B2.4-R4: DATA COMMUNICATION & NETWORK TECHNOLOGIES

अवधि: 03 घंटे **अधिकतम अंक: 100**

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

ओएमआर शीट सं.: **OMR Sheet No.:**						

रोल नं.: **Roll No.:** | | | | | | |

उत्तर-पुस्तिका सं.: **Answer Sheet No.:** | | | | | | |

परीक्षार्थी का नाम: **परीक्षार्थी के हस्ताक्षर**:

Name of Candidate: _____; Signature of candidate: _____

परीक्षार्थियों के लिए निर्देश:	**Instructions for Candidate:**
कृपया प्रश्न-पुस्तिका**,** ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यान पूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** है। **भाग एक** में चार प्रश्न और **भाग दो** में पाँच प्रश्न है।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions**.**
भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो**, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is subjective type and carries 60 Marks.
भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर-पुस्तिका** पर**,** उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने है। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**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**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	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.**
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना एवं अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हाल नहीं छोड़ सकता हैं। ऐसा नही करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his Answer sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात एवं उत्तर देने से पहले उम्मीदवार यह जाँच कर यह सुनिश्चित कर ले कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	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.

जब तक आपसे कहा न जाए तब तक प्रश्न-पुस्तिका न खोलें।

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

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 is not a type of guided media?
A) coaxial cable B) fiber-optic cable
C) twisted-pair cable D) wave guide

1.2 Which layer is responsible for flow control with sliding windows and reliability with sequence numbers and acknowledgments?
A) Transport B) Application
C) Internet D) Network Interface

1.3 Which one of the following is a LAN protocol?
A) HDLC B) PPP
C) Frame relay D) Ethernet

1.4 _____ permits data transfer in both directions, but the data will flow in one direction at a time. It requires only one transmission channel, but the channel must be bidirectional.
A) Simplex B) Half Duplex
C) Full Duplex D) All of the above

1.5 ATM Technology uses the following features
A) Fixed-size cells
B) Connection-oriented service
C) Asynchronous multiplexing
D) All of the above

1.6 Routers are used at which layer in TCP/IP protocol suite?
A) Application B) Transport
C) Network D) Physical

1.7 In a token ring network the transmission speed is 10^7 bps and the propagation speed is 200 meters/micro second. The 1-bit delay in this network is equivalent to:
A) 500 meters of cable. B) 200 meters of cable.
C) 20 meters of cable. D) 50 meters of cable.

1.8 The primary goal of the _____ protocol is to provide a private channel between communicating application, which ensures privacy of data authentication of the partners, and integrity.
A) SSL B) ESP
C) TSL D) PSL

1.9 Commonly used multiplexing mode for 3G networks is
A) TDMA B) FDMA
C) TDD D) FDD

1.10 Which of the following functions does UDP perform?
A) Host-to-host communication
B) Process-to-process communication
C) End-to-end reliable data delivery
D) Interface-to-interface communication.

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 At low frequencies, radio waves pass through obstructions well, but the power falls of with distance from the source roughly as 1/r in air.

2.2 Modem is a device which allows a computer to talk with another computer via telephone line.

2.3 CSMA/CD is suitable for wired media but not for wireless transmission.

2.4 Data transfer rate is the speed with which data is moved from one place on the network to another.

2.5 A star topology is a LAN configuration in which all nodes are connected in a closed loop.

2.6 Network packets contain instructions regarding the route they should travel to reach their destination.

2.7 DHCP (dynamic host configuration protocol) provides IP address to the client.

2.8 The use of variable length subnet masks is permitted in classless routing protocols.

2.9 TLS is more secure than SSL.

2.10 Frame relay technology requires the most bandwidth to handle a given VoIP session.

ROUGH WORK SPACE:

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	It is a set of protocols which sit on top of the Internet Protocol (IP) layer	**A.**	Link State Routing
3.2	Pretty Good Privacy (PGP) provides	**B.**	100
3.3	Mobile Adhoc Networks	**C.**	Network layer
3.4	The data link layer divides the stream of bits received from the network layer into manageable data units called	**D.**	channel (circuit)
3.5	Dynamic Routing Protocol	**E.**	cryptographic privacy
3.6	Fast Ethernet is capable of moving information at the rate of up to _____ Mbps.	**F.**	Dynamic Host Control Protocol
3.7	X.25 operates in the _____.	**G.**	Data link layer
3.8	Circuit switching is a method of implementing a telecommunications network in which two network nodes establish a dedicated communications _____ through the network	**H.**	MANET
3.9	Which layer provides compression and translation in OSI?	**I.**	1000
3.10	DHCP	**J.**	frames
		K.	IPsec
		L.	Presentation layer
		M.	packet

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.	maximized	**B.**	terminator	**C.**	UTP
D.	virtual	**E.**	minimized	**F.**	Connection oriented
G.	Asynchronous	**H.**	unreliable	**I.**	The primary ring
J.	World Wide Web	**K.**	Bit rate	**L.**	CSMA/CD
M.	Adaptive				

4.1 In a digital data transmission baud rate is equal to _____.

4.2 Start and stop bits are required in _____ frequencies.

4.3 STP and _____ can be used for both Analog and digital data transmission.

4.4 ATM is a virtual _____ technology.

4.5 Throughput of aloha is _____ when all frames are of same size.

4.6 In FDDI, data normally travel on _____.

4.7 In BUS topology, at each end of the bus is a _____, which absorbs any signal, removing it from the bus.

4.8 Dynamic routing is also called _____ routing.

4.9 UDP is said to be an _____ transport protocol but it uses IP services which provides best effort delivery mechanism.

4.10 HTTP is the foundation of data communication for the _____.

ROUGH WORK SPACE:

PART TWO
(Answer any FOUR questions)

5.

a) Connection oriented and connection less are transport layer services. What are the differences between them? Also, compare it with circuit switching and packet switching.

b) Multiplexing is a way to transmit multiple signal over one channel. Explain with suitable example: Time Division Multiplexing (TDM) and Frequency Division Multiplexing (FDM).

(8+7)

6.

a) OSI is reference model for communication protocol development. Elaborate in detail what are the layers of Open System Interconnection (OSI) model? List the responsibilities of each layer.

b) Sliding window protocol is used for congestion control. Explain 1-bit sliding window protocol.

c) Differentiate LAN, WAN, MAN.

(7+3+5)

7.

a) Define the following addresses with reference to TCP/IP protocol suite.
   i) Physical address
   ii) Logical Address
   iii) Port address

b) Routing is the process of selecting best paths in a network. What is static routing? How does it differ from dynamic routing?

c) What are the advantages of Sliding Window protocol? Briefly explain Go-Back-N protocol with example.

(6+4+5)

8.

a) Differentiate error control and flow control. How they are useful in communication.

b) Are the token rings same as star topology? What is the big difference between Ethernet and token ring?

c) Give key differences between encryption and digital signature.

(5+5+5)

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

a) CSMA/CA

b) Synchronous and Asynchronous Transmission

c) Link State Routing

d) Cellular Radio

e) Hyper Text Transfer Protocol (HTTP)

(3x5)

ROUGH WORK SPACE:

ROUGH WORK SPACE: