**NETWORK AND TELE COMMUNICATION**

Share

1.

a. Telecommunication is a system if transmission of sounds, images, texts or data in the form of electronic signals.

b. Modes for transmitting data from one device to another are Simple, Half-duplex, and full duplex mode.

c. Bandwidth is measured in bits per second.

d. Cat 5 cable is used with RJ-45 connector.

e. Microwave is a wireless technology that can be used to transmit data between two different computers.

f. MODEM is short form of Modulator-Demodulator.

g. Linux is an example of network operating system.

h. Peer-Peer network is group of computers, which acts as server and workstation.

2.

a. False

b. True

c. True

d. True

e. True

f. True

g. False

h. True

3.

WAN = Wide Area Network

MAN = Metropolitan Area Network

UTP = Unshielded Twisted Pair

STP = Shielded Twisted Pair

POP = Post Office Protocol

NIC = Network Interface Card

HTTP = Hyper Text Transfer Protocol

MODEM = Modulator Demodulator

SMA = Shape Memory Alloy

BNC = Baby N Connector

4.

Protocol ---------------> Rules to exchange data

LAN ---------------> Network within a building

MAN ---------------> Network within a city

Coaxial ---------------> BNC

Cat 5 ---------------> RJ-45

Hub ---------------> Central device for star topology

5.

a. Data communication system is the collection of hardware, software and other devices that allows exchanging data, information and voice between two or more devices through a wire or radio waves.

The components of data communication are as follows:

Data: This is the data that is to be communicated.

Sender: This is the device used to send data.

Medium: This is the device through which the sender makes communication to the receiver.

Receiver: This is the device which receives data sent by the sender.

Protocol: This is the set of rules that are followed nu the sender and the receiver to make communication possible.

b. The differences between simplex and duplex modes in communication are as follows:

|  |  |
| --- | --- |
| Simplex Mode | Duplex Mode |
| In this mode, the transmission can take place in only one direction. | In this mode, data can be transmitted in both direction but only to one direction at a time. |
| Examples: TV broadcasting, Radio transmission etc. | Example: Wireless, handset and walky-talky. |

c. Differentiate between bridge and router is given below:

|  |  |
| --- | --- |
| Bridge | Router |
| It is a device that connects two or more similar types of networks. | It is a device that connects two different networks. |
| It does not use the address for filtering and forwarding the data. | It uses the address for filtering and forwarding the data. |

d. A computer network is a logical or physical interconnection between two or more computers such that they could communicate with each other.

The advantages of computer network are as follows:

i. A computer networked environment allows faster, easier and reliable transfer of data files from one computer to another.

ii. A network computer allows sharing of networked connected peripherals and simultaneous access to programs and data irrespective of the physical location of the resources and the user.

iii. Computers in network can access the network connected hardware devices like printer, scanner, disk drives etc.

e. The three models of network are as follows:

i. Client - Server Network

ii. Peer - to - Peer Network

iii. Centralized Computing Network

i. Client Server Network

It is a type of network in which each computer in a network is either a client or a server. It is an arrangement where some programs, files or other resources located on one computer called the server but are available to other systems on the network, called clients.

f. Protocols are the sets of rules that the computer on the network must follow to communicate and to exchange the data with each other.

The names of the protocols are as follows:

FTP = File Transfer Protocol

SMTP = Simple Mail Transfer Protocol

TCP/IP = Transmission Control Protocol/ Internet Protocol

ARP = Address Resolution Protocol

POP = Post Office Protocol

HTTP = Hyper Text Transfer Protocol

PPP =

CDP = Cisco Discovery Protocol

g. Each computer on any types of network needs a hardware component to control the flow of data. The device that performs this function is Network Interface Card (NIC), commonly called network card.

h. A network topology refers to the shape of the network in which all the computers are connected together.

Star Topology

Star topology is a network topology where each individual piece if network is attached to a central node. The attachment of these network pieces to the central component is visually represented in a dorm similar to a star.

i. The advantages and disadvantages of bus topology are as follows:

Advantages

i. It is easy to set up and extend bus network.

ii. Cable length required for this topology is the least compared to other networks.

iii. Bus topology costs very less.

iv. It is mostly used in small networks. It is good for LAN.

Disadvantages

i. It is not suitable for networks with heavy traffics.

ii. It is difficult to detect and troubleshoot fault at individual station.

iii. There is limit on central cable length and number of nodes that can be connected.

iv. Security is very lows because the entire computer receives the sent signals from the source.

j.

Local Area Network

A Local Area Network (LAN) is a network of computers that are relatively near to each other and are connected in a war that enables them to communicate by a cable and a small wireless device. A LAN consists of just two or three computers to exchange data or share resources or it can include hundreds of computers of different kinds.

Metropolitan Area Network

Metropolitan Area Networks (MANs) are large computers networks spread over a city or neighboring cities. A MAN can have a group of many LANs. Especially, big companies, banks, offices etc. have their branches or sub offices in a city or in neighboring cities. They use MAN to connect with their branches or sub offices for communicating data and information. The communication media in MANs may be optical fiber or unbounded communication media like microwave system, infrared system, radiowave to link their branches and sub offices.

Wide Area Network

Wide Area Network is a telecommunications network usually used for connecting computers that spans a wide geographical area. WANs can be used to connect cities, states or even computers. Typically, it will employ communication circuits such as long distance telephone wires, microwaves and satellites. WANs are often used by larger corporations or organizations to facilitate the exchange of data. The world's most popular WAN is the Internet.

k. Difference between LAN and WAN are as follows:

|  |  |
| --- | --- |
| LAN | WAN |
| * A LAN is restricted to a limited geographical coverage of a few kilometers. | * WAN spans greater distance and may operate nationwide or even worldwide |
| * Data transmission speed is much higher in LAN. | * Data transmission speed is slower in WAN than in a LAN |

l. The advantages and disadvantages of star topology are as follows:

Advantages

i. As compared to bus topology, it gives far much better performance.

ii. Easy to connect new nodes or devices. In star topology new nodes can be added easily without affecting rest of the network.

iii. Centralized management. It helps in monitoring the network.

iv. Failure of one node or link does not affect the rest of network. At the same time it is easy to detect and troubleshoot it.

Disadvantages

i. Too much dependency on central devices. If it falls whole network goes down.

ii. The use of hub, router or a switch as central devices increases the overall cost of the network.

iii. Performance and as well number of nodes which can be added in such topology is depended in capacity of central devices.

6.

MODEM

MODEM stands for Modulator Demodulator. It is the device that converts digital data to analog form and vice versa. It is a device used to transfer the data of one computer to another using telephone lines.

Repeater

The signals transmitted become weak due to some problem in the transmission mediums or the distance between the two locations. A repeater is a device that amplifies the incoming signals, creates a new copy of it and transmits the signals on the network. Repeaters are required in the network where computers are a part of each other.

Hub

A hub is a hardware device that relays communication data. A hub sends data packets to all devices on a network, regardless of any MAC addresses contained in the data pocket. It is a device with multiple ports that allows network devices to be connected together. It acts as a central networking device in the star topology.

Bus Topology

A bus topology is a network topology in which nodes are connected in a daisy chain by a linear sequence of buses. It is an arrangement of computers on a local area network in which each computer is connected to a central cable through which data is channeled.

Ring Topology

Ring topology is a network topology in which each node connects to exactly two other nodes, forming a single continuous pathway for signals through each node - a ring. Data travel from node to node with each node along the way handling every packet

7.

a. LAN

b. MSDOS

c. None of them

d. BNC

e. Fiber Optics

f. MAN

g. Modem

h. Router

i. Both of them

j. Simplex Mode

8.

a. Communication

b. Telecommunication

c. Medium

d. Half Duplex Mode

e. Full Duplex Mode

f. Bandwidth

g. Guided Media

h. Unguided Media

i. Computer Network

j.

k. Connectors

l. Repeater

m. Router

n. Modem

o. Protocols

# CYBER LAW AND ETHICS

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1.

a. Cyberspace has become synonyms with the Internet.

b. Cyber Law includes a wide variety of legal issues related to the use of communication technology.

c. Digital signature is a security mechanism system in the cyberspace for digital data processing and their transformation.

d. Cyber-crime refers to illegal actions involved in any computer.

e. The law which is enacted to ensure the preservation, integrity and reliability of data is called Data Protection and Privacy Law.

2.

a. True

b. True

c. False

d. False

e. False

3.

a. UNCITRAL = United Nations Commission on International Trade Law

b. WWW = World Wide Web

c. EDI = Electronic Data Interchange

IT = Information Technology

4.

a. Cyber law refers to all the legal and regulatory aspects of Internet and World Wide Web.

It is important because for the following reasons:

i. It is required to overcome the cybercrime in the internet.

ii. It is important for the eradication of the illegal activities done in the internet.

iii. It touches all the aspects of transactions and activities on and concerning the internet and Cyberspace.

b. Digital Signature is the mathematical scheme for demonstrating the authenticity of a digital message or document.

It is important because it provides a legal framework to facilitate and safeguard electronic transactions in electric medium. It is also necessary to keep the uniformity standard and guarantee in all the activities of the e- sector.

c. The digital signature allows the user to attach a code on the document of electronic records or Electronic Data Interchange (EDI) in various e-sectors for the data transformation such as e-mail, e-banking, e-business etc.

d. Cybercrime is defined as any type of illegal activity that makes use of the Internet, a private or public network, or an in-house computer system.

e. Intellectual property refers to creations of the mind, such as inventions; literacy and artistic works; designs; and symbols, names and images used in commerce.

Intellectual property includes various laws such as copyright law which is related to computer software, computer source code, trademark law which is related to domain names, semi-conductor law which is related to the protection of semi-conductor design and layout.

f. Telecommunication is a system if transmission of sounds, images, texts or data in the form of electronic signals.

g. The purpose of the enactment of the cyber law of Nepal, 2004 are as follows:

i. Provides a legal framework to facilitate and safeguard electronic transactions in the electronic medium.

ii. To facilitate electronic filing of documents with the Government agencies and to promote efficient delivery of government services by means of reliable electronic records.

iii. Provides a detailed provision for the Controller of Certifying Authorities to regulate Certifying Authorities.

iv. Provides legal status to digital signatures sent by the electronic media, which would be an important provision to introduce e-banking.

v. Provides legal status for various banking signatures sent through the electronic media, which will be instrumental in boosting economic activities throughout the world via Internet.

h. Computer ethics is the branch of practical principles that deals with how the computer experts should make decisions in regard to the social and professional behavior. It is a set of moral principles that regulates the use of computers.

The computer ethics are as follows:

i. One should not interfere with other computer's work.

ii. One should not provide fake information.

iii. One should not use the computer to steal.

iv. One should not copy or use proprietary software for which they have not paid.

v. One should not create a virus and use it.

5.

Fair credit reporting Act <-----------------------------> 1970

Copyright <-----------------------------> Intellectual Property

Cyber Law of Nepal <-----------------------------> 2004

Video Privacy Protection Act <-----------------------------> 1988

Copyright Act <----------------------------->1992

Freedom of Information Act <-----------------------------> 1970

Federal Privacy Act<-----------------------------> 1974

Digital Signatures <-----------------------------> Encryption and Decryption

6.

a. 1984

b. Intellectual Property Law

c. Data Protection and Privacy Law

d. Cyber Law

e. 30th Bhadra 2061 B.S.

# INTERNET AND SERVICES

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1.

a. The Internet is a network of Networks.

b. The Internet is useful in different fields such as E-mail, E-commerce and FAQ.

c. The types of MODEM are Internal and external.

d. Internet Browser is software that allows the user to surf information through internet.

e. Chat program allows the users to communicate with each other in the real time.

f. Transmission Control protocol or internet protocol is used to make communication between user's computer and other's computer.

2.

a. False.

b. False.

c. True.

d. True.

e. False.

f. True.

3.

TCP/IP: Transmission Control Protocol / Internet Protocol.

FTP: File Transfer Protocol.

E-mail: Electronic-mail

IRC: Internet Relay Chat.

ARPA: Advance Research Project Agency.

NSF: National Science Foundation.

WWW: World Wide Web.

ISOC: Internet Society.

W3C: World Wide Web Consortium.

IAB: Internet Architecture Board.

IETF: Internet Engineering Task Force.

IRTF: Internet Research Task Force.

INIC: Internet Network Information Centre.

4.

a. The Internet can be described as an interconnection of several thousands of computers of different types belonging to various networks all over the world. The user controls and supervises it.

b. Any three services provided by internet are as follows:

i. E-mail: E-mail is a message distributed by electronic means from one computer user to or more recipients via a network. It is the services of internet in which messages are sent from and received by the servers. E-mail has several advantages over conventional postal services.

ii. Web Chat: Web chat is a program that enables you to communicate with others in real-time through messages. The user can log on to certain websites and communicate with various other users online by using Internet chat software. Chat software is interactive software that allows user to type comment in one window and receive replies in another from someone who is accessing the same software.

iii. World Wide Web: World Wide Web is the leading information exchange service of the Internet. It gives users access to a vast array of documents that are connected to each other by the help of hypertext or hyperlink.

c. E-mail is a message distributed by electronic means from one computer user to or more recipients via a network. The advantages of E-mail are as follows:

i. It is the cheapest and fastest means of communication.  
ii. It is more reliable than postal mail.  
iii. E-mail can be accessed from any part of the world and at any time.

The disadvantages of E-mail are as follows:

i. Virus infection.  
ii. Hacking.  
iii. Misinterpretation.  
iv. Lengthy mails

d. E-commerce is the commercial transactions conducted electrically on the Internet. It refers to a wide range of online business activities for products and services.

Internet telephony can be defined as the technology that converts analog speech signals into digital signals and routes them through packet-switched networks of internet.

e. Difference between IRC and video conference are as follows:

|  |  |
| --- | --- |
| IRC | Video conference |
| It allows the users to communicate with each other at the real time but it doesn't include sound and picture. | It allows the users to communicate with each other and it provides sound as well as pictures. |

f. Video conferencing means making communication between the users using sounds as well as pictures.

g. FTP stands for File Transfer Protocol. It is the protocol that allows transferring files from one computer to another. It is necessary for transferring files and allowing the users to upload and download the files from the remote computer.

5.

a. Mail concerning devices.   
b. Can address many users.  
c. Dial-up network.  
d. TCP/ IP.  
e. Transfer files from one computer to another.  
f. Service of the Internet.

6.

a. E-commerce   
b. Videoconference  
c. Telnet  
d. Internet Telephony  
e. Internet Browser

7.

i. Internet<-----------------------------> Network of Networks  
ii. HTTP <----------------------------->Protocol  
iii. Email <-----------------------------> Service of Internet  
iv. ISP <-----------------------------> Service Provider

**COMPUTER SECURITY**

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1.

a. In the computer, we store important data and information, which can be destroyed, damaged, hacked, etc. by different factor.

b. The recommended computer room temperature should be 21-24 degree Celsius.

c. Due to faulty writing or overloaded sockets, short circuits can take place, which can cause fire and damage the computer.

d. UPS is a battery supported power unit between an external power source and a computer system, which supplies clean and continuous power even during power failure.

e. Computer virus is a computer program that has been created to damage your computer system.

2.

a. False

b. True

c. True

d. True

e. True

3.

a. Computer security refers to the protection of computer system and its valuable information against unwanted access, damage, modification or destruction. Some computer hardware security measures are as follows:

i) Regular maintenance

ii) Insurance

iii) Dust free

iv) Air condition system etc.

And some computer software security measures are as follows:

i) Password protection

ii) Backup system

iii) Defragmentation

iv) Scan disc

b. The protection of all hardware components used in computer system is known as hardware security. The computer equipment, software and data need to be protected from physical harm like fire, lightening, water, etc. as well as damage or theft, which is possible by hardware security which helps in protection of computer system.

c. Software security secure the data and software from getting lost and damaged and helps to insure privacy. It also protects data and software from the computer viruses. So, software security helps to prevent data loss.

d. Backup is a copy of a file which is used in the event of the original file being corrupted.

Data backup protect the user against may failures such as:

i. Media failure

ii. Accidental file deletion

iii. Theft and natural disaster

e. A password is a secret word or phrase that gives a user access to a particular program or system. Any four good criteria for a strong password are as follows:

i. Do not keep a password which can be easily guessed such as date of birth, nickname, etc.  
ii. Do not keep a password that is similar to your name or surname.  
iii. Do not keep word as a password that is currently popular.  
iv. Keep changing your password regularly.

f.

i. Scandisk: Scandisk is a process, which involves in maintaining the disk files and folders using a kind of utility software.

ii. Computer virus: Computer virus is a computer program that is designed to copy itself and infects or damages a computer without permission or knowledge of a user.

g. A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. The voltage regulators used in computer system are as follows:

i) LM723  
ii) LM117  
iii) MC1723

h. The differences between defragmentation and fragmentation are as follows:

|  |  |
| --- | --- |
| Defragmentation | Fragmentation |
| * Defragmentation is the process of locating the noncontiguous fragments of data, rearranging the fragments and restoring the, into fewer fragments or into the whole file. | * The scattering of the parts of the same disk file over different locations is called fragmentation. |
| * It increases the data access and retrieval speed of the disk. | * It decreases the data access and retrieval speed of the disk. |

4.

a. Hardware & software security.

b. Both i and ii.

c. Both i and ii.

d. Voltage regulator device.

e. Utility software.

f. Securing data and information.

g. None of the disk

5.

a. Anti-viruses.

b. Backup.

c. UPS.

d. Virus.

e. Password.

f. Fragmentation.

g. Defragmentation.

6.

i) Backup <-----------------------------> Copy of data  
ii) password <-----------------------------> allows the user to access system  
iii) Scan Disk <-----------------------------> Utility software  
iv) Computer virus <-----------------------------> Software that destroys data

# COMPUTER VIRUS

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1. Fill in the blanks

a. A computer virus is a type of program that replicates itself by making copies of itself without your knowledge.

b. Multipartite viruses can infect both the application programs and the boot sector of a disk.

c. A macro virus is a type of computer virus that infect both the application programs and the boot sector of a disk.

d. Boot sector viruses replace the boot record program of a system disk.

e. Antiviral software is designed to detect and remove viruses from computer system.

2.

a. True

b. False

c. False

d. True

e. True

3.

a. A computer virus is a type of computer program that can replicate itself by making copies of itself by making copies of itself without the user's knowledge or consent.

b. Computer virus spread from following ways:

i. Opening the infected email attachment.

ii. By downloading infected programs from the internet.

iii. By using infected floppy disk, pen drives and CDs.

iv. By transferring an infected program over a network and executing it.

c. The various type of computer virus are as follows:

i) Boot Sector Virus

Boot Sector virus is regarded as one of the most hostile types of virus, a boot sector virus infects the boot record of a hard or a floppy disk. The virus moves the boot sector data to a different part of a disk. This virus allows the actual boot sector data to be read as though a normal start up were occurring.

ii) File Infecting Virus

This type of virus infects program files on a disk. When infected program is launched, the virus code is also launched. After the virus code has been launched, it will normal load and execute the program that has been infected.

iii) Multipartite Virus

This virus is the combination of parasitic and boot sector virus and due to this, it is able to infect both the files or boot sector of a disk. They infect program files and when it is executed, these viruses affect the boot record.

iv) Macro Virus

These viruses infect the Microsoft Office programs such as Excel, Word, Access and PowerPoint. When we open the Microsoft program then the virus is loaded and it affects the normal template or document. Since it is attached in the document, if the infected document is opened on other computer, it affects the computer too.

v) Script Virus

Script Virus is written in script programming languages, such as VBScript and JavaScript. It can infect a computer through various scripting environments, such as Windows Help, Windows installation files and Windows registry files.

d. Boot sector virus destroys or infects the boot sector of the disk where Master Boot Record (MBR) is stored. MBR is a small program which is responsible for booting the computer system.

e. The symptoms of computer viruses are as follows:

i. Programs take long time to load.

ii. Renaming all the files with different names.

iii. Shows unusual error messages on the screen frequently.

iv. Corrupt or deletes system data and programs.

f. Anti-virus software is a computer program designed to detect and remove viruses from the computer system. Any two examples are as follows:

i. McAfee Antivirus ii. Kaspersky Antivirus

g. We can avoid the virus attacks by following ways:

i. Scanning the email attachment before executing them.

ii. Use of a good anti-virus program to scan for viruses.

iii. Scanning the disk frequently for viruses.

iv. Not installing the pirated software, especially computer games.

4.

a. Destructive program

b. Master Boot Record

c. McAfee

d. Boot sector & program virus

5.

a. Viruses.

b. Macro virus.

c. Anti-virus

d. Program virus.

# MULTIMEDIA AND ITS APPLICATION

1.

a. Multimedia is the multiple forms of media.

b. CD-ROM is used to store data and information in the multimedia technology.

c. Multimedia enhances the information for better communication and understanding.

d. Virtual Reality is an artificial environment created with the computer hardware and software and presented to the user in such a way that it appears real.

e. Virtual reality uses headsets and data gloves.

2.

a. True  
b. False   
c. False  
d. False  
e. True

3.

a. Multimedia is a computer delivered electronic system which allows the user to control, combine, and manipulate different types of media. The media used in multimedia technology are text, sound, graphics, animation etc.

b. Multimedia is a system, which has the capability to integrate two or more types of media such as text, graphics, animation, audio and video. It also has the capabilities of getting input, digitizing, compressing, decompressing, storing, retrieving the data and information and demonstrating them in an interactive manner. For example:

c. Multimedia technology is very popular specially to share the ideas, views, thought of the people in an effective and interactive way.

d. A CD-ROM is light, cheap, durable ad portable storage media is used to store data and distribute information in the multimedia technology. Hence, CD-ROM is popular in multimedia technology.

e. Several movies, nowadays, contain many visual tricks, which could never be accomplished without the aid multimedia technology. In the movies, a man being transformed to ghost, woman etc. are shown by using multimedia graphic technique called morphing. English movies like Titanic, Robot, etc. have used multimedia technology for providing special effects. In the cartoon films, the natural movement of cartoon pictures is shown using the animation of multimedia technology.

f. Using a multimedia program, which incorporates text and sound, a learner can see words and phrase on the screen as they are pronounced by the computer program. The learner also has flexibility to request the computer to pronounce any word displayed on screen by selecting that word. Additional features may be incorporated in the program to assist in faster learning process.

g. Due to the arrival of multimedia technology, it is making possible to keep interactive and exciting sound, graphics or animation in the video games available in the computer. Sound and animation have been made possible to adopt in the video game by multimedia technology. Graphics are particularly important features in these applications that make the game thrilling and exciting for the user.

h. For sales promotion, companies often advertise their products and services on television. Several of these advertisements use computer animation effectively communicate the usefulness of the products or services.

i. Multimedia is used for education and training in schools. It is used for education to produce computer based training and reference books like encyclopedia. It allows the students to learn different subjects at their own pace. It also brings presentations alive with sounds, movies, animations and interactivity and motivates students to become active participants in the learning process.

j. The advantages of multimedia are as follows:

i. It can store data and information for a long period of time  
ii. It increases learning effectiveness.

The disadvantages of multimedia are as follows:

i. Acquisition or rental of equipment to produce multimedia can be costly.  
ii. Copying and altering digital images may unknowingly lead to copyright infringement.

k. Virtual Reality is an artificial environment created with computer hardware and software and presented to the user in such a way that it appears real.

4.

a. All of them

b. All of them

c. classroom

d. CD-ROM

e. Window XP

5.

a. Multimedia

b. Graphics

c. Animation

d. Virtual Reality