Sl. No.

B2.4-R4 : DATA COMMUNICATION AND NETWORK TECHNOLOGIES

DURATION : 03 Hours   **MAXIMUM MARKS : 100**

OMR Sheet No. :

Roll No. :   Answer Sheet No. :

Name of Candidate : _____ ; Signature of Candidate : _____

INSTRUCTIONS FOR CANDIDATES :

• Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.

• Question Paper is in English language. Candidate has to answer in English language only.

• There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

• **PART ONE** is Objective type and carries **40** Marks. **PART TWO** is Subjective type and carries **60** Marks.

• **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.

• Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator.

• **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**

• After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respect.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE

(Answer ALL Questions; each question carries ONE mark)

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 _____ layer deals with the mechanical and electrical specifications of the interface as well as transmission medium.

    (A) Network

    (B) Transport

    (C) Physical

    (D) Data Link

1.2 Routers are used at which layer in TCP/IP protocol suite ?

    (A) Application

    (B) Transport

    (C) Network

    (D) Physical

1.3 The minimum size of the process data that can be encapsulated in a UDP datagram is _____.

    (A) 0 bytes

    (B) 4 bytes

    (C) 8 bytes

    (D) 16 bytes

1.4 Which of the following is a three-way hand-shaking authentication protocol that provides greater security than PAP ?

    (A) Password Authentication Protocol (PAP)

    (B) Challenge Handshake Authentication Protocol (CHAP)

    (C) Network Control Protocols

    (D) None of the Above

1.5 Which of the following keeps track packets that a message is divided into for efficient routing through the Internet ?

    (A) Address Resolution Protocol (ARP)

    (B) Internet Protocol (IP)

    (C) Hypertext Transfer Protocol (HTTP)

    (D) Transmission Control Protocol/Internet Protocol (TCP/IP)

1.6 Internet Control Message Protocol (ICMP) is used at _____ layer of TCP/IP protocol suite.

    (A) Network

    (B) Transport

    (C) Application

    (D) Host to Network

1.7 In SONET each frame lasts _____ micro seconds.

(A) 20

(B) 64

(C) 125

(D) None of the above

1.8 Which of the following is not a routing strategy ?

(A) Fixed routing

(B) Adaptive routing

(C) Random routing

(D) Float

1.9 Firewall is normally installed in

(A) Transport layer

(B) Data Link layer

(C) Network layer

(D) None of the above

1.10 The qualifier differential to PSK means that _____.

(A) it uses phase shifts of multiple of 900

(B) it uses phase shift of 450

(C) phase shift is with reference to the previous bit transmitted

(D) None of the above

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 A bridged network allows communication between two computers on one segment to occur simultaneously as communication between two computers on another segment.

2.2 Today's Cellular networks employ all three multiple access schemes namely FDMA, TDMA and CDMA.

2.3 FSK is a technique that can be considered as a frequency modulated binary PCM.

2.4 ADSL provides a lower bit rate downstream than upstream.

2.5 Packet switching is generally more efficient than packet switching for non-voice communication.

2.6 For separating channels in FDM, it is necessary to use time slots.

2.7 10Base5 and Thick Net are the same term used for a type of LAN implementation.

2.8 The logical address identifies a process on a host.

2.9 Multicast address in IPV4 are those that start with the pattern 1100.

2.10 Transmission mode(s) used in FTP is/are stream.

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	_____ is the most common technique to change an analog signal to digital data.	**A.**	HTTP
3.2	ASK + PSK = _____.	**B.**	SMTP
3.3	The main protocol used to access data on the World Wide Web is called _____.	**C.**	28 bytes
3.4	ARP packet size is _____ .	**D.**	Telnet
3.5	Client/Server application that allows a user to logon to a remote machine, giving the user access to the remote system.	**E.**	chips
3.6	CDMA is based on coding theory and uses sequences of numbers called	**F.**	LDAP
3.7	An application protocol for accessing and maintaining distributed directory information services over an IP network is _____ .	**G.**	Quadrature Amplitude Modulation
3.8	GSM uses two bands for _____ .	**H.**	Duplex communication
3.9	A user-to-network interface (UNI) is the interface between a user and _____ .	**I.**	Pulse Code Modulation
3.10	Building a routing table in Link State Routing (LSR) and dissemination of LSPs to every other router is called	**J.**	ATM Switch
		K.	64 bytes
		L.	FTP
		M.	Flooding

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	Supernetting	B	Node to Node Communication	C	Frame Bursting	D	Simple Network Management Protocol
E	Glass or Plastic	F	Bandwidth	G	2v	H	Random
I	URL	J	SONET	K	-2v	L	Delay
M	Process to Process Communication						

4.1 Data link layer control deals with _____.

4.2 Protocols used for pulling messages from a mail server is _____.

4.3 Multiple Access Protocols are _____.

4.4 _____ defines four layers: path, line, section, and photonic.

4.5 To improve efficiency of Bursting Carrier extension, _____ was proposed.

4.6 _____ combines several networks into one large one.

4.7 The inner core of an optical fiber is _____ in composition.

4.8 _____is the difference between highest and lowest frequencies of a composite signal.

4.9 Each page is assigned _____ that effectively serves as the page's worldwide name.

4.10 The minimum amplitude of a sine wave is _____, if maximum amplitude is 2V.

PART TWO

(Answer ANY FOUR questions)

5. (a) What is subnetting ? Write down the number of blocks and block size in classful IPv4 addressing.

 (b) Define the following: switches, hub, routers, gateway, repeater.

 (c) What is Multiplexing ? List the types of multiplexing techniques and explain any one.

(5+5+5)

6. (a) Define and differentiate classful and classless addressing.

 (b) Discuss features of NMS.

 (c) What is wireless networking ? What is the relationship between wireless networking and IEEE 802.11 ? If a computer is connected to a wireless LAN, can it communicate with computers on a wired LAN as well ?

(5+5+5)

7. (a) Define E-mail. Explain about E-mail protocols - SMTP, POP3, and IMAP.

 (b) What is encryption and encryption scheme ? Differentiate between Private Key Cryptography and Public Key Cryptography.

(7+8)

8. (a) Compare three key long-distance communication technologies named X.25, frame relay and ATM.

 (b) How to distinguish a multicast address in IPV4 addressing ? How can we do so in IPV6 addressing ?

 (c) What is DNS ? Which protocol is used by DNS and why ?

(6+5+4)

9. Write short notes on **any three** :

 (a) DHCP

 (b) HDLC

 (c) Cellular Radio

 (d) Go Back-N protocol

(5+5+5)

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SPACE FOR ROUGH WORK