B2.4-R4 : DATA COMMUNICATION AND NETWORK TECHNOLOGIES

अवधि : 03 घंटे
DURATION : 03 Hours

अधिकतम अंक : 100
MAXIMUM MARKS : 100

ओएमआर शीट सं. :
OMR Sheet No. :

रोल नं. :
Roll No. :

उत्तर-पुस्तिका सं. :
Answer Sheet No. :

परीक्षार्थी का नाम :
Name of Candidate : _____

परीक्षार्थी के हस्ताक्षर :
;**Signature of Candidate :** _____

PART ONE

(Answer all the questions)

1. **Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein.**

(1x10)

1.1 In which data transfer method, does a continuous stream of data signals is accompanied by timing signals ?

(A) Asynchronous

(B) Synchronous

(C) Both

(D) None of the above

1.2 Which layer is not a part of TCP/IP model ?

(A) Application

(B) Transport

(C) Physical

(D) Session

1.3 _____ is designed to avoid collision generated by nodes transmitting signals simultaneously, used mostly in hard real-time systems.

(A) CSMA/CA

(B) CSMA/CD

(C) Virtual CSMA

(D) None of the above

1.4 Which of these is the best option for short range transmission ?

(A) Radio wave

(B) Micro wave

(C) Infrared

(D) Satellite

1.5 The _____ scheme is based on spread spectrum.

(A) FDMA

(B) CDMA

(C) TDMA

(D) PDMA

1.6 Delivery of datagrams between end systems located on different networks is called ?

(A) Transmission

(B) Routing

(C) Switching

(D) None of the above

1.7 Which of the following is a type of routing protocol for unicast communication ?

(A) Distance vector

(B) Core Based Tree

(C) Multicast Shortest Path First

(D) None of the above

1.8 Which of the following is an application-layer Internet standard protocol used by e-mail clients to retrieve e-mail from a server in an IP network ?

(A) SMTP

(B) FTTP

(C) HTTP

(D) POP

1.9 Which network security system monitors and controls incoming and outgoing network traffic based on predetermined security rules ?

(A) Proxy Server

(B) VPN

(C) Firewall

(D) Simple Network Management Protocol

1.10 Which one is the highest reliable topology among the following ?

(A) Bus

(B) Star

(C) Mesh

(D) Ring

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.**

(1x10)

2.1 The Transport layer is responsible for the node to node delivery of the message in OSI model.

2.2 The Internet Protocol is an application protocol for distributed, collaborative, and hypermedia information systems.

2.3 A virtual private network (VPN) extends a private network across a public network, and enables users to send and receive data across shared or public networks.

2.4 ICMP stands for Internet Connection Message Protocol

2.5 The Domain name system describes the machines location in a name space from right to left.

2.6 IP Address of a device is a unique identifier assigned to a network interface controller (NIC) for communications at the data link layer

2.7 De-Multiplexing is a method by which multiple analog or digital signals are combined into one signal over a shared medium

2.8 Phase-shift keying (PSK) is a digital modulation process which conveys data by changing (modulating) the phase of a constant frequency reference signal

2.9 A modem is a bidirectional device.

2.10 A computer network that spans a relatively large geographical area is called local area network.

3. Match words and phrases in column X with the closest related meaning/word(s)/phrase(s) in column Y. Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

	X		Y
3.1	CDMA	**A.**	intermediary for requests from clients to other
3.2	Slotted Aloha	**B.**	128 bit address
3.3	LAN	**C.**	Channel access method
3.4	Error correction	**D.**	Send and receive mail messages
3.5	SMTP	**E.**	network of machines in small geographical area
3.6	IPv6	**F.**	techniques to try to avoid network collapse
3.7	Congestion control	**G.**	transport layer security
3.8	Internet	**H.**	enables reliable delivery of data over unreliable channels
3.9	Proxy Server	**I.**	system of interconnected computer networks
3.10	TLS	**J.**	random Access protocol
		K.	Small Mail Transfer Protocol
		L.	32 bit address
		M.	Carrier Division Medium Access

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Choose the most appropriate option, enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.   (1x10)

A.	www	B.	Network	C.	Telnet
D.	transport layer security	E.	open shortest path first	F.	Half duplex
G.	router	H.	wireless adhoc network	I.	CSMA
J.	CDMA	K.	DNS	L.	continuous
M.	Antivirus				

4.1 _____ transmission mode, data can be sent bi-direction once at a time.

4.2 Routers operate at _____ layer of the OSI model.

4.3 _____ is a media access control (MAC) protocol in which a node verifies the absence of other traffic before transmitting on a shared transmission medium.

4.4 Network operating systems can be embedded in a _____ or firewall that operates the functions in the network layer.

4.5 _____ is a routing protocol for IP networks. It uses a link state routing algorithm and falls into the group of interior gateway protocols (IGPs).

4.6 _____ is a protocol used on the Internet or local area network to provide a bidirectional interactive text-oriented communication facility using a virtual connection.

4.7 _____ is an information space where documents and other web resources are identified by Uniform Resource Locators (URLs), interlinked by hypertext links.

4.8 Mobile Adhoc Network (MANET) also called as_____.

4.9 In HTTPS, the communication protocol is encrypted using_____,

4.10 _____frequency shift keying has no phase discontinuity between symbols.

PART TWO

(Answer any FOUR questions)

5. (a) What is the difference between message switching and packet switching ? Explain with an example.

(b) Discuss the differences between Ethernet, Fast Ethernet, and Gigabit Ethernet based on their various characteristics.

(c) Both UDP and IP are connectionless protocols. At which layer these protocols work? Why is there a need of UDP over IP ? Would it not be enough to just let user processes send raw packets ?

(4+5+6)

6. (a) A Company ZSV has obtained an IP address from ISP as 200.34.22.0. Company wants to create six subnets. Answer the following:

   (i) Default mask for company address

   (ii) Network address of each subnet

   (iii) Range of host addresses in each subnet

   (iv) Number of bits for subnet and host

(b) For the below given network, compute the shortest path from node E to all other nodes in the network using the Link state routing algorithm. Show all the intermediary steps
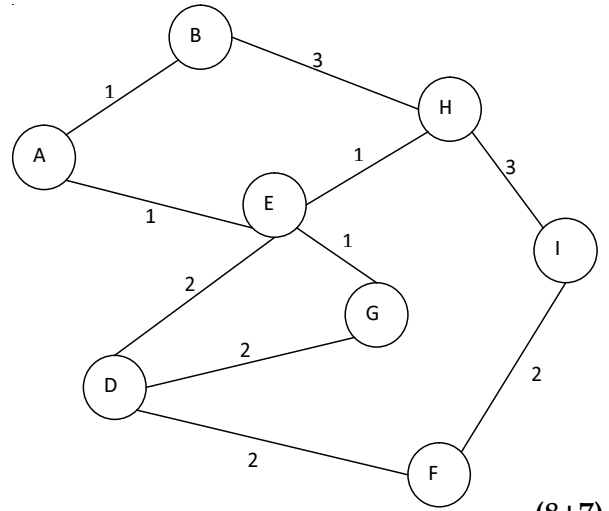
(8+7)

7. Write short notes on **any three** of the following :

(a) SMTP

(b) Cellular Radio

(c) Domain Name System

(d) X.25

3x5

8. (a) A slotted aloha has 1000 stations. Each station generates 5 new frames per second. Each frame is of 100 bits and the channel data rate is 4Mbps. Answer the following

   (i) What is the channel load?

   (ii) What is the Throughput?

   (iii) What is the average number of attempts needed for a successful transmission ?

(b) In distance vector routing, when does the problem of "count to infinity" occur? Explain with help of scenario and also suggest some methods to prevent this.

(c) Define multiplexing. Explain in which situations, multiplexing is required. Differentiate between Frequency division, Time division and Wavelength division multiplexing techniques.

(3+6+6)

9. (a) Define firewall. What are the three types of firewalls?

(b) Discuss features of NMS.

(c) Define Cryptography. Discuss its application in network management.

5+5+5

- o O o -

SPACE FOR ROUGH WORK