

B2.4-R3: DATA COMMUNICATION AND COMPUTER NETWORKS

NOTE:

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 **TEAR-OFF ANSWER SHEET** only, attached to 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 “tear-off” answer sheet attached to the question paper, following instructions therein. (1 x 10)**
 - 1.1 Which one of the following is a balanced interface?
 - A) RS-232C
 - B) RS-423C
 - C) RS-449
 - D) RS-422
 - 1.2 A crossbar switch having n input lines and n output lines (i.e. n full duplex lines) has following number of intersections.
 - A) n
 - B) $2n$
 - C) n^2
 - D) $2n^2$
 - 1.3 Video on demand, Live television, from many sources, full motion multimedia, electronic mail is offered by
 - A) X.25
 - B) Frame Relay
 - C) N-ISDN
 - D) B-ISDN
 - 1.4 The device operating at Data link layer is
 - A) Bridge
 - B) Router
 - C) Repeater
 - D) None of the above

- 1.5 Flow control is the mechanism to regulate the flow of information, so that a fast host cannot overrun a slow one. This is the function of the following OSI Layer
- A) All Layers
 - B) Physical Layer
 - C) Transport Layer
 - D) Application Layer
- 1.6 The T1 carrier corresponding to time division multiplexing consists of following number of voice channels
- A) 24
 - B) 12
 - C) 20
 - D) 32
- 1.7 In Cellular Mobile Communication handoff means
- A) to disturb the signal
 - B) to disturb the antenna
 - C) to switch to a new channel when call is in progress
 - D) to switch off the MTSO
- 1.8 GSM stands for
- A) Good Service Management
 - B) Global Service Management
 - C) Good Sender Memory
 - D) Global System for Mobile Communications
- 1.9 Dual cable and signal cable are the two types of
- A) Broadband networks
 - B) Baseband networks
 - C) Radio networks
 - D) Satellite networks
- 1.10 TELNET, FTP, SMTP, Protocols fall in the following layer of OSI reference model
- A) Transport Layer
 - B) Internet Layer
 - C) Network Layer
 - D) Application Layer

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the “tear-off” sheet attached to the question paper, following instructions therein. (1 x 10)

- 2.1 The cells used in Mobile Communications are triangular in shape.
- 2.2 X.25 is based on virtual circuit.
- 2.3 Two commonly used data link layer standards are RS-232-C and its successor RS-449.
- 2.4 PCM is not a common digital modulation method.
- 2.5 The ATM cells are 64 bytes long.
- 2.6 IP is a best-effort connectionless protocol.
- 2.7 The most popular network system in the PC world is Novell Netware.
- 2.8 The remote controls of TVs, VCRs and Stereo use Radio waves.
- 2.9 A new development in the communication satellite world is development of low cost microstations, sometimes called VSATs (Very Small Aperture Terminals).
- 2.10 Routing and switching in frame relay are performed by the data link layer.

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 “tear-off” answer sheet attached to the question paper, following instructions therein. (1 x 10)

X		Y	
3.1	Total Internal Reflection	A.	A simplex protocol
3.2	Cryptography	B.	Stop and wait protocol
3.3	Echo suppressor	C.	Fiber optics
3.4	Codec	D.	Security
3.5	Go back n	E.	Telephone System
3.6	Multiple access protocols	F.	Local loop
3.7	Logical Link Control	G.	Sliding window protocols
3.8	Polling	H.	IEEE 802.3
3.9	Firewall	I.	IEEE 802.4
3.10	Flow control & buffering	J.	Frame Relay
		K.	Pure ALOHA
		L.	IEEE 802.2
		M.	Satellite Networks
		N.	Internetworking
		O.	Transport 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 “tear-off” answer sheet attached to the question paper, following instructions therein. (1 x 10)

A.	Cryptography	B.	HDLC	C.	Modem
D.	Star topology	E.	Analog Signal	F.	Framing
G.	Distributed queue dual bus	H.	CDPD	I.	Routing Algorithm
J.	Congestion	K.	Circuit	L.	SNA
M.	1 MHz	N.	Diffraction grating	O.	CDMA
P.	Traffic shaping	Q.	Crash Recovery	R.	Management Information base

- 4.1 _____ is one of the data link layer design issues.
- 4.2 _____ is IEEE standard 802.6.
- 4.3 _____ is a packet switched digital datagram service.
- 4.4 _____ is that part of the Network Layer software responsible for deciding which output line an incoming packet should be transmitted on.
- 4.5 When too many packets are present in the subnet, performance degrades this situation is called _____.
- 4.6 In WDM, an optical system uses a(n) _____.
- 4.7 _____, avoids time synchronization problem and also the channel allocation problem.
- 4.8 _____ is an approach to congestion management.
- 4.9 _____ is an element of transport protocol.
- 4.10 The collection of all possible objects in a network is given in a data structure called the _____.

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

- 5.**
- a) Explain with the help of a neat labelled diagram the B-ISDN ATM reference Model.
 - b) Explain with the help of a neat labelled diagram the ISO-OSI Model and the function of its various layers.
 - c) What are the different classes of addresses used in IPv4? List their ranges in dotted decimal notation.

(5+5+5)

- 6.**
- a) With respect to transmission media, compare Fiber Optics and Copper Wire.
 - b) Explain the concept of framing with respect to Data Link Layer.
 - c) Briefly explain the High-Level Data Link Control (HDLC) protocols with neat labelled diagrams.

(5+5+5)

- 7.**
- a) Compare the IEEE standards 802.2, 802.3, 802.4, 802.5 and 802.6 briefly.
 - b) Explain the difference between pure ALOHA and slotted ALOHA and draw diagrams for them.
 - c) What are high speed LANs? Describe briefly the various types of High-speed LANs used in computer communication networking.

(5+5+5)

- 8.**
- a) Explain the concept of IP protocols and addresses, subnets and Internet Control Protocols for the network layer in the Internet.
 - b) What are Routing Algorithms? Explain flooding, the optimality principle and shortest path routing.
 - c) What basic functions does a communication satellite perform? Give a good reason why up-link and down-link frequencies are not same. Why are earth dish antenna are generally parabolic in shape?

(5+5+5)

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

- a) GSM
- b) SONET
- c) Novell Netware
- d) Firewalls

(3x5)