as high as 6 Mbps for distances of 9.000 to 12.000 feet. Speeds of this magnitude bring to mind television (5).....; a 6-Mbps channel can easily handle a television movie.

ADSL succeeds because it takes advantage of the fact that most of its target (6)..... (video-on-demand, home shopping, (7)..... access, etc.) function perfectly well with a relatively (8)..... upstream data rate - hence the word *asymmetric*. LECs are now (9)..... ADSL as an access (10)..... for their television businesses and for Internet access.

Exercise 2. Read the following text. Find the events the figures refer to.

HISTORY AND REGULATION OF THE TELEPHONE INDUSTRY

"Mr. Watson, come here, I want you." With these historic words Alexander Graham Bell called to his assistant Thomas Augustus Watson over the so-called "telephone" and an industry was born.

The place: 5 Exeter Place, Boston, Massachusetts

The time: evening, March 10, 1876

On July 9, 1877, the Bell Telephone Company was formed, and Alexander Graham Bell became the company's electrician, at a salary of $3,000, and Watson became superintendent in charge of research and manufacturing. Unfortunately for Bell, the basic patents were due to run out in 1893 and 1894. But by this time, Theodore Newton Vail had been brought in as general manager, and he immediately set about establishing an organization strong enough to survive without a monopoly.

Vail also sent his salesmen into the field to set up telephone exchanges in virgin territory. Generally, local promoters were encouraged to organize a local telephone company and sell stock. Thus, by 1885 Vail had established a vertically integrated supply division, a network of companies licensed by the parent, and a strong research and development arm. The expiration of Bell's basic patents in 1893 and 1894 was the starting signal for open competition. Independent telephone operating companies sprang up throughout the country; by the turn of the century there were approximately 6,000 of them, and these 6,000 provided service to some 600,000 subscribers.

Through the years, mergers and acquisitions took their toll; at the present time there are approximately 1,300 local exchange carriers.

Unfortunately for the general public, all of these telephones were not interconnected. Therefore, it was necessary for a subscriber to have two or three instruments to communicate with the total population of the city. However, the great asset of AT&T, which became the official name of the company at the end of 1899, was the control of all the long-distance circuits and steadfast refusal to interconnect any other company to it.

1. July 9, 1877	……
2. $3,000	……
3. March 10, 1876	……
4. 1893 and 1894	……
5. 6,000	……
6. 5	……
7. 1899	……
8. 1,300	……
9. 600,000	……

Exercise 3. A. Read the following text then answer the questions.

VIETNAM TELECOMMUNICATION ENTERS THE 21ST CENTURY

The telecommunications is considered one of the most important infrastructure industries of the national economy and also an effective measure for the leadership of the Party and State. So that, the State has given priority and affiliated for its development to access international standards with these following objectives:

- In the coming 10 years, the development speed of telecommunications industry must be doubled to the general speed of the national economy.

- After the year 2000, the telephone density must reach 3.8 to 4 sets/ 100 inhabitants, almost villages nationwide have the telephone service. The telecommunication revenue will be about 1 billion USD.
- By the year 2010, the telephone density will reach 12-15 sets/ 100 inhabitants, more than 50% households own telephones. The telecommunication revenue will be 2 - 3 billion USD.
- By the year 2020, the telephone density will reach 20 - 25 sets/ 100 inhabitants, more than 75% households own telephones. Telecommunications services can satisfy all customer demands regardless of location and time, in cities or remote areas.

DGPT has also planned to build the national communication infrastructure to meet these following demands:

- Advanced technology and bandwidth to assist multimedia applications and e-commerce.
- Ready and high access ability, both in economy and physical (users can access to this national communication infrastructure regardless of their locations with reasonable price).
- High safety to assist e-commerce and globalisation trends of the global economy. It must create a convenient environment for activities of all businesses.
- High unity and compatibility with the regional communication infrastructure. Users can easily use both domestic and international services.

(From an interview with Mr. Le Nam Thang - Director of DGPT's Policy Department)

1. What is telecommunications considered to be in Vietnam?

……

2. How many objectives has the State affiliated for telecommunications sector's development to access international standards? What are the third and the fourth adjectives?

……

3. What are the first two demands DGPT has also planned to build the national communication infrastructure to meet?

……

B. Translate the text into Vietnamese.

Exercise 4. Reading text

POLICIES SET FOR THE DEVELOPMENT
OF THE TELECOMMUNICATIONS IN VIETNAM

There are 3 main policies: market opening, equitisation and services popularisation.

Market opening is a very important policy because Vietnam has officially entered some regional and international organisations such as: ASEAN, APEC and, in the future, WTO. Almost member countries of these organisations are followed the model of market economy with high competition. Their companies and businesses are very experienced of operating in competition

environment. In this background, Vietnam also needs to allow for competition to make its companies and businesses get used to competition and development in competition environment. We need to actively develop our resources, especially the human resource, enhancing our competition ability to successfully integrate to regional as well as international economies.

However, the market opening also needs to be implemented on a scientific approach suitable with our conditions and each development stage. This approach follows up the rule: firstly, introduce competition to domestic telecommunications services then international ones: similarly, first to value added services then basic ones: mobile services then fixed ones. To carry out this policy, a the moment, DGPT has opened the local telephone, mobile communication and Internet market, specifically besides VNPT, two more telecommunications operators have been licensed (SPT and VIETEL); in the Internet market, there are 1IAP and 5 ISPs.

The second policy is equitisation. To bring into full play all international forces, the States has set up policies to encourage the participation of economic sectors in developing the telecommunications industry. To mobilise capitals from different economic sectors, the Government has allowed to equisite some state-owned companies and businesses in P&T industry. Staff of these companies and businesses are given priority to buy stocks of their companies. This gives conditions for labourers become the owners of their companies and so that it is easy to raise the effectiveness of these companies and businesses. Through the equitisation process, DGPT also encourages different economic sectors to participation in building the national communication infrastructure and services applications.

The third policy is service popularisation. One of the objectives of telecommunication development in our country is to create diversified, qualified services to meet the demands of customers regardless of place and time. To carry out these objectives, all telecommunications businesses must have the duty to contribute to the development of communication infrastructure in remote areas, where the trading is non-profitable. This policy sets up the justice and ensures fair competition between P&T businesses and users' benefits.

In the past, only VNPT had the duty of universal service obligations. But at the moment, under enforced regulations, all telecommunications operators, VNPT, SPT and VIETEL, have the duty of services popularisation. DGPT is also considering of setting up a general service popularisation policy suitable with certain development stage as well as the level of market opening, together with the creation of a service popularisation fund.

(From an interview with Mr. Le Nam Thang - Director of DGPT's Policy Department)

A. Decide whether these ideas are related to market opening (MO), equitisation (EQ) or service popularisation (SP)

1. All telecommunications operators, VNPT, SPT and VIETEL, have the duty of services popularisation.
2. The equisitation of some state-owned companies and businesses in P&T industry
3. The opening of the local telephone, mobile communication and Internet market, specifically besides VNPT.
4. The active development on our resources, especially the human resource, enhancing our competition ability to successfully integrate to regional as well as international economies.
5. The priority given to companies and businesses' staff in buying stocks of their companies

6. The participation of different economic sectors in building the national communication infrastructure and services applications
7. The contribution to the development of communication infrastructure in remote areas, where the trading is non-profitable
8. The implementation on a scientific approach suitable with our conditions and each development stage
9. The creation of diversified, qualified services to meet the demands of customers regardless of place and time

B. Answer the questions.

1. How many main policies were set for the development of the telecommunications in Vietnam? What are they?

……

2. Why is market opening a very important policy?

……

3. Who had the duty of universal service obligations in the past?

……

4. Who have the duty of universal service obligations now?

……

C. Translate the passage into Vietnamese.

Exercise 5. Fill in each blank with one suitable given word.

speech	*subscribers*	*defines*
telecommunication	*switching*	*telephone*
information	*outlet*	*connection*

What is meant by (1).....? One answer to this question might be "to set up a (2)..... between two telephone (3)..... so that they can talk to each other". While this is certainly true, we need a more general description.

The ITU-T (4)..... switching as: "the establishing, on demand, of an individual connection from a desired inlet to a desired (5)..... within a set of inlets and outlets for as long as is required for the transfer of (6).....".

Today, the word "information" not only denotes the (7)..... we hear in our (8)..... receiver, but also incorporates all types of information from several (9)..... services.

Exercise 6. Read the text then answer the questions.

In days of old there was only one long-distance carrier - AT&T. Hence, any time a telephone number was dialed with an area code up-front, the LEC knew that it must be handed off to AT&T. But then came MCI, Sprint, and hundreds of other long-distance carriers. What was an

LEC to do with a particular long-distance call? To whom should it be handed off? This was and is a technical challenge.

In political terms, it was called “equal access,” which means that a requesting long-distance carrier could require that the LEC examine the number and handoff the call to the proper long-distance carrier. This handoff was from the CO of the LEC to the point of presence (PoP) of the IXC. This PoP could be in a building adjacent to the telco's CO, or it could be in some convenient site in the suburbs where it could serve several of the telco's COs. The pure hierarchy of switching systems was becoming somewhat corrupted; new hierarchies in the long-distance part of the network were being applied on top of the old one.

Questions:

1. How many long distance carriers were there in the past?

.....

2. What was its name?

.....

3. Mention two other long-distance carriers which came later?

.....

4. What does “equal access” mean?

.....

5. Where was the handoff from and to?

.....

6. Where could the PoP be?

.....

7. Was that pure hierarchy of switching systems convenient nowadays?

.....

UNIT 6

Exercise 1. Complete the sentences, using the words in the box.

communication	speaking	call	put	number
hold	could	extension	back	engaged
message	moment	this	sorry	

1. I'll ……..... back later.
2. The line's busy. Will you ……..... ?
3. Could you hold on a ..... and I'll get a pen.
4. My new …..... will be 071.335.2378.
5. ..... I leave a message?
6. May I have …..... 3285, please?
7. Good afternoon. Paul Moran .....
8. I'll ask Mr. Travers to call you ……..... as soon as possible.
9. Would you like me to take a .....
10. Could you ……..... me through to Miss Nixon, please?
11. Good morning, ... is Richard Bowers.
12. I'm ....., but Mr. Laws is away all week.
13. The line is …..... Can I ask her to call you back?
14. One of the keys to successful management.

Exercise 2. Read the following text carefully then choose the right answers.

SWITCHING TECHNOLOGY

The PSTN we have been describing has a star configuration. Local loops (usually one per subscriber) terminate in a CO. This CO completes connections from one local loop to another local loop, or from one local loop to a trunk that terminates technological changes.

The manual system required, of course, constant attention from operators. In the late 1800s, telephone calls were connected manually at the CO. When a call came in, an attendant would plug into a horizontal bar line. He then would yell to the operator who handled the bar and finish setting up the call. When the call was completed, another operator would yell to all in the room that the line was clear again. The step-by-step system, which is still in operation in many parts of the country, utilized what is known as the Strowger switch. The intelligence in the system was located in relays mounted on each switch. The switch itself responded to the dial pulses of the rotary dial.

The crossbar system was still electromechanical in nature, but the intelligence of the system was separated from the actual switch. Thus, this common control could be used repeatedly to set up and tear down calls and never sit idle.

When electronic came along, the electromechanical control of the common control system was replaced with electronics, and the network, or matrix, was usually replaced with tiny glass - encapsulated reed switches. Hence only a part of the switch was electronic. In the next generation, the stored program operation of a digital complex of reed switches. In the final generation, called a digital switch, the talking path was no longer an electrically continuous circuit; rather the speech being carried was digitized into a stream of "1s" and "Os". Notice that this final generation depicted a significant change from the previous generations in that there was no longer an electrical talking path through the switch. We were, in fact, operating in a digital (rather than analog) domain.

However, whether the system was analog or digital, one thing must be recognized: there was an actual talking path - a circuit - from the calling party to the called party. This talking path was established at the beginning of a call and held for the duration of a call. We call it circuit switching. This system is not actually efficient. When I am talking, you are listening, and the circuit is being used in only one direction - that is, 50 percent. When neither of us is talking, or when there is silence between words, the efficiency is 0 percent.

There is, however, a different kind of connection, and we see it today in a number of applications: credit-card verification; automated teller machine; SS7; Internet and the World Wide Web. This system is called packet switching (as opposed to circuit switching). In a packet-switching system, the information being transmitted (be it data or digitized voice) is not sent in real time over a dedicated circuit; rather it is stored in a nearby computer until a sufficiently sized packet is on hand. Then a very smart computer seizes a channel heading in the general direction of the destination, and that packet of data is transmitted at very high speeds. Then the channel is released. So, except for some necessary supervisory information (destination, error checking codes, etc) the channel is 100 percent efficient. When the distant station gets that message no more than a few milliseconds later, it responds with the necessary handshaking information-again, by accumulating a packet of data, seizing a channel, and bursting the information out over that channel. Again, 100 percent efficient.

As mentioned earlier, the packet networks in the world (actually overlay networks to the PSTN) are being used extensively for data; only recently are we seeing them being used for voice. As systems are perfected, this also will change.

1. What did the manual system require from operators?

a. constant attention from operators b. the rotary dial

2. How much is the efficiency when neither of the speakers is talking or when there is silence between words?

a. 50% b. 0%

3. Was the talking path an electrically continuous circuit in a digital switch?

a. Yes b. No

4. What was the speech being carried in a digital switch converted into?

a. a stream of "1s" and "Os" b. an electrically continuous circuit

5. Is the information being transmitted sent in real time over a dedicated circuit in a packet-switching system?

a. No, it is stored in a nearby computer until a sufficiently sized packet is on hand.

b. Yes, it is stored in a nearby computer until a sufficiently sized packet is on hand.

6. Mention some applications on packet switched network.

a. star configuration b. SS7, Internet and the World Wide Web

Exercise 3. Fill in each blank with one suitable given word.

cells	*fixed-length*	*high-performance*	*packets*	*interfaces*
payload	*information*	*destinations*	*multiplexed*	*types*

ATM

Asynchronous transfer mode (ATM) is a (1)..... switching and multiplexing technology that utilizes fixed-length packets to carry different (2)..... of traffic. Information is formatted into (3)..... cells consisting of 48 bytes (8 bits per byte) of (4)..... and 5 bytes of cell header. The fixed cell size guarantees that time-critical (5)..... (e.g., voice or video) is not adversely affected by long data frames or (6)..... Of course, if the (7)..... were longer in length the system would be more efficient, because the header would take up a smaller percentage of the total cell.

Multiple streams of traffic can be (8)..... on each physical facility and can be managed so as to send the streams to many different (9)..... This enables cost saving through a reduction in the number of (10)..... and facilities required to construct a network.

Exercise 4. Fill in the blanks, using suggested words in the most suitable form.

Example: It is primarily the switching equipment that limits the bandwidth of a ..... *connection*..... (connect).

One hundred and twenty years ago, (1)..... meant "an operator (2)..... two subscribers with each other". Today we view the concept of switching (3).....	switch interconnect differ

Present-day switching equipment must be capable of (4)..... more services than before, including high-quality audio, video of different quality standards, LAN-to-LAN(5)....., the transfer of large data files and new interactive (6)..... based on the cable TV network. But there is more to it than the switching of information related to the service (7)..... Information used by the network - signalling information, for example, must also be (8).....	handle communicate serve use switch

Exercise 5. Read the text then match the two columns to make words or phrases.

OPTICAL SWITCHES

It is primarily the switching equipment that limits the bandwidth of a connection. Today, we can make use of very high bit rates, up to tens of billions of bits per second (tens of Gbit/s) in optical transmission systems. However, in switching equipment, we must change over to electrical signals and considerably lower bit rates.

The next step is to use optical switching with electronic switch control. And in time, we will most assuredly have fully optical switching systems. In deed, in view of the intensive research and development that is being carried out in this area, it should not be long before the first optical space switches are commercially available.

1. band	a. signals
2. electrical	b. equipment
3. optical	c. switching
4. switching	d. switches
5. bit rates	e. available
6. space	f. width
7. commercially	

Exercise 6. Read the text then answer the questions.

STORED PROGRAM CONTROL

Our digital telephone exchanges are called SPC (stored program control), exchanges and, consequently, are controlled by software stored in a computer. The programs contain the actual intelligence, and the computer (processor) sees to it that the control functions are performed.

From the start, great expectations were attached to the success of the SPC nodes. Some expectations were met, while others were not. For instance, it was soon evident that the early system did not provide the flexibility that was wanted. The software was too complex, and the smallest intervention could lead to quite unexpected side-effects. Today, all functions are divided into well-defined blocks. Modularity, as this is called, also makes the systems less complicated to maintain or extend as required. To some extent, the system carry out troubleshooting on their own

functions, indicating what measures need to be taken - measures that in many cases can be handled form the maintenance staff's terminal. To summarise, today's SPC systems are characterised by:

- simple handling of the equipment;
- flexible structure;
- low overall cost (investment, operation, maintenance);
- extended functions/ services;
- high degree of reliability.

Questions:

1. What are SPC exchanges controlled by?

.....

2. What do the programs contain?

.....

3. Did the early system provide the flexibility that was wanted?

.....

4. What was the problem with the software?

.....

5. What are SPC systems' characteristics?

.....

UNIT 7

Exercise 1. Choose the appropriate form of the words to complete the sentences.

1. A. imagination B. imagine C. imaginative

   a. A computer is limited in its ability by the ..... of man.

   b. Some people are good at inventing..... stories.

   c. It is practically impossible to …… the speed at which a computer calculates numbers.

2. A. addition B. added C. additional

   a. Many terminals can be …… to a basis system it the need arises.

   b. It is sometimes a very …….. process getting into a computer installation for security reasons.

   c. It is sometimes very …….. to explain computer concepts.

3. A. complicated B. complicated C. complications

   a. There can be many …….. involved in setting up a computer in an old building.

   b. It is sometimes a very …….. process getting into a computer installation for security reasons.

   b. It is sometimes very …….. to explain computer concepts.

4. A. differ B. different C. difference

   a. There isn't a very big…….. in flowcharting for a program to be written in Cobol or Fortran.

   b. There are many ……. computer manufacturers today, and a buyer must be able to ……..…… between the advantages and disadvantages of each.

   c. The opinions of programmers as to the best way of solving a problem often ……. greatly.

5. A. rely on B. reliable C. reliably

   a. Computers are …….. machines.

   b. If you don't know the meaning of a computer term, you cannot always ……. an all-purpose dictionary for the answers.

   b. Computers can do mathematical operations quickly and ……. .

Exercise 2. Choose the appropriate form of the words to complete the sentences.

1. A. operator B. operations

   C. operating D. operated

   a. A computer can perform mathematical ……. very quickly.

   b. One of the first persons to note that the computer is malfunctioning is the computer …….. .

c. The job if a computer operator is to …….. the various machines in a computer installation.

d. The new machines in the computer installation are not yet …….

2. A. acceptable B. accepts C. acceptance

a. A computer is a device which ……. processes and gives out information.

b. The students are still waiting for their ……..…….. into the Computer Science program.

c. It is …… to work without a template if the flowcharts are not kept on file.

3. A. solve B. solver C. solution

a. It may take a lot of time to find a ……...…… to a complex problem in programming.

b. A computer can …….. a problem faster than any human being.

b. A computer has often been referred to as a problem …….

4. A. remarkable B. remarkably C. remarks

a. Today's computes are …….. faster than their predecessors.

b. Systems analysts will often make ……. about existing programs so as help make the operations more efficient.

c. There have been …… developments in the field of computer science in the last decade.

5. A. communication B. communicative C. communicate

a. A computer must be able to ……. with the user.

b. Fiber optics is a new development in the field of ……

c. Some people working in computer installations aren't very ……. because they are shy.

Exercise 3. Read the passage and choose the correct answer to each question.

The information on a full printed page can quickly be sent great distances by means of a facsimile transmitter. A laser beam scans the original image. What it "sees" it translates either into a series of electronic impulses which travel down telephone wires or into radio waves which are reflected off satellites to a receiving station. There the data are decoded, fed to an electronic pen.

1. The information sent by this system is carried great distances .....

a) on a printed page b) as electronic pulses.

c) on a beam of light d) as sound waves.

2. The "original image" is the same as the .....

a. printed page b. transmitter

c. laser beam d. receiving station

3. When does the laser beam come into operation?

a. Before the message is sent.

b. After the message has been transmitted.

c. Before the message is first printed.

d. After the message is decoded.

4. The final step in the transmission process described certainly must be .....

a. receiving the information at the receiving station.

b. decoding the electronic impulses.

c. printing the information on a new page of paper.

d. bouncing the message off of a satellite.

5. A major advantage of this system, according to the passage, is its .....

a. cost b. speed

c. novelty d. accuracy

Exercise 4. A. Read the telephone conversation and put the auxiliary verb into each gap.

D: Good afternoon, Apple Helpline here, I'm Damian. How can I help you?

V: Oh, at last! Hello, Damian. I (a) ..... got a terrible problem with my computer. It (b) ..... (not) working at all!

D: OK. OK. Tell me your name and your company name and describe what (c)..... happened.

V: My name's Valerie, Val actually, Valerie Marks. I (d) ..... (not) work for a company, I'm self-employed. I work at home, and I (e) ..... trying to meet an important deadline at the moment. This morning i (f) ..... working away happily when suddenly everything stopped and a message came on the screen. Then the screen went blank.

D: OK Val, (g) ..... (not) worry ! What (h) ..... the message say?

V: I can't remember exactly, because I (i) ..... (not) understand it, but I think it said something about "not enough memory".

D: It's OK, Val. I understand. Tell me, Val, (j) ..... you switched the computer off?

V: No, I (k) ..... (not). It's still on.

D: Fine, Val. Now do exactly what I say. Go to your computer, OK? Can you see a "W" in the top right-hand corner? Click on that "W" with the mouse. What (I) ..... it say? Can you read it to me?

V: It says three things. There's a list of three things. First it says...

B. Make questions about the conversation and then answer the questions.

1. Why /Val / ringing / Apple Helpline? …….....
   Because .....
2. Which / company / Val / work? .....
   She.....
3. What / doing / when / computer / stopped? .....
   She .....
4. Why / Val / not remember / message? .....
   Because .....
5. She / switched off / computer? .....
   No, ...

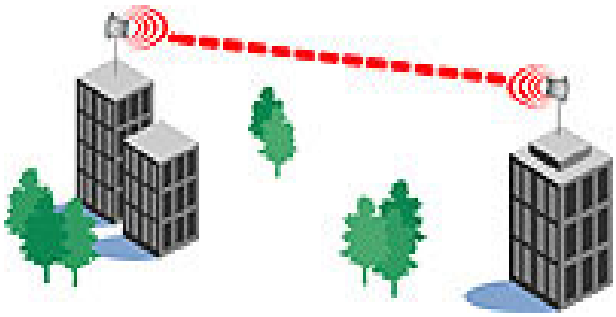
Exercise 5. Reading text

THE GOAL OF ISDN: BACKGROUND.

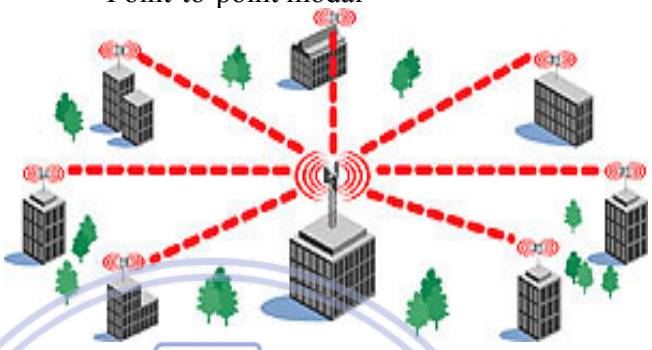
The present analog telecommunications network is based on the 4-Khz voice channel. It has served well in providing speech telephony since the 1880s. In the nineteen century the only other service was telegraph, which predated the telephone some 30 years. The two services evolved separately and distinctly. Before World War II there was some melding where telegraph and telex were carried as subcarriers on VF channels leased from telephone companies or administrations. This might be called the first move toward integrated services. However, it was probably done more for convenience and economy than for any forward thinking regarding integration.

Looking backward, telephony became ubiquitous, with a telephone in every office and in nearly every home. On the other hand, telegraphy evolved into telex but still took a backseat to telephony. Historically, facsimile was the next service that was integrated rapidly into the telephone network. Facsimile required a modem to make it compatible with analog telephony. In the office environment facsimile is often used in lieu of telex. Then in 1950s computer-related data began to emerge, requiring some method of point-to-point relay. This relay facility was carried out by the ubiquitous telephone network. Again, a modem was required to integrate the service into analog telephone network.

By this time the worldwide telephone network was in place and pervasive. Using that network turned out to be the most cost-effective method to communicate other information (i.e., other than speech telephony) from point X to point Y. Dial-up telephone connections provided one way of achieving switched service to transport that "other" information, whether point-to-point or multipoint.



Point-to-point modal



Point- to-multipoint modal

Digital telephony began to take hold after the development of the transistor in 1948. Solid-state circuitry, particularly in LSI, made pulse-code modulation (PCM) transmission and later PCM switching cost-effective.

A. Match the two columns.

1. nineteen century	a. The present analog telecommunications network is based on that voice channel.
2. In 1950s	b. The only two services were telegraph and telephone.
3. In 1948	c. Computer-related data began to emerge.
4. 30 years	d. The development of the transistor
5. 4-Khz	e. Telegraph predated the telephone.

B. Answer the questions.

1. What services evolved separately and distinctly in the nineteen century?

.....

2. What was the next service that was integrated rapidly into the telephone network?

.....

3. What did facsimile require to make it compatible with analog telephony?

.....

4. What did computer-related data require?

.....

5. What made PCM transmission and PCM switching cost-effective?

.....

Exercise 6. A. Read the text then match the numbers with the explanations.

MANAGEMENT FOR THE RIGHT DEVELOPMENT TREND

The event of inaugurating the Internet in Vietnam 2 years ago was warmly welcome. Until now, the number of Internet subscribers has continuously increased. In June, 1999 the development speed was 30% in comparison with the beginning of 1999, monthly 1,500 subscribers added to the network on average. At the moment, there are 1 IAP, 5 ISPs, 14 private networks, 16 ICPs; and over 40,000 users, excluding 15,000 users of 14 private networks. It is estimated that by the year 2000, Vietnam will have more than 100,000 Internet subscribers. This places Vietnam regulators in a very heavy duty of how to make Vietnam Internet develop on the right trend.

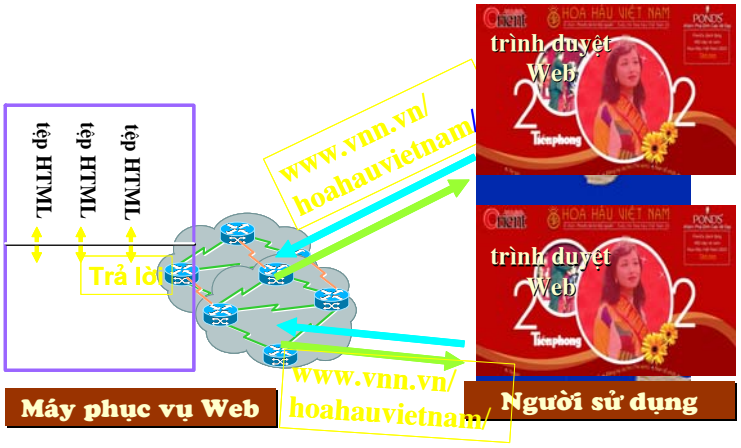
Mr. Chu Tuan Nha, Minister of Science Technology and Environment, Director of Vietnam Internet National Coordination Board, confirmed: the cooperation of ministries, sectors under the framework of the Internet National Coordination Board has brought obvious effectiveness to the development of Vietnam Internet. Although it is a new service, necessary document systems are almost enough for ensuring the right development of Vietnam Internet.

After the promulgation the 21/ CP Decree concerning the temporary regulations on establishment, management and using Internet in Vietnam; the 136/ TTg Decision relating to the establishment of the National Coordination Board, the Board quickly published a system of 10 legal documents directly related to guidance on implementing the 21/ CP Decree. These legal documents hold a very important role in creating basic legal environment for organising, managing and exploiting Internet services, which were firstly introduced in Vietnam. So that, fair competition between services providers was created.

Under the estimation of the Board, after 2 years in operation, all licensed operators (IAP, ISP and ICP) tried their best to comply with the State's regulations. Information provided on Internet has transmitted official information of Vietnam worldwide under the forms of electronic newspapers, but the diversification of information is still limited and repeated.

The safety of transmission and information on line has been paid much attention for both coming and going resources, especially the going one. However, the information management, especially the coming one, has met some difficulties because of limited ability of the firewall, not strong enough to control information with bad content. Although IAP, ISPs and ICPs for private networks were advised to set up security systems at national gateways and servers at their private gateways, the limitation of finance resource is the main reason for the above mentioned fact. Otherwise, some illegal forms of using the Internet occurred, causing difficulties for ensure the security on line.

In the coming years, Vietnam economy continues its development together with the expansion in cooperation with regional and international organisations. Activities on line, such as: e-commerce, information exchange, etc, will be increased.



1. 30% 2. 1,500 3. 1 4. 14 5. 10 6. 100,000 7. 136/ TTg 8. 40,000 9. 21/ CP	a. number of IAP at the moment b. Decision relating to the establishment of the National Coordination Board c. number of Internet subscribers Vietnam will have in 2000 d. monthly subscribers added to the network on average e. legal documents directly related to guidance on implementing the 21/ CP Decree f. the development speed in June, 1999 compared with the beginning of 1999 g. number of private networks at the moment h. Decree concerning the temporary regulations on establishment, management and using Internet in Vietnam i. number of users at the moment j. Decision relating to the establishment of the National Coordination Board

B. Translate the text into Vietnamese.

Exercise 7. Translate into English.

Để đáp ứng yêu cầu quản lý Internet Việt nam cần phải tiến hành 6 nhiệm vụ chính sau:

- Thiết lập các văn bản hoàn chỉnh cho việc phát triển Internet.
- Tiếp tục thiết lập một môi trường hợp pháp và tham gia tích cực trong việc phát triển Internet.
- Đẩy mạnh việc giám sát và đầu tư các hoạt động.
- Hỗ trợ các hoạt động của các doanh nghiệp về dịch vụ khách hàng, cho phép các kế hoạch thử nghiệm các dịch vụ mới, xem xét lại phí truy nhập Internet.

- Nghiên cứu và áp dụng các dịch vụ mới dựa trên cơ sở Internet như thương mại điện tử.
- Đẩy mạnh hợp tác quốc tế; phát triển nghiên cứu công nghệ về Internet nhằm nhanh chóng áp dụng và khai thác những công nghệ mới ở Việt nam.

Exercise 8. Fill in the blanks with suitable form of the words.

Computer telephony integration (CTI) is a term to which many are becoming..... (1. accustom). It encompasses an entire industry, devoted to the closer ..... (2. integrate) of telephony systems with computer-control devices, as well as an ever-expanding range of ..... (3. apply). At the forefront of this industry are innovative products, built using hardware able to terminate ..... (4. digit) telephony tier (T1) and E1 (T1 European equivalent) trunk interfaces, fax and voice ..... (5. process) resources, voice-over-IP (VoIP) technology, and other standard peripheral .....(6. device).

Typically, these operate in industrialized chassis housings and act as ..... (7. switch), voice-mail servers, automatic call distributors (ACDs), and nearly any other kind of telco-equipment imaginable. The CTI revolution has led to a .....(8. generate) of such equipment, upsetting traditional motions of how telephony networks should be built.

Exercise 9. Read the following text carefully.

TWISTED-PAIR SOLUTIONS FOR INTERNET ACCESS

There are three major categories of twisted-pair solutions that are being used for Internet access:

* Voice band data (VBD) modems
* ISDN digital subscriber line (DSL)
* Other DSL approaches (xDSL)

VBD modems are well known and understood by residential and small-business users. They operate be using the voice-frequency band of the twisted-pair facility to transmit data, using frequency shift keying (FSK) or quadrate amplitude modulation (QAM) transmission techniques. Symmetric rates exist up to 33.6 Kbps, with the majority running at 14.4 and 28.8 Kbps and return-path rate operating up to 33.6 Kbps.

Integrated services figural network (ISDN) is a digital baseboard technology that operates with a 144-KBPS bidirectional payload rate using 2B1Q encoding scheme. The 144 Kbps rate is divided into two 64 Kbps (B) channels and one 16 Kbps 9d channel. The B channels can be used for two separate voice calls, two 64 Kbps data calls, a separate voice and data call, or a combined 128 Kbps data call. The wire limit for ISDN is 18.000 feet of standard twisted pair.

xDSL Technologies

A variety of xDSL rates and technologies have been standardized, or are in the process of standardization, by American National Standards Institute (ANSI) and the Asymmetric Digital Subscriber Line (ADSL) Forum. The higher rates are for customers that are a short distance away from the network provider's xDSL modem. This modem may be located either in a central office (CO) or at a remote terminal site closer to many end users

ADSL

ADSL is one of several types of xDSL technologies. ADSL has two main standards: ADSL-1 specifies a downstream rate of 1.5 or 2 Mbps and an upstream rate of 16 to 64 kbps; ADSL-3 specifies a downstream rate of up to 6.144 Mbps and bidirectional channel of up to 640 kbps.

Good twisted-pair lines with no bridged taps can support ADSL-1 rates up to 18,000 feet (24-gauge wire), and ADSL-3 up to 12,000 feet.

ANSI and the ADSL Forum have endorsed discrete multitone (DMT) technology has the most marker-share thus far, with 30 times as many ADSL limes using CAP. DMT and CAP modems are incompatible, but the issue is not nearly as great as with VBD modems. VBD modems must be compatible end-to-end, from end user to end user. But ADSL modems only operate over the end user's twisted pair, from end user to network provider.

VDSL

Very-high-speed DSL (VDSL) promises even higher speeds than ADSL, although over much shorter distances. Standardization is underway in four different standards bodies: ANSI, the ADSL Forum, the ATM Forum, and the Digital Audio-Visual Council (DAVIC). There are four different technologies proposed (CAP. MDT, DIMWIT, and subscriber line charge [SLICE]), aiming at a goal of lower power and less cost than ADSL.

RADSL

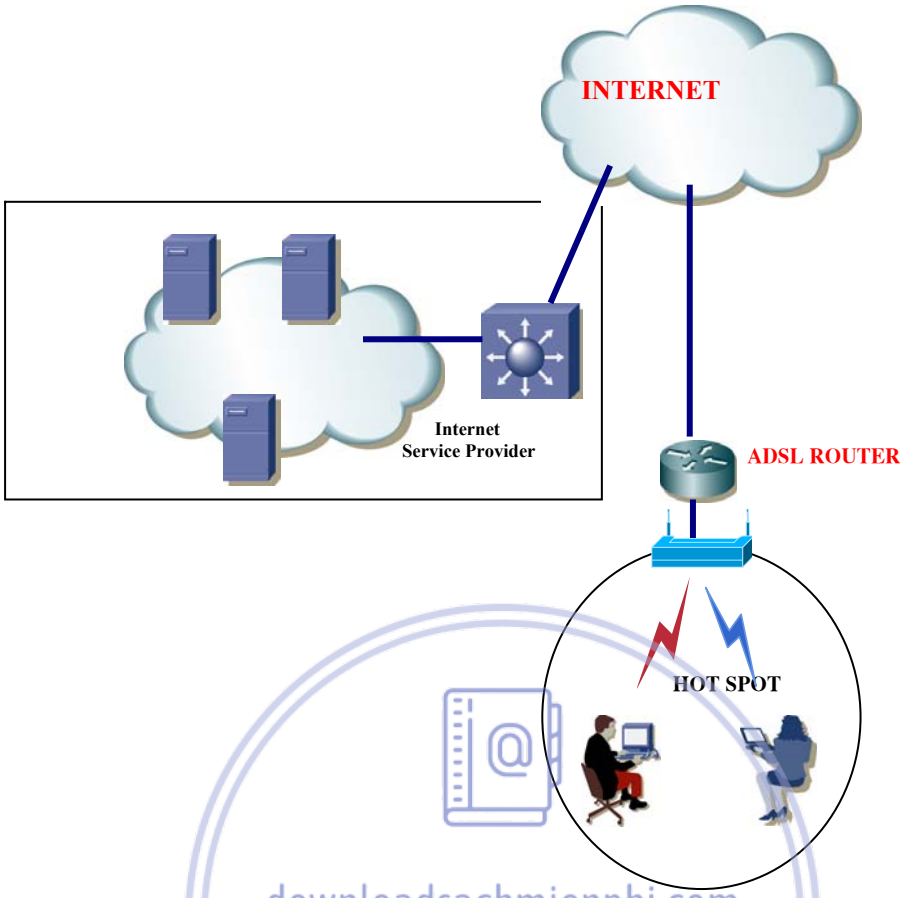
As the name implies, rate-adaptive DSL (RADSL) modems adjust the data rate to match the quality of the twisted-pair connection. Emerging software should make this an automated process with little human intervention.

HDSL and SDSL

High-data-rate DSL (HDSL) modems transmit 1.5 Mbps in each direction. Two twisted pairs of wires are used, with half of the traffic on each pair. A 2.0 Mbps transmission rate is also available, using three pairs of wires (one-third of the traffic on each pair). The wire limit is 12,000 feet (24 ga.) or 9000 feet (26 ga.).

Symmetrical digital subscriber line (SDSL) is similar to HDSL but requires only one pair of wires. Transmission speed ranges from n x 64 kbps to 2.0 Mbps in both directions.

HDSL and SDSL are intended as lower-cost replacements for dedicated T1 and fractional-T1 lines, rather than for residential access.



Transmission using ADSL

A. Give the short form for these phrases.

1. central office .....
2. gauge .....
3. Voice band data .....
4. Digital Audio-Visual Council .....
5. rate-adaptive DSL .....
6. Very-high-speed DSL .....
7. Other DSL approaches .....
8. High-data-rate DSL .....
9. subscriber line charge .....
10. frequency shift keying .....
11. quadrate amplitude modulation .....
12. Asymmetric Digital Subscriber Line Forum .....
13. American National Standards Institute .....
14. discrete multitone .....

B. Match the names with the characteristics.

a. Asymmetric Digital Subscriber Line technology

b. Rate-adaptive DSL modem
c. Very-high-speed DSL
d. Symmetrical digital subscriber line
e. Integrated services figural network
f. Voice band data modem
g. High-data-rate DSL modem

1. It is a digital baseboard technology that operates with a 144-KBPS bidirectional payload rate using 2B1Q encoding scheme.
2. It has two main standards: ADSL-1 and ADSL-3.
3. It promises even higher speeds than ADSL.
4. It adjusts the data rate to match the quality of the twisted-pair connection.
5. It operates using the voice-frequency band of the twisted-pair facility to transmit data, using frequency shift keying or quadrate amplitude modulation transmission techniques.
6. It transmits 1.5 Mbps in each direction.
7. It is similar to HDSL but requires only one pair of wires.

UNIT 8

Exercise 1. The sentences below come from two different texts. One is a written text taken from a manual about a computer's spell-check program. The other is someone telling his colleague how to use the same spell-check program.

Separate the two texts and put them in the correct order.

a. However, if errors or new words are detected they are highlighted on the screen.

b. Then you get a list of alternatives to choose from.

c. When the spell-check is finished, you go back to the document again and save it.

d. If it does find a mistake though, it picks it out from the text.

e. A list of alternative spellings is then displayed.

f. The words in the document are compared with those in the computer's dictionary.

g. Finally, the user is returned to the edited document, which may then be saved.

h. The spell-check program can be activated by clicking the mouse.

i. You select the right one and the computer changes it for you.

j. If no mistakes are found, the OK message is displayed on the screen.

k. Then the computer has a look at what you've written.

l. First of all, you use the mouse to click on to the spell-check program.

m. When the correct alternative is selected, the word is replaced automatically.

n. If everything's OK, it says it hasn't found any mistakes.

Written instructions

1: ... 2: ... 3: ... 4: ... 5: ... 6: ... 7: ...

Spoken instructions

1: ... 2: ... 3: ... 4: ... 5: ... 6: ... 7: ...

Exercise 2. Choose the appropriate form of the words to complete the sentences.

1. A. completely B. completed C. complete

   a. When you've ……. this book, you should have a basic knowledge of computers and how they operate.

   b. There are car manufacturing plants that are …….. operated by robots.

   c. A ……. microcomputer system has a microprocessor, a memory and peripheral equipment.

2. A. simplify B. simple C. simpler

   a. Microcomputers are usually …… to operate.

   b. A microcomputer may be …… to operate than a minicomputer.

   c. Using a computer to control the payroll will …… matters for many companies.

3. A. financially B. financial C. finance

a. The …….. implications of leasing a computer may be less than owning one.

b. Companies often borrow huge sums of money to …… large-scale projects to computerize their business.

c. ……..…. speaking, a microcomputer is more affordable than a minicomputer.

4. A. education B. educational C. educated

a. There are many …… institutes that teach computer programming.

b. It is possible that by the year 2000, a well-…….. person will have to have a good knowledge of computer science.

c. There are many fields of ……..... today that use computers as teaching tools.

5. A. flexible B. flexibility

a. Because of their …… microcomputers are becoming more popular than minicomputers.

b. Microcomputers have a more ……..... set of instructions than microcomputers.

Exercise 3. Choose the one option - a, b, c or d - that best completes the passage.

The World Wide Web is ……(1)…… million of sites ……(2)…….. by anybody from multimedia corporations to ……(3)……. people like you and me. On the web you can read online newspapers or magazines; you can watch videos, ……(4)…… music or buy anything …….(5)……. a CD to a holiday.

You can go into a ……..(6)…….. and ……..(7)..... to other people all over the world or …….(8)……. a newsgroup for more serious debate. If you are really ambitious you might even like to try creating your own ……. (9)……. Then you can …….(10)…… your holiday pictures to the whole world.

1.	a. make up	b. made up of	c. made from	d. made of
2.	a. taken	b. discovered	c. invented	d. created
3.	a. usual	b. normal	c. ordinary	d. typical
4.	a. download	b. listen	c. watch	d. unload
5.	a. like	b. on	c. from	d. with
6.	a. talk room	b. CD-ROM	c. chat room	d. speaking
7.	a. talk	b. speak	c. say	d. converse
8.	a. attend	b. take	c. access	d. join
9.	a. chat room	b. web page	c. pictures	d. internet
10.	a. see	b. send	c. indicate	d. show

Exercise 4. Study these examples of domain name extensions and their meanings. Then match the suggestions for extensions to their meanings.

Extension	Meaning
.biz	-> businesses
.com (.co in UK)	-> commercial
.mil	-> military agency
.info	-> general use
.aero	-> aviation industry

Extension	Meaning
.coop	international organisation
.edu (.ac in UK)	online retail store
.gov	educational and research
.info	non-profit organisation
.int	cooperatives
.museum	informative
.name	individuals
.net	gateway or host
.org	government
.pro	firm or agency
.firm	Web-related
.store	museums
.web	professionals
.arts	cultural or entertainment
. rec	recreational
.nom	personal

Exercise 5. Read the text then match the beginnings and endings to make complete sentences.

All Internet end users want access systems to provide increasingly speeds at a reasonable cost. Many users also want their Internet access to be closely coupled with the means they use to access other services. What are the challenges to measurer against in meeting these needs of Internet users?

As described in this paper, the first challenge - the technology challenge - has been met vigorously by ingenious network providers and equipment vendors who have created a wide variety of high-speed access systems.

The second challenge is cost. New technology is usually costly, and the difficult challenge of meeting cost targets can take longer than access providers and end users wish. Today, the lag from technology creation to economic prove-in is the throttle regulating the pace at which emerging high-speed technologies gain widespread acceptance.

As access providers conquer the first two challenges and become successful in providing low-cost, high-speed access systems, it is already clear that new challenges will arise. For

example, some access systems achieve high peak burst rates by sharing broadband-access media among many users. Eventually, all systems may find it beneficial to use shared links in portions of the access network. Shared systems have different network-engineering considerations from individual circuit-based systems, so we can expect shared systems to spawn new network engineering challenges for dealing with congestion, quality of service (QoS), and other performance criteria.

Finally, there are challenges in meeting the needs of users who see benefits in having Internet access combined with access to other services such as entertainment video and work-at-home intranets. Solutions such as virtual networks are being considered to address these needs, and access in a important enabler of these multiservice, multimedia solutions.

1. The first challenge is...
2. The second challenge is...
3. The final challenge is....
4. All Internet end users want...
5. Many users also want their Internet access...
6. New technology...
7. The difficult challenge of meeting cost targets...
8. Some access systems achieve high peak burst rates...
9. As access providers conquer the first two challenges,...

a. can take longer than access providers and end users wish.
b. to be closely coupled with the means they use to access other services.
c. by sharing broadband-access media among many users.
d. the technology challenge.
e. it is already clear that new challenges will arise.
f. cost.
g. access systems to provide increasingly speeds at a reasonable cost.
h. is usually costly.
i. meeting the needs of users.

Exercise 6. Reading text

A. Complete the text with suitable forms of the given words.

SOFTWARE, INTEGRATION, AND PROCESSES

The CompactPCI backplane acts as a seamless ..... (1. connect) between all peripherals attached to it. The CPU and all other PCI-compatible chips appear as resources common to the entire system, while peripheral chips appear to system software as though they are co-located with chips on the CPU of a standard PC. This situation has several implications.

First, it means that no barrier exists to running software and processes that have evolved in the desktop world on CompactPCI compliant; it can be integrated into a CompactPCI platform. Integrators can simply choose ..... (2. device) from a vast array a wide variety of interfaces can be supported on the same platform, as they simply become resources within the same system and peripherals to the CompactPCI bus.

A further benefit is the fact that a wide range of ..... (3. operate) systems can be supported within a CompactPCI system. Most operating systems that run on a PC will run on CompactPCI systems without further ..... (4. modify). Furthermore, developers can select the processor they require based on preference alone. This wide range of compatibility makes it a ..... (5. relative) straightforward task for developers to build CompactPCI systems or to transfer from one technology to another. It also confers a degree of future proofing to system design. Because all system components are peripherals of the CompactPCI bus, individual components may readily be replaced without causing disruption to the system as a whole.

Given the capabilities of this new technology, it is ..... (6. use) to review the applications to which it can be directed. As previously indicated, PC-based systems built around various kinds of network interfaces (e.g., E1, T1, asynchronous transfer mode [ATM], and IP) are already common. Despite their ever-growing sophistication, reliability, and cost effectiveness, such systems have been positioned somewhere between, trying to reconcile the demands of each community on the one hand for cost-effective functionality and on the other for telco-grade reliability.

There is no doubt that PC ..... (7. solve) have answered many of the arguments against them, but objections will be raised in some quarters. However, CompactPCI changes all of this. It offers the best of both worlds (i.e., the opportunity to develop complex systems in a cost-effective manner while addressing the issues of reliability that are raised against the PC world).

Developers have a tremendous opportunity to offer telco-grade ..... (8. equip) using technologies that have evolved from PCs. Rugged, fault-tolerant, reliable, and high-density ..... (9. apply) can readily be implemented. CompactPCI may be anticipated all areas of the telecommunications network, and as more and more networks are rolled out by more and more ..... (10. operate), cost considerations will surely force purchasers in the direction of systems designed using this new technology.

The first system to offer hot swap as a truly open standard, CompactPCI is indeed revolutionary.

B. Match the two columns to make phrases.

• CompactPCI	• chips
• telecommunications	• components
• system	• interfaces
• transfer	• network
• operate	• mode
• CompactPCI	• systems
• individual	• bus
• network	• backplane
• CompactPCI	• design
• peripheral	• systems

Exercise 7. Read the text then choose the most suitable answer.

INTERNET TELEPHONY

Definition

Internet telephony refers to communications services - voices, facsimile, and/ or voice-messaging applications-that are transported via the Internet, rather than the public switched telephone network (PSTN). The basic steps involved in originating an Internet telephone call are conversion of the analog voice signal to digital format and compression/translation of the signal into Internet protocol (IP) packets for transmission over the Internet; the process is reversed at the receiving end.

1. Introduction

The possibility of voice communications traveling over the Internet, rather than the PSTN, first became a reality in February 1995 when Vocaltec, Inc introduced its Internet Phone software. Designed to run on a 486/ 33-MHz (or higher) personal computer (PC) equipped with a sound card, speakers, microphone, and modem, the software compresses the voice signal and translates it into IP packets for transmission over the Internet. This PC-to-PC Internet telephony works, however, only if both parties are using Internet Phone software.

In the relatively short period of time since the, Internet telephony has advanced rapidly. Many software developers now offer PC telephony software but, more importantly, gateway servers are emerging to act as an interface between the Internet and the PSTN. Equipped with voice-processing cards, these gateway servers enable users to communicate via standard telephones.

A call goes over the local PSTN network to the nearest gateway server, which digitizes the analog voice signal, compresses it into IP packets, and moves it onto the Internet for transport to a gateway at the receiving end. With its support for computer-to-telephone calls, telephone-to-computer calls and telephone-to-telephone calls, Internet telephony represents a significant step-toward the integration of voice and data networks.

Originally regarded as a novelty, Internet telephony is attracting more and more users because it offers tremendous cost savings relative to the PSTN. Users can bypass long-distance carriers and their per-minute usage rates and run their voice traffic over the Internet for a flat monthly Internet-access fee.

2. Intranet Telephony Paves the Way for Internet Telephony

Although progressing rapidly, Internet telephony sill has some problems with reliability and sound quality, due primarily to limitations both in Internet bandwidth and current compression technology. As a result, most corporations looking to reduce their phone bills today confine their Internet-telephony applications to their intranets can support full-duplex, real-time voice communications. Corporations generally limit their Internet voice traffic to half-duplex asynchronous applications (e.g., voice messaging).

Internet telephony within an intranet enables users to save on long-distance bills between sites; they can make point-to-point calls via gateway servers attached to the local-area network (LAN). No PC-based telephony software or Internet account is required.

For example, User A in New York wants to make a (point-to-point) phone call to User B in the company's Geneva office. He picks up the phone and dials an extension to connect with the gateway server, which is equipped with a telephony board and compression-conversion software; the server configures the private branch exchange (PBX) to digitize the upcoming call. User A then dials the number of the London office, and the gateway server transmits the (digitized, IP-packetized) call over the IP-based wide-area network (WAN) to the gateway at the Geneva end. The Geneva gateway converts the digital signal back to analog format and delivers it to the called party.

This version of Internet telephony also enables companies to transmit their (digitized) voice and data traffic together over the intranet in support of shared applications and white boarding.

3. Technical Barriers

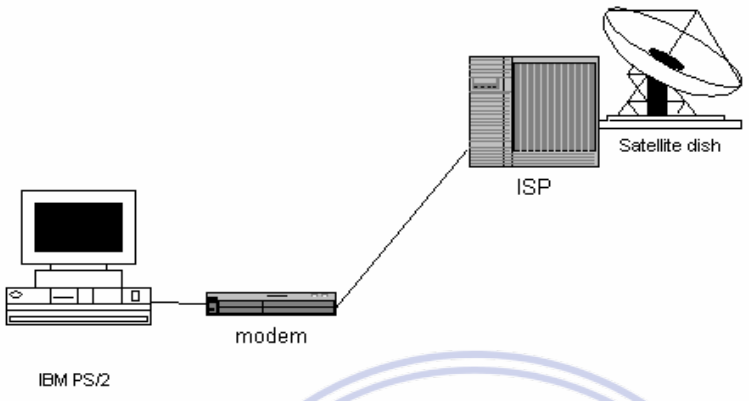
The ultimate objective of Internet telephony is, of course, reliable, high-quality voice service, the kind that users expect from the PSTN, At the moment, however, that level of reliability and sound quality is not available the Internet, primarily because of bandwidth limitations that lead to packet loss. In voice communications, packet loss shows up in the form of gaps or periods of silence in the conversation, leading to a clipped-speech effect that is unsatisfactory for most users and unacceptable in business communications.

The Internet, a collection of more than 130,000 networks, is gaining in popularity as millions of new users sign on every month. The increasingly heavy use of the Internet's limited bandwidth often results in congestion which, in turn, can cause delays in packet transmission. Such network delays mean packets are lost or discarded.

In addition, because the Internet is a packet-switched or connectionless network, the individual packets of each voice signal travel over separate network paths for reassembly in the proper sequence at their ultimate destination. While this makes for a more efficient use of network resources than the circuit-switched PSTN, which routes a call over a single path, it also increases the chances for packet loss.

Network reliability and sound quality also are functions of the voice-encoding techniques and associated voice-processing functions of the gateway servers. To date, most developers of

Internet-telephony software, as well as vendors of gateway servers, have been using a variety of speech-compression protocols. The use of various speech - coding algorithms - with their different bit rates and mechanisms for reconstructing voice packets and handling delays-produces varying levels of intelligibility and fidelity in sound transmitted over the Internet. The lack of standardized protocols also means that many Internet-telephony products do not interoperate with each other or with the PSTN.



4. Standards

Over the next few years, the industry will address the bandwidth limitations by upgrading the Internet backbone to asynchronous transfer mode (ATM), the switching fabric designed to handle voice, data, and video traffic. Such network optimization will go a long way toward eliminating network congestion and the associated packet loss. The Internet industry also is tackling the gradual adoption of standards. Standards-setting efforts are focusing on the three central elements of Internet telephony: the audio codec format; transport protocols; and directory services.

In May 1996, the International Telecommunications Union (ITU) ratified the H.323 specification, which defines how voice, data, and video traffic will be transported over IP-based local area networks; it also incorporates the T. 120 data-conferencing standard. The recommendation is based on the real-time protocol/ real-time control protocol (RTP/ RTCP) for managing audio and video signals.

As such, H.323 addresses the core Internet-telephony applications by defining how delay-sensitive traffic, (i.e., voice and video), gets priority transport to ensure real-time communications service over the Internet. (The H.324 specification defines the transport of voice, data, and video over regular telephony networks, while H.320 defines the protocols for transporting voice, data, and video over integrated services digital network (ISDN). H.323 is a set of recommendations, one of which is G.729 for audio codecs, which the ITU ratified in November 1995. Despite the ITU recommendation, however, the Voice over IP (VoIP) Forum in March 1997 voted to recommend the G. 723.1 specification over the G. 729 standard. The industry consortium, which is led by Intel and Microsoft, agreed to sacrifice some sound quality for the sake of greater bandwidth efficiency-G.723.1 requires 6.3 kbps, while G.729 requires 7.9 kbps. Adoption of the audio codec standard, while an important step, is expected to improve reliability and sound quality mostly for intranet traffic and point-to-point IP connections. To achieve PSTN-like quality, standards are required to guarantee Internet connections.

The transport protocol RTP, on which the H.323 recommendation is based, essentially is a new protocol layer for real-time applications; RTP-compliant equipment will include control mechanisms for synchronizing different traffic streams. However, RTP does not have any mechanisms for ensuring the on-time delivery of traffic signals or for recovering lost packets. RTP also does not address the so-called quality of service (QoS) issue related to guaranteed bandwidth availability for specific applications. Currently, there is a draft signaling-protocol standard aimed at strengthening the Internet's ability to handle real-time traffic like the circuit-switched PSTN does). If adopted, the resource reservation protocol (RSVP), will be implemented in routers to establish and maintain requested transmission paths and quality-of-service levels.

Finally, there is a need for industry standards in the area of Internet-telephony directory services. Directories are required to ensure interoperability between the Internet and the PSTN, and most current Internet-telephony applications involve proprietary implementations. However, the lightweight directory access protocol (LDAP v 3.0) seems to be emerging as the basis for a new standard.

5. Future of VoIP Telephony

Several factors will influence future developments in VoIP products and services. Currently, the most promising areas for VoIP are corporate intranet and commercial extranets. Their IP-based infrastructures enables enable operators to control who can-and cannot-use the network.

Another influential element in the ongoing Internet-telephony evolution is the VoIP gateway. As these gateways evolve from PC-based platforms to robust embedded systems, each will be able to handle hundreds of simultaneous calls. Consequently, corporations will deploy large numbers of them in an effort to reduce the expenses associated with high-volume voice, fax and videoconferencing traffic. The economics of placing all traffic-data, voice, and vide-over an IP-based network will pull companies in this direction, simply because IP will act as a unifying agent, regardless of the underlying architecture (i.e., leased lines, frame relay, or ATM) of an organization's network.

This version of internet telephony also enables companies to transmit their (digitized) voice and data traffic together over the intranet in support of shared applications and white boarding.

6. Technical Barriers

The ultimate objective of Internet telephony is, of course, reliable, high-quality voice service, the kind that users aspect from the PSTN. At the moment, however, that level of reliability and sound quality is not available on the Internet, [primarily because of bandwidth limitations that lead to packet loss. In voice communications, packet loss shows up in the form of gaps or periods of silence in the conversation, leading to a clipped-speech effect that is unsatisfactory for most users and unacceptable in business communications.

Questions:

1. The first Internet-telephony soft-ware, Internet Phone, supported PC-to-PC and telephone-to-telephone voice calls via the Internet.

a. true b. false

2. The current reliability and sound-quality problems of Internet telephony are attributed to limitations in Internet bandwidth and compression technology.

a. true b. false

3. As a packet-switched or connectionless network, the Internet decreases the chances of packet loss for a voice call.

a. true b. false

4. To date, most developers of Internet-telephony software and vendors of gateway servers have used the same speech-compression protocols.

a. true b. false

5. The ITU has ratified a standard for voice, data and video transmission over IP-based local area networks.

a. true b. false

6. ITU's H.320 standard defines the protocols for transporting voice, data and video over:

a. PSTN b. ISDN networks c. the public Internet

7. The G.723.1 specification for audio codecs, recommended by the VoIP Forum, requires:

a. 6.3 kbps b. 7.9 kbps c. 8.4 kbps

8. Internet-telephony directories enable:

a. users to determine other users' Internet addresses

b. users to determine whether an Internet site is capable of receiving Internet-telephony transmissions

c. Internet/ PSTN Interoperability

9. In the near term, the market segment expected to be the biggest driver for VoIP telephony is:

a. small-office/ home-office (SOHO) customers

b. military/ government networks

c. corporate intranets/ extranets

10. The public Internet will be able to transport voice calls reliability and with high quality when:

a. standards are established for Internet directories

b. manufacturers produce higher-quality, lower-cost audiocodec technology

c. various technologies deliver backbone-network and subscriber-access speeds

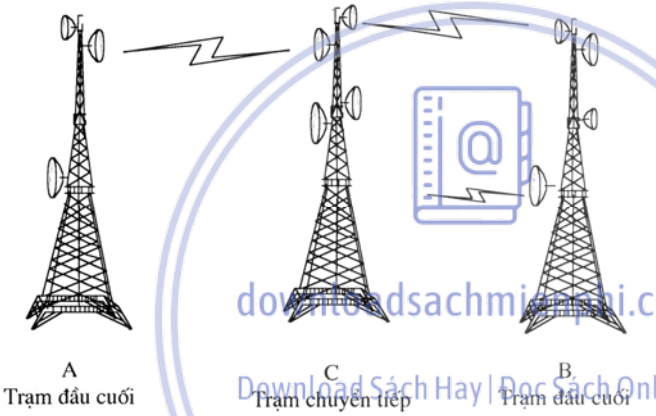
UNIT 9

Exercise 1. Read the following text carefully.

RADIO SYSTEMS

Radio link are used almost exclusively for transmission between exchanges. The techniques are based on directed radio waves which are sent between antennae. Frequencies between 300 MHz and 20 GHz are used in the telephone network. The hop length (distance between the antennae) depends to some extent on the radio frequency used.

At higher frequencies the distance may be 15 - 20 km, and of the order of 50 - 60 km at lower frequencies. There are radio link systems for both analogue and digital transmission. In analogue system, up to 2700 FDM channels can be transmitted simultaneously, while digital links have a capacity of up to 2840 channels.



A. Match the right with one on the left.

1. worldwide	a. exclusively
2. approximately, about	b. of the order of
3. not as many as	c. simultaneously
4. at the same time	d. global
5. only	e. fewer than

B. Find a word which means the opposite of the following words and expressions. Some of them are found in the text.

1. lower.....	6. small.....
2. international.....	7. dearer.....
3. near.....	8. prevent.....
4. stationary.....	9. take-off.....
5. danger.....	10. heaven.....

Exercise 2. Fill in each blank with ONE suitable preposition.

1. The home MTX hands ……..…… the call ……..…... the MTX controlling the visited traffic area.

2. They answered a few questions …… the future of satellites.
3. A satellite receives, amplifies and redirects the information we send …….. to it.
4. In 2050, most calls will be transmitted …… satellite.
5. They are subjected …….. familiar faults such as crossed lines, noise and wrong numbers.
6. The most important type ……. satellite ……..…….. telecommunications is the geosynchronous, or geostationary, satellite.
7. Satellites act …….. a kind of reflector ……. the sky.
8. How many exchanges does each traffic area consist ……?
9. What is the influence …….. direct broadcasting satellites and readily available home earth stations?
10. In my opinion, space shuttles are very important ……..…… satellite communications.

Exercise 3. Fill in each blank with ONE suitable given word.

computer	*channels*	*based*	*use*	*end-user*
satellites	*antenna*	*system*	*receiver*	*digital*

SATELLITE BROADCAST

Several approaches have been proposed for using (1)..... to provide Internet-access downlinks. Some proposals are (2)……..on using a single fixed-position satellite, whereas others would use clusters of satellites. Proposed data rates vary from low-speed, single-user (3)..... to shared channels with rates greater than one Mbps.

The first widely available (4)..... operates in the 12 GHz band and uses a data rate of 400 kbps. Equipment at the (5)..... location consists of a dish (6)....., approximately 52 centimetres in diameter, a microwave (7)....., and a (8)..... decoder card that plugs directly into a PC (9)..... bus. Satellite systems (10)..... also telephony circuits for uplink access.

Exercise 4. Read the passage then answer the questions.

Remember, not so long ago, when the telephone used to be a simple receiver connected by a wire to the wall. And all you used your phone for was to make a phone call. Today, new technology has changed the telephone and what people use it for.

Computer-based technology has given us instant connections and clearer conversations over the telephone. Nowadays, people use telephone to do their banking, to rent videos, and to buy things. People use their telephone to connect their home computers to computerized information centers. People also send letters and documents through phone by fax. And new systems may be available shortly for sending video pictures over the telephone.

But you don't need to be at home or at the office to use the telephone anymore. Mobile phones (also known as cellular phones) have no wires. You can carry one in your pocket or keep one in your car. A call from a mobile phones travels along radio waves to stations located in different places. From there, the radio signal is connected to the regular phone system. With a

mobile phone, anyone who can drive and talk can also drive and phone. This means less wasted time. You don't have to look for a phone booth or use coins to make a call. So remember, next time you are at the beach or riding your bicycle, there might be a call for you!

Questions:

1. How have computers improved telephone services?

.....

2. What are the uses of the telephone that you can find in the passage?

.....

3. Are there systems for sending video pictures over the telephone?

.....

4. How does a mobile phone call reach a station?

.....

5. What are the advantages of having a mobile phone?

.....

Exercise 5. Match the two columns.

1. EMF	a. Signalling System No.7
2. GSM	b. Public Telephone Operator
3. HDTV	c. International Telecommunication Union
4. IF	d. ITU - Regulated
5. ITU	e. High Density TV
6. ITU-R	f. Loss of signal
7. LEO	g. Voice frequency
8. LOS	h. Intermediate frequency
9. MCA	i. extremely high frequency
10. pls	j. Phase Modulation
11. PM	k. Multi-channel Access
12. PTO	l. Low earth orbit satellite
13. SS7	m. please
14. VF	n. Global System for Mobile Communication

Exercise 6. Read the text then match the two columns.

RADIO LINK

In radio link connections, transmission is effected via a chain of radio transmitters and radio receivers. The radio links is used for analogue as well as for digital transmission. At regular intervals, the signal is received and forwarded to the next link station. The link station may be either active or passive. An active link station amplifies or regenerates the signal. A passive link station generally consists of two directly interconnected parabolic antennas without any amplifying electronics between them.

Each radio link needs two radio channels: one for each direction. A few MHz spacing is needed between the transmitter frequency and the receiver frequency. The same parabolic antenna and waveguide are used for both directions.

The distance between the link stations - also called the hop length - is depending on output power, antenna type and climate, as well as on the frequency. The higher the carrier frequency, the shorter the range is. For example, a 2 GHz system has a range of approximately 50 kilometres, and an 18 GHz system has a range of 5 - 10 km.

• A 2 GHz system • The passive link station • The active link station • The distance between the link stations • The hop length • The link station • An 18 GHz system • Each radio link	• amplifies or regenerates the signal. • depends on output power, antenna type, climate and on the frequency. • generally consists of two directly interconnected parabolic antennas without any amplifying electronics between them. • has a range of approximately 50 kilometres. • may be either active or passive. • is called the hop length. • needs two radio channels. • has a range of 5 - 10 km.

Exercise 7. Read the text then decide whether the sentences are true or false. Correct the false ones.

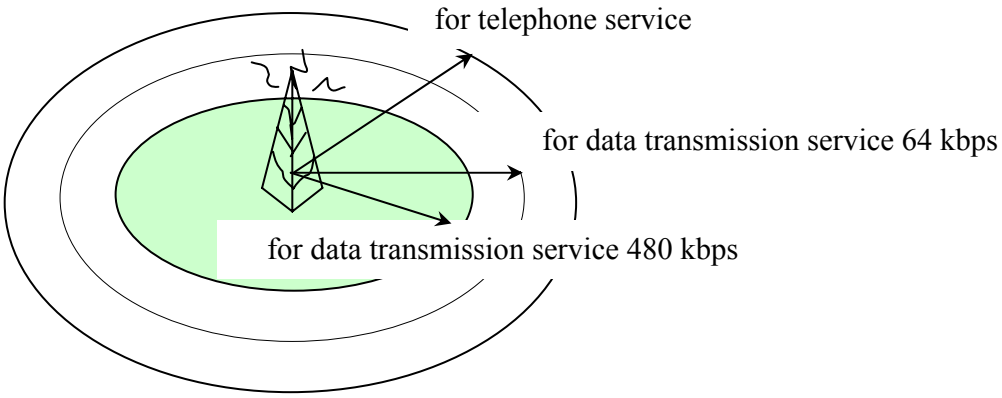
Radio is a transmission medium with a large field of applications, and a medium that provides the users with great flexibility (for example cordless telephones). Radio can be used locally, intercontinentally, and for fixed as well as mobile communication between network nodes or between users and network nodes.

The radio spectrum, from 3 KHZ to 300 GHz, is one range of the electromagnetic spectrum (infrared, visible and ultraviolet light, and X-ray frequencies are other ranges). The radio spectrum is divided into eight frequency bands, from VLF (very low frequency) to EHF (extremely high frequency).

The propagation of a radio wave depends on its frequency. Radio waves with frequencies below 30 MHz are reflected against different layers of the atmosphere and against the ground, allowing them to be used for maritime radio, telegraphy and telex traffic. The capacity is limited to some hundreds of bit/s.

Above 30 MHz, the frequencies are too high to be reflected by the ionised layers in the atmosphere. The VHF and UHF frequency bands, which are used for RTV, broadcasting and mobile telephone; belong to this group. Frequencies above 3 GHz suffer severe attenuation caused by objects (such as buildings) and therefore require a free “line if sight” between the transmitter

and the receiver. Radio link systems use frequencies between 2 and 14 GHz. The capacity is in the magnitude of 10-150 Mbit/s.



For different services

1. Radio is a transmission medium with a large field of applications.
2. Radio can be used locally only.
3. Radio can be used for fixed as well as mobile communication between network nodes or between users and network nodes.
4. Infrared, visible and ultraviolet light, and X-ray frequencies are from 3 KHZ to 300 GHz.
5. The propagation of a radio wave depends on its frequency.
6. The radio spectrum is divided into seven frequency bands, form VLF (very low frequency) to VHF (very high frequency).
7. The VHF and UHF frequency bands are used for RTV, broadcasting, and mobile telephone.
8. Radio link systems use frequencies between 4 and 14 GHz.

UNIT 10

Exercise 1. Read the following text carefully.

Wireless

The first commercially available radio and telephone system, known as improved mobile telephone service (IMTS) was put into service in 1946. This system was quite unsophisticated - but then there was no solid state electronics available.

With IMTS a tall transmitter tower was erected near the center of a metropolitan area. Several assigned channels were transmitted and received from the antenna atop this tower. Any vehicle within range could attempt to seize one of those channels and complete a call. Unfortunately, the number of channels made available did not come even close to satisfying the need. To make matters worse, as the metropolitan area grew, more power was applied to the transmitter or receiver, the reach was made greater, and still more erstwhile subscribers were unable to get dial tone.

The solution to this problem was cellular radio. Metropolitan areas were divided into cells of no more than a few miles in diameter, each cell operating on a set of frequencies (send and receive) that differed from the frequencies of the adjacent cells. Because the power of the transmitted in a particular cell was kept at a level just high enough to serve that cell, these same sets of frequencies could be used at several places within the metropolitan area. Beginning in 1983, two companies, one called a wireline company and the other called a nonwireline carrier, were given a franchise to operate in each major territory.

Two characteristics of cellular systems were important to their usefulness. First, the systems controlled handoff. As subscribers drove out of one cell and into another, their automobile radios, in conjunction with sophisticated electronic equipment at the cell sites (also known as base stations) and the telephone switching offices (also known as mobile telephone switching office [MTSO]), transferred from one frequency set to another with no audible pause. Second, systems were also designed to locate particular subscribers by paging them in each of the cells. When the vehicle in which a paged subscriber was riding was located, the equipment assigned sets of frequencies to it, and conversation could begin.

The initial transmission technology used between the vehicle and the cell site was analog in nature. It is known as advanced mobile phone service (AMPS). The analog scheme used was called frequency division multiple access (FDMA). But the age of digital transmission was upon us, and many companies operating in this area concluded that a digital transmission scheme would be preferred. The result was time division multiple access (TDMA). In Europe, the selected scheme was an adaptation of the TDMA used in the United States, and it was called group special mobile. Since then the name has been changed to global system for mobile communications (GSM).

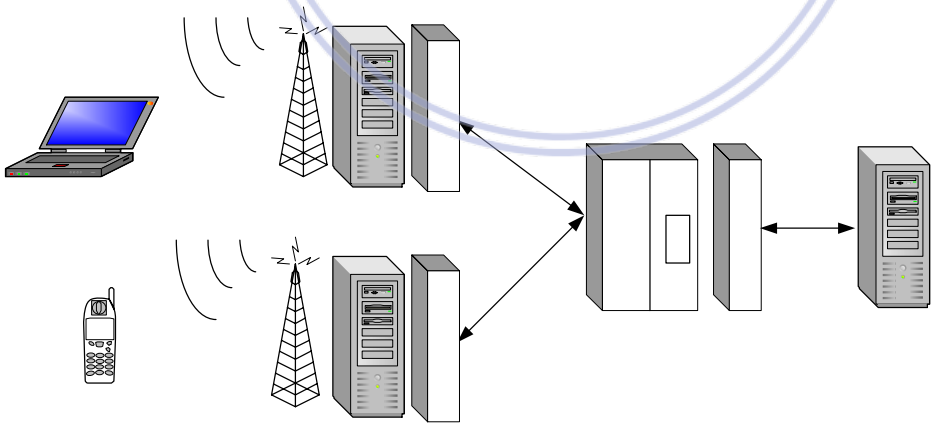
As if that was not enough, a third group of companies determined that a special spread-spectrum or frequency-hopping scheme would be even better, and this also was developed and trialed. This is called code division multiple access (CDMA). Thus there are at least four schemes that may be used for communications between a vehicle and the cell site. Communications

between the cell site and the MTSO utilized more conventional techniques, such as microwave, copper pairs, or fiber optics.

Geosynchronous satellites represent yet another way of providing wireless communications. These satellites, located 22,300 miles above the earth, revolve around the earth once each twenty-four hours-the same as the earth itself. Consequently they appear to be stationary. Communications between two places on earth can take place by using these satellites; one frequency band is used for the uplink, and another for the downlink. Such satellite systems are excellent for the transmission of data, but they leave something to be desired for voice communications. This is a result of the vast distance and the time it takes for an electrical signal to make an earth-satellite-earth round trip. That time amounts to one quarter of a second. A reply from the called subscriber takes another quarter of a second, and the resultant half a second is definitely noticeable. Consequently, voice communications is seldom carried via geosynchronous satellites.

Yet another wireless telecommunications technology is the low earth orbit (LEO) satellite system. LEOs are satellites that communicate directly with handheld telephones on earth. Because these satellites are relatively low - less than 900 miles - they move across the sky quite rapidly. In a LEO system the communications equipment on a satellite acts much like the cell site of a cellular system. It catches the call from earth and usually passes it to an earth-based switching system. Because of the speed of the satellite, it is frequency necessary to hand off a particular call to a second satellite just rising over the horizon. This is akin to a cellular system, except that in this case it is the cell site that is moving rather than the subscriber.

Several systems are now in the planning stage, and in fact many satellites have already been launched. The most noted is Iridium, created by Motorola, which would utilize sixty-six satellites. A second system, called Globalstar, would employ forty-eight satellites. There are at least two or three others that are well advanced in terms of preparations to launch.



A. Give the full forms of the abbreviations.

LEO: ……

CDMA: ……

GSM: ……

AMPS: ……

FDMA: ……

IMTS: ……

TDMA: ……

B. Answer the questions.

1. When was improved mobile telephone service put into service?
   a. In 1946 b. In 1945
2. Where was the transmitter tower erected?
   a. Any vehicle within range
   b. Near the center of a metropolitan area
3. How many characteristics of cellular systems were there?
   a. There were two. b. There were three.
4. What was the first characteristic of cellular systems?
   a. The systems controlled handoff.
   b. The systems were designed to locate particular subscribers by paging them in each of the cells.
5. How many schemes are there at least that may be used for communications between a vehicle and the cell site?
   a. There are four. b. There are five.
6. What techniques did communications between the cell site and the MTSO utilize?
   a. voice communications
   b. more conventional techniques, such as microwave, copper pairs, or fiber optics.
7. What does the communications equipment on a satellite act much like in a LEO system?
   a. The cell site of a cellular system
   b. an earth-based switching system
8. How many satellites would Iridium utilize?
   a. forty-eight satellites b. sixty-six satellites.

C. Match the two columns to make suitable phrases.

• metropolitan	• site
• telecommunications	• satellites
• satellite	• technology
• geosynchronous	• tone
• frequency	• technology
• voice	• system

• cell • copper • transmission • digital • dial • electronic	• area • equipment • transmission • communications • pairs • band

Exercise 2. Fill in the blanks with suitable prepositions.

The continuing growth (1)……..….. cellular communications (there are presently about 20000 new subscribers signing (2)……..……. each day), led the government and industry (3)..…….....…… the United States to search for additional ways to satisfy the obvious need not only for ordinary telephone service but also (4) ….....….. special services and features, smaller telephones, and cellular phone use.

This search led (5) …...…..…. the PCS industry. Additional frequency bands were allocated for their use, and rather than assigned them (6)…....…… the first comers by way of a lottery, the FCC auctioned them off through a sophisticated bidding contest that brought the U.S. treasury billions (7) ……...…… dollars.

1. a. to	b. on	c. of
2. a. on	b. to	c. in
3. a. at	b. in	c. from
4. a. at	b. to	c. for
5. a. to	b. for	c. on
6. a. to	b. for	c. on
7. a. to	b. on	c. of

Exercise 3. Reading text.

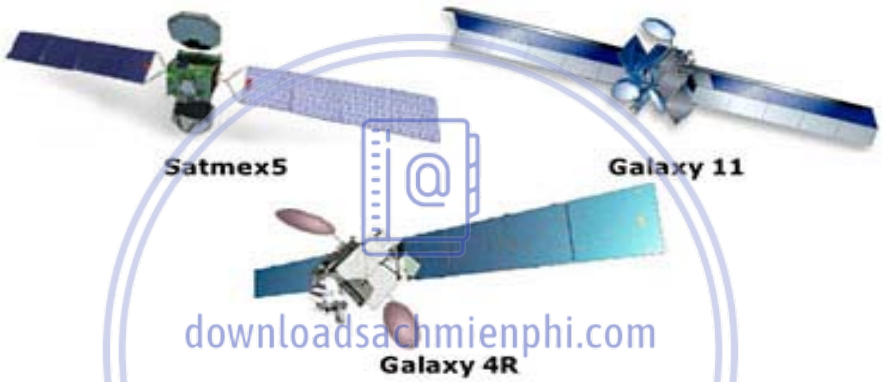
[1] Satellites used for telecommunications are placed in geostationary orbits in the equatorial plane 35,800 km above the earths' surface. **They** have an orbiting time of 24 hours **which**, because of the earth's rotation, gives **them** the appearance of being stationary. Approximately one third of the earth's surface is covered by an

[5] antenna with global radiation. Satellite links are used in national as well as

international telecommunications networks. Intercontinental use has decreased in favour of optical submarine cables.

The transmission properties of satellite links are excellent and problems are few. However, the long distance between terrestrial stations via the satellite does cause a 240 ms delay, **which** in itself is troublesome to voice communication and
[10] which may have echoes with a propagation time of about 0.5 seconds.

Intelsat (International Telecommunications Satellite Organization) was founded with the aim of financing, developing and running worldwide commercial telecommunication satellite systems. Today, Intelsat, **who** is responsible for the launching and operation of satellites, has in excess of 100 operators as stakeholders. The individual operators (or an association of operators) manage the terrestrial
[15] stations. Intelsat, however, is responsible for the few stations **that** are required to control and supervise the satellites. One of Intelsat's satellites is Intelsat IV, **which** has 80,000 voice channels.



A. Fill in the blanks with suitable numbers.

1. Satellites used for telecommunications have an orbiting time of ..... hours 2. One of Intelsat's satellites is Intelsat ....., which has .....voice channels. 3. Satellites used for telecommunications are placed in geostationary orbits in the equatorial plane ..... km above the earths' surface. 4. The delay may have echoes with a propagation time of about ..... seconds. 5. Today Intelsat has in excess of ..... operators as stakeholders.	a. IV b. 0.5 c. 24 d. 80,000 e. 100 f. 35,800

B. Find out what the words in BOLD typeface refer to.

1. **They** (line 2):	.....
2. **which** (line 3):	.....
3. **them** (line 3):	.....

4. **which** (line 10):	.....
5. **who** (line 14):	.....
6. **that** (line 17):	.....
7. **which** (line 18):	.....

C. Decide whether the sentences are true or false. Correct the false ones.

1. **Approximately one fourth of the earth's surface is covered by an antenna with global radiation.**
2. Intercontinental use of satellites has decreased in favour of coaxial cables.
3. The transmission properties of satellite links are excellent and problems are few.
4. Satellite links are used only in international telecommunications networks.
5. The long distance between terrestrial stations via the satellite causes a 140 ms delay.
6. Intelsat was founded with the aim of financing, developing and running worldwide commercial telecommunication satellite systems
7. Intelsat is responsible for the launching and operation of satellites.
8. One of Intelsat's satellites is Intelsat V which has 80,000 voice channels.

Exercise 4. Match the stems and affixes with their definitions.

1. microbe	a. an instrument used to make soft sounds louder.
2. phonology	b. not able to be seen.
3. audience	c. a group of listeners.
4. chronicler	d. the study of speech sounds.
5. chronology	e. not normal.
6. irregular	f. a person who records events in the order of their occurrence.
7. microphone	g. a living organism too small to be seen with the naked eye.
8. invisible	h. a list of events in order of their occurrence.

KEY

UNIT 1

Exercise 1. Read the following passage then answer the questions.

A. 1. T 2. F 3. F 4. F 5. T
6. F 7. T 8. F 9. T 10. T

B. 1. recreate 2. regenerate 3. reconvert
4. reorganize 5. reteach

C. 1. unaffected 2. unimportant 3. unaffected 4. impossible
5. unsuitable 6. inaudible 7. unimportant 8. impossible

D.

information	interpretation	distortion	recreation
transmission	amplification	recognization	
accumulation	regeneration	combination	communication

Exercise 2. Complete the sentences, using suggested words.

1. Transmission	2. racing	3. arranged	4. are
5. take	6. complicated	7. scarcity	8. better

Exercise 3. A. Fill in the blanks with suitable noun form of the given words.

1. resistance	2. expansion	3. disconnection	4. destruction
5. height	6. failure	7. discoloration	8. deterioration
9. damage	10. induction		

B. Translate it into Vietnamese.

VÍ DỤ VỀ CÁC TÁC ĐỘNG CỦA NGOẠI LỰC THIÊN NHIÊN/ NHÂN TẠO

- Tác động của môi trường thiên nhiên

  * Nhiệt độ: Do đóng băng: Điện trở đất tăng lên
    Các cột bị lung lay
    Cáp bên trong ống dẫn bị vỡ do nén
  * Do thay đổi nhiệt độ: Rạn nứt, dãn nở / co rút
  * Gió(sương muối...): Sụt lở, rạn nứt do dao động, đứt, ăn mòn
  * Mưa, nước (nền đất rò rỉ...): úng ngập, ăn mòn.
  * Tuyết: Bị đứt và bị phá hủy do tuyết
    Đường cáp không đủ tầm cao do tuyết rơi
  * Độ ẩm: Ăn mòn, lớp cách điện bị hỏng; Làm hư hỏng vỏ cáp, ruột cáp bị ăn mòn
  * Bão cát: Bị phá hủy
  * Động đất: Đứt, sụt, sập do lún đất
  * Địa chất / Địa lý
  * Nắng: Đổi màu, làm xấu chất lượng
  * Chuột, chim, côn trùng: Gây hư hỏng

- Tác động của môi trường nhân tạo

* Dây điện lực: Cảm ứng
* Đường ray điện 1 chiều: Ăn mòn điện phân
* Đường ray điện xoay chiều: Cảm ứng
* Đường dây phân tải điện: Cảm ứng
* Khói nhà máy...: Ăn mòn
* Xe ô tô (rung động, khói): Rạn nứt, gẫy, ăn mòn
* Các việc tương tự khác: Đứt, hủy hoại

Exercise 4. A. Complete the sentences with NOT MORE THAN FIVE WORDS for each blank.

1. set-up site	2. subscriber lines	3. distributed ... feeder
4. (fairly short) junction lines	... (medium- /long-distance) toll lines	
5. indoor and outdoor	6. submarine	7. telephone offices
8. outside plant components	9. communication cables	10. supports
11. metal conductors	12. otical fiber	

B. Match the two columns to make suitable phrases.

telephone offices	feeder cable	subscriber lines
set-up site	outside plants	coaxial cable
metal conductors	glass fiber	transmission media
cable attachments	toll lines	junction boxes
underground structures		

Exercise 5. A. Match the two columns to make suitable phrases.

1. c	2. c	3. a	4. a	5. c
6. e	7. d.	8. e	9. b	

B. What are the words?

1. CABLE	2. TELEPHONE .	3. SECONDARY
4. DISTRIBUTION	5. EQUIPMENT	6. INTERFERENCE

C. Make sentences using the verbs given. (*Suggestive answers)*

1. The phone call goes from the subscriber to the exchange.
2. The cables join at a cross connection point.
3. The two-pair wires come to the distribution point to form a ten-pair cable.
4. It needs a lot of work to lay a cable.
5. Maintaining the cables in the telephone network is not easy at all.

UNIT 2

Exercise 1. Reading text

A. Match the two columns

1. d	2. c	3. f
4. e	5. b	6. a

B. Decide what kind of network is mentioned, using suggested words.

1. Internet 2. SONET 3. WAN 4. LAN 5. SONET
6. LAN 7. The intelligent network 8. SS7 9. original PSTN

Exercise 2. A. Match the beginnings and endings to make complete sentences.

1. f 2. b 3. a 4. c 5. d 6. g 7. e

B. Give the full form of the abbreviations.

- LMS: loop management system
- DSL: digital subscriber line
- VoDSL: voice over DSL
- SDSL: symmetrical DSL
- ADSL: asymmetric digital subscriber line
- CPE: customer premises equipment
- POTS: plain old telephone service
- DSLAM: digital subscriber line access multiplexer

Exercise 3. Classify these objectives under the headings "Technical Objectives", "Commercial Objectives" and "Industrial Objectives".

Technical: 1, 3 ,6, 9 and 11 Commercial: 2, 4, 7 and 10 Industrial: 5 and 8

Exercise 4. A. Write True (T) or False (F) for each sentence. If false, say what is true.

1. T 2. T
3. F. Most people are already familiar with PABX and know how to use all its facilities.
4. F. Installing a LAN is certainly very expensive but it offers a great variety of advantages over a PABX.
5. T. 6. T.
7. F. The principal argument in favour of LANs is their ability to handle large amounts of data at high speed.
8. F. Suppliers of LANs have been offering systems based on two major classes of architecture, the ring and bus topologies.
9. T 10. T

B. Answer the following questions.

1. Ring and bus.
2. Replacing old electromechanical PABXs with modern electronic ones.
3. Familiarity of most users with a PABX; can be easily upgraded through software modifications; full access to all national telecommunication services; single wire connectivity; customers prefer tried and tested systems.
4. High-speed data transfer; less cabling required; offers distributed control, making the LAN more powerful and flexible than a PABX; easier to share specialized resources with a LAN; terminals can be connected more economically; frees PABX for other functions.
5. Central processing unit; office automation; distributed data processing.

UNIT 3

Exercise 1. Complete the sentences, basing on the text.

1. high frequencies.
2. low frequencies.
3. contains a high-amplitude signal
4. contains a low-amplitude signal.
5. a stream of 1s and 0s.
6. 8.000 times per second.
7. analog in nature.
8. time division multiplexing (TDM).
9. a 7 - bit byte.
10. tier 1.

Exercise 2. Fill in the blanks with suitable words.

1. digital	2. network	3. data	4. Internet
5. signal	6. voice	7. packet	8. switching

Exercise 3. Read the sentences about ATM carefully then give the full form of the verbs in brackets.

1. is	2. is formatted	3. guarantees
4. would be	5. be multiplexed ; send	6. enables

Exercise 4. Read the following text carefully.

A. Answer the questions.

1. 2: Paired cables and coaxial cables.
2. Yes.
3. Mainly between subscribers and the exchange, but also may be used between exchanges in the network.
4. One conductor in the centre, surrounded by an tube-like conductor.
5. Paired cable: mainly between subscribers and the exchanges, may also be used between exchanges in the network.

   Coaxial cables: higher bandwidth, mainly between exchanges.
6. Frequency Division Multiplex; Time Division Multiplex.

B. Rearrange the letters to make correct words.

COAXIAL	EXCHANGE	CHANNEL
DIRECTION	CONDUCTOR	NETWORK

UNIT 4

Exercise 1. A. Find out the mistakes in the sentences and correct them, basing on the text.

1. hundred -> million
2. speed -> frequency
3. prevents -> permits
4. minute -> second
5. less -> more
6. fiber-to-the-curb -> fiber-to-the-home
7. fiber-to-the-home -> fiber-to-the-curb
8. not used any more -> now being used
9. in any cases -> when it is economical to do so

B. Give the full form of the words.

FTTN: fiber-to-the-neighborhood	FTTH: fiber-to-the-home
FTTC: fiber-to-the-curb	Gbps: gigabit per second

Exercise 2. Read the following text about SONET then fill in the sentences with the appropriate form.

1. optical 2. worldwide 3. different
4. multiplexing; transmission 5. strung 6. designed; immediately

Exercise 3. Read the following text about optical fibres then fill in the blanks with the most suitable word from the box.

1. messages	2. light	3.optical	4. smaller
5. easier	6. less	7. metal	8. repeaters
9. bandwidth	10.voice	11. robots	

Exercise 4. Match the two columns to make complete sentences.

1. b 2. a 3. c
4. f 5. d 6. e

Exercise 5. Read the text then answer the questions.

1. The reduction of signal strenth or light power over the lenth of the light-carrying medium.
2. In decibels per kilometer (dB/ km).
3. Because it combines high bandwidth with low attenuation.
4. The signals are allowed to be transmitted over longer distances while using fewer regenerators (amplifiers), reducing cost, and improving reliability.
5. The smearing or broadening of an optical signal that results from the many discrete wavelength components traveling at different rates.
6. It limits the maximum data rate or information-carrying capacity of a single-mode fiber link.
7. It can cause a waveform to become significantly distorted.

Exercise 6. Fill in the blanks with suitable form of the suggested words.

1. based	2. carry	3. enables	4. digitalized
5. is	6. provided	7. understood	8. improved

Exercise 7. A. Classify the following nouns as either COUNTABLE (C) or UNCOUNTABLE (U).

1. C	2. C	3. U	4. U	5. C	6. C
7. U	8. U	9. U	10. U	11. U	12. U

B. Complete these sentences, using "much more" or "much less".

1. much more	2. much more	3. much less	
4. much less	5. much more	6. much less	
7. much less	8. much more	9. much less	10. much more

Exercise 8. A. Read the text then match the two columns to make phrases.

manufacturing process	fiber alignment
fiber curl	fiber design
core/ clad concentricity	fiber core

cladding diameter	drawing rate
outer diameter	geometry parameters

B. Decide whether these statements are true or false. If false, say what is true.

1. F. Cladding diameter - the outside diameter of the cladding glass region.
2. T
3. F. Fiber curl - the amount of curvature over a fixed length of fiber.
4. T
5. F. Cladding diameter tolerances control the outer diameter of the fiber.
6. T 7. T
8. F Cladding diameter tolerances are controlled by the drawing rate.
9. T 10.

Exercise 9. Reading text

A. Fill in each blank with ONE suitable given word.

1. manufactured	2. installed	3. expectancy	4. tests	5. issues
6. fiber	7. loss	8. safely	9. inches	10. designed

B. Match the two columns to make phrases.

test results	light weight	small size
fiber breakage	environmental issues	splice trays
handling equipment	fiber-installation errors	service life

UNIT 5

Exercise 1. Fill in the blanks with suitable words from the box.

1. digital	2. modem	3. coding
4. rates	5. signals	6. applications
7. Internet	8. low	9. using
10. technology		

Exercise 2. The events the figures refer to.

1. On July 9, 1877, the Bell Telephone Company was formed.
2. Alexander Graham Bell became the company's electrician, at a salary of $3,000.
3. Alexander Graham Bell said the first recognizable over the so-called "telephone" and an industry was born.
4. Bell's basic patents were due to run out in 1893 and 1894.
5. By the turn of the century there were approximately 6,000 independent telephone operating companies in the country
6. At 5. Exeter Place, Boston, Massachusetts, telephone was invented.
7. AT&T became the official name of the company at the end of 1899.
8. There are approximately 1,300 local exchange carriers at the present times
9. 6,000 telephone operating companies provided service to some 600,000 subscribers.

Exercise 3. A. Answer the questions.

1. The telecommunications is considered one of the most important infrastructure industries of the national economy and also an effective measure for the leadership of the Party and State.
2. There are four. The third and the fourth ones are:

   By the year 2010, the telephone density will reach 12 - 15 sets/ 100 inhabitants, more than 50% households own telephones. The telecommunication revenue will be 2 - 3 billion USD.

   By the year 2020, the telephone density will reach 20 - 25 sets/ 100 inhabitants, more than 75% households own telephones. Telecommunications services can satisfy all customer demands regardless of location and time, in cities or remote areas.
3. They are: 1. Advanced technology and bandwidth to assist multimedia applications and e-commerce.

   2. Ready and high access ability, both in economy and physical.

B. Translation

VIỄN THÔNG VIỆT NAM BƯỚC VÀO THẾ KỶ 21

Viễn thông được coi là một trong những ngành công nghiệp cơ sở hạ tầng quan trọng nhất của nền kinh tế quốc dân đồng thời là một công cụ hiệu quả cho sự lãnh đạo của Đảng và chính phủ. Vậy nên Chính phủ đã xếp ngành ở vị trí ưu tiên và đã đặt ra những mục tiêu sau trong nhiệm vụ phát triển ngành viễn thông nhằm đạt được những tiêu chuẩn quốc tế.

- Trong 10 năm sắp tới, tốc độ phát triển của công nghiệp viễn thông phải gấp đôi tốc độ phát triển chung của nền kinh tế quốc dân.
- Sau năm 2000, mật độ điện thoại phải đạt từ 3,8 tới 4 điện thoại trên 100 dân, hầu hết các làng trên toàn quốc có dịch vụ điện thoại. Doanh thu viễn thông sẽ đạt khoảng 1 tỷ đô la Mỹ.
- Tới năm 2010, mật độ điện thoại sẽ đạt 12 - 15 máy/ 100 dân, hơn 50% các gia đình có máy điện thoại. Doanh thu trong viễn thông sẽ đạt 2 - 3 tỷ đô la Mỹ.
- Tới năm 2020, mật độ điện thoại sẽ đạt 20 - 25 máy/ 100 dân, hơn 75% các gia đình có máy điện thoại. Các dịch vụ viễn thông có thể đáp ứng mọi nhu cầu của khách hàng tại bất cứ vị trí và thời điểm nào, dù ở thành phố hay khu vực xa xôi.

Đồng thời Tổng cục Bưu điện cũng lập kế hoạch xây dựng một nền cơ sở hạ tầng trong viễn thông nhằm thỏa mãn các yêu cầu sau:

- Công nghệ tiên tiến và độ rộng băng thông lớn nhằm phục vụ các ứng dụng đa phương tiện và thương mại điện tử.
- Khả năng truy nhập sẵn sàng và cao, cả về mặt kinh tế và vật lý (người sử dụng có thể truy nhập vào hệ thống cơ sở hạ tầng viễn thông quốc gia dù ở bất kỳ vị trí nào với giá cả phải chăng).
- Độ an toàn cao nhằm hỗ trợ thương mại điện tử và xu hướng toàn cầu hóa của nền kinh tế toàn cầu. Ngành bưu điện phải tạo nên một môi trường thuận tiện cho hoạt động của tất cả các doanh nghiệp.
- Độ thống nhất cao và tương thích với cơ sở hạ tầng của viễn thông thế giới cũng như trong khu vực. Người sử dụng có thể sử dụng cả dịch vụ trong nước và quốc tế một cách dễ dàng.

(Trích bài phỏng vấn ông Lê Nam Thắng - Vụ trưởng vụ chính sách - Tổng cục Bưu điện)

Exercise 4.

A. Decide whether these ideas are related to market opening (MO), equitisation (EQ) or service popularisation (SP)

1. SP	2. EQ	3. MO	4. MO	
5. EQ	6. EQ	7. SP	8. MO	9. SP

B. Answer the questions.

1. There are 3 main policies: market opening, equitisation and services popularisation.
2. Because Vietnam has officially entered some regional and international organisations such as: ASEAN, APEC and, in the future, WTO.
3. VNPT
4. All telecommunications operators, VNPT, SPT and VIETEL, have the duty of services popularisation.

C. Translate the passage into Vietnamese.

NHỮNG CHÍNH SÁCH

CHO VIỆC PHÁT TRIỂN NGÀNH VIỄN THÔNG VIỆT NAM

Hiện có ba chính sách chính: Mở rộng thị trường, cổ phần hóa và phổ thông hóa dịch vụ.

Mở rộng thị trường là một chính sách quan trọng vì Việt nam đã chính thức ra nhập một số tổ chức quốc tế như ASEAN, APEC, và trong tương lai sẽ là WTO. Hầu hết các nước thành viên của các tổ chức này đang thực hiện chính sách kinh tế thị trường với tính cạnh tranh cao. Các công ty và doanh nghiệp của họ rất có kinh nghiệm hoạt động trong môi trường cạnh tranh. Trong tình hình này, Việt nam cũng cần phải cho phép cạnh tranh để khiến các công ty và doanh nghiệp của mình quen với cạnh tranh và phát triển trong môi trường cạnh tranh. Chúng ta cần phát triển một cách năng động các nguồn lực của chúng ta, đặc biệt là nguồn nhân lực, thúc đẩy khả năng cạnh tranh của chúng ta nhằm hòa nhập tốt với kinh tế trong khu vực cũng như trên quốc tế.

Tuy nhiên việc mở rộng thị trường cũng đòi hỏi phải áp dụng theo phương pháp khoa học phù hợp với điều kiện của chúng ta và với mỗi giai đoạn phát triển. Phương pháp này được thực hiện theo nguyên tắc: đầu tiên, cạnh tranh trong các dịch vụ viễn thông trong nước rồi đến dịch vụ quốc tế; tương tự, trước tiên các dịch vụ giá trị gia tăng rồi tới các dịch vụ cơ bản; các dịch vụ di động rồi tới các dịch vụ cố định.

Để tiến hành chính sách này, hiện nay DGPT đã mở ra thị trường điện thoại nội hạt, thông tin di động và Internet, bên cạnh VNPT, thêm hai nhà hoạt động viễn thông nữa đã được cấp giấy phép (SPT và VIETEL); trong thị trường Internet, có một IAP và 5 ISPs.

Chính sách thứ hai là cổ phần hóa. Nhằm khai thác tất cả các nội lực, Chính phủ đã ra những chính sách nhằm khuyến khích sự tham gia của tất cả các ngành kinh tế trong việc phát triển công nghiệp viễn thông. Nhằm lưu động hóa nguồn vốn từ các ngành kinh tế khác nhau, Chính phủ đã cho phép cổ phần hóa một số công ty và doanh nghiệp nhà nước thuộc lĩnh vực công nghiệp Bưu chính Viễn thông. Nhân viên của các công ty và các doanh nghiệp đó được ưu tiên hàng đầu trong việc mua cổ phần của công ty của họ. Việc này mang lại cơ hội cho người lao động trở thành người chủ sở hữu của chính công ty của mình và vậy nên sẽ dễ dàng nâng cao tính hiệu quả của các công ty và các doanh nghiệp đó.

Trong quá trình cổ phần hóa, DGPT cũng khuyến khích các ngành kinh tế tham gia vào công việc xây dựng cơ sở hạ tầng của ngành thông tin quốc gia. Nguồn lực và vốn cần được lưu động hóa, không chỉ từ các nhà đầu tư trong nước mà còn cả nước ngoài, nhằm đóng góp vào cuộc phát triển cơ sở hạ tầng viễn thông và các ứng dụng dịch vụ.

Chính sách thứ ba là phổ thông hóa dịch vụ. Một trong những mục tiêu của việc phát triển viễn thông ở nước ta là tạo nên những dịch vụ đa dạng, có giá trị nhằm đáp ứng những nhu cầu của khách hàng dù bất cứ thời gian và địa điểm nào. Nhằm tiến hành những mục tiêu này, tất cả các doanh nghiệp viễn thông phải có nhiệm vụ đóng góp vào quá trình phát triển cơ sở hạ tầng viễn thông ở những vùng xa xôi, nơi hoạt động thương mại không có lãi.

Chính sách này đem lại công bằng và đảm bảo cho cạnh tranh lành mạnh giữa các doanh nghiệp Bưu chính Viễn thông và quyền lợi cho người sử dụng. Trước đây chỉ có VNPT, nhưng hiện nay, các nhà hoạt động viễn thông, VNPT, SPT, VIETEL có nhiệm vụ phổ thông hóa dịch vụ thông qua cơ cấu giấy phép và định giá.

DGPT cũng đang suy nghĩ đến việc đưa ra một chính sách phổ thông hóa dịch vụ phù hợp với giai đoạn phát triển cũng như mức mở rộng thị trường, cùng với việc tạo nên một quỹ phổ thông hóa dịch vụ.

(Trích bài phỏng vấn ông Lê Nam Thắng - Vụ trưởng vụ chính sách - Tổng cục Bưu điện)

Exercise 5. Fill in each blank with one suitable given word.

1. switching	2. connection	3. subscribers
4. defines	5. outlet	6. information
7. speech	8. telephone	9. telecommunication

Exercise 6. Read the text then answer the questions.

1. One
2. AT&T
3. MCI, Sprint
4. A requesting long-distance carrier could require that the LEC examine the number and handoff the call to the proper long-distance carrier.
5. From the CO of the LEC to the point of presence of the IXC.
6. In a building adjacent to the telco's CO, or in some convenient site in the suburbs where it could serve several of the telco's COs.
7. No

UNIT 6

Exercise 1. Complete the sentences.

1. call	2. hold	3. moment	4. number
5. could	6. extension	7. speaking	8. back
9. message	10. put	11. this	12. sorry
13. engaged	14. communication		

Exercise 2. Choose the right answers.

1. a	2. b	3. b
4. a	5. a	6. b

Exercise 3. Fill in each blank with one suitable given word.

1. high-performance 2. types 3. fixed-length
4. payload 5. information 6. packets
7. cells 8. multiplexed 9. destinations
10. interfaces

Exercise 4. Fill in the blanks, using suggested words in the most suitable form.

1. switching 2. interconnecting 3. differently
4. handling 5. communication 6. services
7. user 8. switched

Exercise 5. Read the text then match the two columns to make words or phrases.

1. bandwidth 2. electrical signals
3. optical switching 4. switching equipment
5. bit rates 6. space switches
7. commercially available

Exercise 6. Read the text then answer the questions.

1. Software stored in a computer
2. The actual intelligence
3. No.
4. The software was too complex.
5. Simple handling of the equipment; flexible structure; low overall cost (investment, operation, maintenance); extended functions/ services; high degree of reliability.

UNIT 7

Exercise 1. Choose the appropriate form of the words to complete the sentences.

1. a. A b. C c. B 2. a. B b. A c. C
3. a. C b. B/ A c. A/ B 4. a. C b. B c. A
5. a. B b. A c. C

Exercise 2. Choose the appropriate form of the words to complete the sentences.

1. a. B b. A c. D. d. C
2. a. C b. A c. B 3. a. C b. A c. B
4. a. B b. C c A 5. a. B b. A c. C

Exercise 3. Read the passage and choose the correct answer to each question.

1. b 2. a 3. a 4. c 5. b

Exercises 4. A. Put the correct auxiliary verbs into each gap.

a. have b. isn't working c. has d. don't e. am f. was
g. don't h. did i. didn't j. have k. haven't l. does

B. Make questions and then answer the questions.

1. Why is Val ringing Apple Helpline?

   Because she's got a terrible problem with her computer.

2. Which company does Val work for?

   She doesn't work for a company.

3. What was she doing when the computer stopped?

She was working away happily.

4. Why can't Val remember the message?

Because she didn't understand it.

5. Has she switched off her computer?

No, she hasn't.

Exercise 5.

A. Match the two columns.

1. b 2. c 3. d 4. e. 5. a

B. Answer the questions.

1. Telegraph and telephone
2. Facsimile
3. A modem
4. Some method of point-to-point relay.
5. Solid-state circuitry

Exercise 6. A. Match the numbers with the explanations.

1. f 2. d 3. a 4. g 5. e
6. c 7. j 8. i 9. h

B. Translation

QUẢN LÝ CHO MỘT PHƯƠNG HƯỚNG PHÁT TRIỂN ĐÚNG ĐẮN.

Sự kiện khai trương Internet ở Việt nam cách đây 2 năm đã được đón mừng nhiệt liệt. Cho tới nay, số thuê bao Internet ngày càng tăng. Tháng 6 năm 1999, tốc độ phát triển là 30% so với đầu năm 1999, hàng tháng trung bình có 1.500 thuê bao thêm vào mạng. Hiện nay, có 1 IAP, 5 ISP, 14 mạng tư nhân, 16 ICP, và trên 40.000 người sử dụng, không kể 15.000 người sử dụng 14 mạng tư. Theo đánh giá đến năm 2000, Việt nam sẽ có hơn 100.000 thuê bao Internet.

Điều này đặt các nhà chức trách Việt nam trước một nhiệm vụ nặng nề là làm thế nào để Internet Việt nam phát triển theo hướng đúng đắn.

Ông Chu Tuấn Nhạ, Bộ trưởng Bộ Khoa học công nghệ và Môi trường, Giám đốc Ban Hợp tác Quốc gia Internet Việt nam đã khẳng định: Sự hợp tác giữa các Bộ, ngành dưới cơ sở Ban hợp tác Quốc gia Internet đã mang lại những hiệu quả hiển nhiên tới việc phát triển Internet Việt nam. Mặc dù đây là một dịch vụ mới, hệ thống văn bản cần thiết đã gần như đầy đủ cho việc đảm bảo sự phát triển đúng đắn của Internet Việt nam.

Sau khi công bố Nghị định 21/CP về các luật lệ tạm thời trong thiết lập, quản lý và sử dụng Internet ở Việt nam, 136/TTg liên quan đến việc thành lập Ban hợp tác quốc gia, Ban đã nhanh chóng phát hành một bộ 10 văn bản về luật liên quan trực tiếp tới việc hướng dẫn thực hiện nghị định 21/CP. Những tài liệu về luật này đóng vai trò rất quan trọng trong việc tạo nên một môi trường luật pháp cơ bản cho việc tổ chức, quản lý và khai thác các dịch vụ Internet mà lần đầu tiên được giới thiệu tại Việt nam. Vậy là, cuộc cạnh tranh công bằng giữa các nhà cung cấp dịch vụ đã bắt đầu.

Theo đánh giá của Ban, sau 2 năm hoạt động, tất cả các nhà hoạt động có đăng ký (IAP, ISP, ICP) đã cố gắng hết sức để phù hợp với các luật lệ của Nhà nước. Các thông tin được cung cấp trên Internet đã chuyển tải được các thông tin chính thức của Việt nam đến khắp thế giới dưới dạng báo điện tử, nhưng việc phân bố thông tin vẫn hạn chế và trùng lặp.

Từ trước đến nay, mức độ an toàn của việc truyền và thông tin trên mạng đã rất được chú trọng đối với cả nguồn vào và nguồn ra, đặc biệt là nguồn vào. Tuy nhiên, việc quản lý thông tin, đặc biệt là thông tin vào, đã gặp một số khó khăn vì khả năng có hạn của bức tường lửa không đủ mạnh để kiểm soát thông tin có nội dung xấu. Mặc dù người ta đã khuyên IAP, ISP, và ICP cho các mạng tư thiết lập các hệ thống an ninh tại các cổng quốc gia và các máy con thì tại cổng riêng của họ, nguồn tài chính hạn hẹp là nguyên nhân chủ yếu cho thực tế đã nêu ở trên. Mặt khác, xuất hiện một số hình thức sử dụng Internet bất hợp pháp, gây nên khó khăn trong việc đảm bảo an ninh trên mạng.

Trong những năm sắp tới, nền kinh tế Việt nam tiếp tục phát triển cùng với việc mở rộng hợp tác với các tổ chức trong khu vực và quốc tế. Các tri thức hoạt động trên mạng như tài chính điện tử, trao đổi thông tin... sẽ tăng lên.

Exercise 7. Translate into English.

To meet the demands on managing the Internet, Vietnam needs to carry out these 6 main tasks:

- To set up perfect legal documents for Internet development.
- To continue to set up a legal environment and actively participate in the development of Internet.
- To enhance the examination and investigation of infraction activities.
- To facilitate activities of businesses in customer service, to allow for pilot plans of new services; to reconsider of Internet access tariffs.
- To study and apply new services based on the Internet, such as e-commerce.
- To enhance international cooperation; develop technology studies about Internet to quickly apply and deploy new technologies in Vietnam.

Exercise 8. Fill in the blanks with suitable form of the words.

1. accustomed	2. integration	3. applications	4. digital
5. processing	6. devices	7. switches	8. generation

Exercise 9. A. Give the short form for these phrases.

1. CO	2. ga.	3. VBD	4. DAVIC
5. RADSL	6. VDSL	7. xDSL	8. HDSL
9. SLICE	10. FSK	11. QAM	12. ADSL
13. ANSI	14. DMT		

B. Match the names with the characteristics.

1. e	2. a	3. c	4. b
5. f	6. g	7. d	

UNIT 8

Exercise 1. Separate the two texts and put them in the correct order.

Written instructions:	1. h	2. f	3. j	
	4. a	5. e	6. m	7. g
Spoken instructions:	1. l	2. k	3. n	

4. d 5. b 6. i 7. c

Exercise 2. Choose the appropriate form of the words to complete the sentences.

1. a. B b. A c. C 2. a. B b. C c. A
3. a. B b. C c. A 4. a. B b. C c. A
5. a. B b. A

Exercise 3. Choose the one option - a, b, c or d - that best completes the passage.

1. b 2. d 3. c 4. a 5. c
6. c 7. a 8. d 9. b 10. d

Exercise 4. Match these suggestions for extensions to their meanings.

Extension	Meaning
.coop	cooperatives
.edu (.ac in UK)	educational and research
.gov	government
.info	informative
.int	international organisation
.museum	museums
.name	individuals
.net	gateway or host
.org	non-profit organisation
.pro	professionals
.firm	firm or agency
.store	online retail store
.web	Web-related
.arts	cultural or entertainment
. rec	recreational
.nom	personal

Exercise 5. Read the text then match the beginnings and endings to make complete sentences.

1. d 2. f 3. i 4. g 5. b
6. h 7. a 8. c 9. e

Exercise 6. Reading text

A. Complete the text with suitable forms of the given words.

1. connection 2. devices 3. operating 4. modification 5. relatively
6. useful 7. solutions 8. equipment 9. applications 10. operators

B. Match the two columns to make phrases.

CompactPCI systems telecommunications network

system design	transfer mode
CompactPCI bus	individual components
operate) systems	network interfaces
CompactPCI backplane	peripheral chips

Exercise 7. Read the text then choose the most suitable answer.

1. b	2. a	3. b	4. b	5. a
6. b	7. a	8. c	9. c	10. c

UNIT 9

Exercise 1. A. Match the right with one on the left.

1. d	2. b	3. e	4. c	5. a

B. Find a word which means the opposite of the following words and expressions.

1. higher	2. national	3. far/ distant	4. mobile	5. safety
6. giant/ big	7. cheaper	8. allow/ permit	9. landing	10. earth

Exercise 2. Fill in each blank with ONE suitable preposition.

1. over … to	2. about	3. up	4. by	5. to
6. of … in	7. as … in	8. of	9. of	10. to

Exercise 3. Fill in each blank with ONE suitable preposition.

1. satellites	2. based	3. channels	4. system
5. end-user	6. antenna	7. receiver	8. digital
9. computer	10. use		

Exercise 4. Read the passage then answer the questions.

1. Instant connections and clearer conversations
2. To make a phone call, to do one's banking, to rent videos, to buy things. People use their telephone to connect their home computers to computerized information centers. People also send letters and documents through phone by fax. And new systems may be available shortly for sending video pictures over the telephone.
3. No.
4. *A call from a mobile phones travels along radio waves to stations located in different places. From there, the radio signal is connected to the regular phone system*
5. Less wasted time. You don't have to look for a phone booth or use coins to make a call.

Exercise 5. Match the two columns.

1. EMF: extremely high frequency
2. GSM: Global System for Mobile Communication
3. HDTV: High Density TV
4. IF: Intermediate frequency
5. ITU: International Telecommunication Union
6. TU-R: ITU - Regulated
7. LEO: Low earth orbit satellite

8. LOS: Loss of signal
9. MCA: Multi-channel Access
10. pls: please
11. PM: Phase Modulation
12. PTO: Public Telephone Operator
13. SS7: Signalling System No.7
14. VF: Voice frequency

Exercise 6. Read the text then match the two columns.

- A 2 GHz system has a range of approximately 50 kilometres
- The passive link station generally consists of two directly interconnected parabolic antennas without any amplifying electronics between them.
- The active link station links, amplifies or regenerates the signal.
- The distance between the link stations is called the hop length.
- The hop length depends on output power, antenna type, climate and on the frequency
- The link station may be either active or passive.
- An 18 GHz system has a range of 5 - 10 km
- Each radio link needs two radio channels.

Exercise 7. Read the text then decide whether the sentences are true or false. Correct the false ones.

1. T
2. F. Radio can be used locally and intercontinentally.
3. T
4. F. Infrared, visible and ultraviolet light, and X-ray frequencies are other ranges.
5. T
6. F. The radio spectrum is divided into eight frequency bands, form VLF (very low frequency) to VHF (extremely high frequency).
7. T
8. Radio link systems use frequencies between 2 and 14 GHz.

UNIT 10

Exercise 1. A. Give the full forms of the abbreviations.

LEO: low earth orbit
CDMA: code division multiple access
GSM: global system for mobile communications
AMPS: advanced mobile phone service
FDMA: frequency division multiple access
IMTS: improved mobile telephone service
TDMA: time division multiple access

B. Answer the questions.

1. a	2. b	3. a	4. b
5. a	6. b	7. a	8. b

C. Match the two columns to make suitable phrases.

metropolitan area	telecommunications technology
satellite system	geosynchronous satellites
frequency band	voice communications
cell site	copper pairs
transmission technology	digital transmission
dial tone	electronic equipment

Exercise 2. Fill in the blanks with suitable prepositions.

1. c 2. a 3. b 4. c
5. a 6. a 7. c

Exercise 3. A. Fill in the blanks with suitable numbers.

1. 24 2. 80,000 35,800 3. IV
4. 0.5 5. 100

B. Find out what the words in BOLD typeface refer to.

1. They (line 2): satellites used for telecommunications/ geostationary satellites
2. which (line 3): having an orbiting time of 24 hours
3. them (line 3): satellites used for telecommunications/ geostationary satellites
4. which (line 10): a 240 ms delay
5. who (line 14): Intelsat
6. that (line 17): the few stations
7. which (line 18): Intelsat IV

C. Decide whether the sentences are true or false. Correct the false ones.

1. F. Approximately one third of the earth's surface is covered by an antenna with global radiation.
2. F. Intercontinental use of satellites has decreased in favour of optical submarine cables.
3. T
4. F. Satellite links are used in national as well as international telecommunications networks.
5. F. The long distance between terrestrial stations via the satellite causes a 240 ms delay.
6. T 7. T
7. One of Intelsat's satellites is Intelsat IV which has 80,000 voice channels.

Exercise 4. Match the stems and affixes with their definitions.

1.g 2.d 3.c 4.f
5.h 6.e 7.a 8.b

MỤC LỤC

BÀI TẬP

TIẾNG ANH
CHUYÊN NGÀNH ĐTVT

Mã số: 491ANH213

Chịu trách nhiệm bản thảo

TRUNG TÂM ĐÀO TẠO BƯU CHÍNH VIỄN THÔNG 1