

NOTE:

IMPORTANT INSTRUCTIONS:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
2. **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.
3. 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**.

TOTAL TIME: 3 HOURS

TOTAL MARKS: 100
(PART ONE – 40; PART TWO – 60)

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 Which of the following lines that are used by the telephone companies to provide high-data-rate connections also use the high-bandwidth capability of unshielded twisted-pair cables?
 - A) PSTN
 - B) Full duplex
 - C) Fiber optics
 - D) DSL
 - 1.2 The LLC provides how many data link control protocol for all types of IEEE LANs?
 - A) One
 - B) Two
 - C) Four
 - D) Eight
 - 1.3 Advanced Mobile Phone System (AMPS) operates in the
 - A) ISM 800-MHz band
 - B) ISM 900 MHz band
 - C) ISM 1900-MHz band
 - D) ISM 2100-MHz band
 - 1.4 Which of the following is not a type of guided media?
 - A) coaxial cable
 - B) fibre-optic cable
 - C) twisted-pair cable
 - D) wave guide
 - 1.5 When two or more devices are connected to the same link, which of the following protocol is necessary to determine which device has control over the link at any given time?
 - A) Data Link layer protocol
 - B) Network layer protocol
 - C) Presentation layer protocol
 - D) Application layer protocol

- 1.6 In which of the following the stations communicate with one another as though they belonged to a physical segment even when they are separated by long distance.
- A) LAN
 - B) MAN
 - C) WAN
 - D) Virtual LAN
- 1.7 Which of the following is not intra domain routing protocol?
- A) Distance vector routing protocol
 - B) Link state routing protocol
 - C) Border Gateway Protocol (BGP)
 - D) Routing Information Protocol (RIP)
- 1.8 Which of the following is a client/server protocol designed to provide physical address to logical address mapping?
- A) BOOTP
 - B) ARP
 - C) RARP
 - D) DHCP
- 1.9 What should be the value of protocol field in IPv4 datagram format for IGMP?
- A) 1
 - B) 2
 - C) 6
 - D) 17
- 1.10 In which of the following one channel carries all transmissions simultaneously?
- A) FDMA
 - B) TDMA
 - C) CDMA
 - D) All of the above

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the “OMR” answer sheet supplied with the question paper, following instructions therein. (1x10)

- 2.1 The addition of stop and start bits and the insertion of gaps into the bit stream make asynchronous transmission slower than forms of transmission that can operate without the addition of control information.
- 2.2 X.25 has extensive flow and error control at the data link layer only.
- 2.3 High Rate Direct Sequence Spread Spectrum (HR-DSSS) is a signal generation method similar to DSSS except for the encoding method (CCK).
- 2.4 In line-of-sight propagation, very low-frequency signals are transmitted in straight lines directly from antenna to antenna.
- 2.5 Consultative Committee for International Telegraphy and Telephony (CCITT) an international standards group now known as the ITU-T.
- 2.6 Polling works with topologies in which one device is designated as a primary station and the other devices are secondary stations.
- 2.7 To overcome address depletion and give more organizations access to the Internet, classful addressing was designed and implemented.
- 2.8 To solve the problem of gigantic routing tables, we can create a sense of hierarchy in the routing tables.
- 2.9 The discard eligibility (DE) bit indicates the priority level of the frame.
- 2.10 Global System for Mobile Communication (GSM), a second-generation cellular phone system is used in America.

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	The most common technique to change an analog signal to digital data (digitization) is called	A.	a frequency-domain plot
3.2	Circuit switching takes place at	B.	frames
3.3	Wavelength-Division Multiplexing (WDM) is conceptually the same as FDM, except that the multiplexing and demultiplexing involve optical signals transmitted through	C.	Coaxial cable
3.4	Radio waves, for the most part, are	D.	IP header
3.5	The data link layer divides the stream of bits received from the network layer into manageable data units called	E.	TCP segment
3.6	Today, millions of Internet users who need to connect their home computers to the server of an Internet service provider use	F.	fiber-optic channels
3.7	TCP/IP is an unreliable and connectionless protocol is called	G.	PVC connections
3.8	Frame Relay was originally designed to provide	H.	a best-effort delivery service
3.9	IPSec in the transport mode does not protect the	I.	omnidirectional
3.10	To show the relationship between amplitude and frequency, we can use what is called	J.	pulse code modulation (PCM)
		K.	LLC
		L.	PPP
		M.	the physical layer

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

A.	Carrier sense multiple access (CSMA)	B.	datagram	C.	Stream Control Transmission Protocol (SCTP)
D.	escape character (ESC)	E.	Internet Control Message Protocol (ICMP)	F.	a random access
G.	TCP/IP	H.	adaptive delta modulation	I.	NAT
J.	Infrared	K.	Microwaves	L.	IEEE
M.	Congestion				

- 4.1 In _____; the value of δ changes according to the amplitude of the analog signal.
- 4.2 _____ requires that each station first listen to the medium (or check the state of the medium) before sending.
- 4.3 Source routing bridges were designed by _____ to be used with Token Ring LANs.
- 4.4 _____, due to their unidirectional properties, are very useful when unicast (one-to-one) communication is needed between the sender and the receiver.
- 4.5 In _____ method, each station has the right to the medium without being controlled by any other station.
- 4.6 The _____ is a mechanism used by hosts and gateways to send notification of datagram problems back to the sender.
- 4.7 _____ enables a user to have a large set of addresses internally and one address, or a small set of addresses, externally.
- 4.8 If one of two consecutive datagrams must be discarded due to congestion, the _____ with the lower packet priority will be discarded.
- 4.9 The _____ provides support for newer applications such as voice over the Internet.
- 4.10 In byte stuffing (or character stuffing), a special byte is added to the data section of the frame when there is a character with the same pattern as the flag. The data section is stuffed with an extra byte. This byte is usually called the _____.

PART TWO
(Answer any **FOUR** questions)

- 5.**
- a) Define the terms Unicasting, Multicasting and Broadcasting. Name the categories of Multiplexing.
 - b) Today, many of the most popular modems available are based on the V-series standards published by the ITU-T. List and explain the standards of modem.
 - c) What is Pulse Code Modulation (PCM)? Explain pulse amplitude modulation.
- (5+6+4)**
- 6.**
- a) What is virtual circuit? Write the differences between virtual circuits and parallel virtual circuits.
 - b) A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces
 - i) 1000 frames per second
 - ii) 500 frames per second
 - iii) 250 frames per second
 - c) Differentiate following:
 - i) Hub and Switch
 - ii) Repeater and Bridge
 - iii) Router and Gateway
- (3+6+6)**
- 7.**
- a) Write the standard polynomials used by ATM header, ATM AAL, HDLC, LANs for CRC generation.
 - b) What is ISM band? Explain the use of ISM band in our day to day life.
 - c) What are the different link types used to build a computer network? What are the different categories of Transmission media?
- (4+6+5)**
- 8.**
- a) Define Bandwidth and Latency. What are the key design issues of a computer Network?
 - b) Windows NT supports both file transfer protocol (FTP) and trivial file transfer protocol (TFTP) under its implementation of TCP/IP. Write the difference between FTP and TFTP.
 - c) What is firewall? Explain how proxy server can work as firewall.
- (4+6+5)**
- 9.**
- a) What is the Open System Interconnection (OSI) model? List the responsibilities of each layer.
 - b) Contrast and compare distance vector routing with link state routing.
 - c) What are the key elements of protocols?
- (7+5+3)**