B2.4-R4: DATA COMMUNICATION & NETWORK TECHNOLOGIES

«srlno»

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 कर 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 अथवा 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 or 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 The _____ address identifies a process on a host.
A) specific
B) port
C) IP
D) physical

1.2 When a host on network A sends a message to a host on network B, which address does the router look at?
A) logical
B) physical
C) port
D) none of the above

1.3 If the maximum amplitude of a sine wave is 2 V, the minimum amplitude is _____ V.
A) 2
B) 1
C) -2
D) between -2 and 2

1.4 A periodic signal completes one cycle in 0.001 s. What is the frequency?
A) 1 Hz
B) 100 Hz
C) 1 KHz
D) 1MHz

1.5 If the frequency spectrum of a signal has a bandwidth of 500 Hz with the highest frequency at 600 Hz, what should be the sampling rate, according to the Nyquist theorem?
A) 200 samples/s
B) 500 samples/s
C) 1000 samples/s
D) 1200 samples/s

1.6 When the angle of incidence is _____ the critical angle, the light beam bends along the interface.
A) less than
B) equal to
C) more than
D) none of the above

1.7 If the Hamming distance between a dataword and the corresponding codeword is three, there are _____ bits in error.
A) 5
B) 4
C) 3
D) none of the above

1.8 An IPv6 address can have up to _____ colons.
A) 8
B) 7
C) 4
D) none of the above

1.9 Which of the following is true about ICMP messages?
A) An ICMP error message may be generated for an ICMP error message.
B) An ICMP error message may be generated only for the first fragment.
C) An ICMP error message may be generated for a multicast datagram.
D) None is true

1.10 An organization is granted a block; one address is 2.2.2.64/20. The organization needs 10 subnets. What is the subnet prefix length?
A) /20
B) /24
C) /25
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 The minimum size of a TCP / IPv4 packet which you can send is 41 bytes.

2.2 In public key encryption, both the encryption algorithm and encryption key is known to everyone but the decryption key is known only to the receiver.

2.3 split horizons is when Information about a route is not sent back in the direction from which the original update came.

2.4 In 1-persistent CSMA, a station that has a frame to send, senses the line. If the line is idle, it sends immediately. If the line is not idle, it waits a random amount of time and then senses the line again.

2.5 SSL provides privacy, integrity, and authentication in e-mail.

2.6 A manager is a host that runs the SNMP Client process.

2.7 Infrared waves are more secure as they cannot propagate through opaque objects such as walls.

2.8 Peer-to-peer (P2P) is a centralized communications model in which each party has the same capabilities and either party can initiate a communication session.

2.9 GSM is a digital cellular phone system using both FDMA and TDMA.

2.10 A Stop and wait protocol uses a sliding window of size 1.

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	Stop Network Loops	**A.**	Inverse domain
3.2	Protocol using hop count as metric	**B.**	SMI
3.3	The stations share the bandwidth of the channel in time.	**C.**	AMPS
3.4	Maps Hardware address to IP Address	**D.**	AH
3.5	Variable declaration in Network Management	**E.**	Route Poisoning
3.6	Layer uses both header and trailer	**F.**	TDMA
3.7	map an address to a name	**G.**	RIP
3.8	first-generation cellular phone system	**H.**	Network
3.9	Does Authentication at the IP level	**I.**	MIB
3.10	Routed protocol	**J.**	RARP
		K.	DLL
		L.	IP
		M.	GSM

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.	Analog to Digital	**B.**	Tunnel	**C.**	flag
D.	Slow start	**E.**	Omnidirectional	**F.**	Flooding
G.	Circuit Switching	**H.**	Microwaves	**I.**	LCP
J.	TCP	**K.**	Analog to Analog	**L.**	Radio waves
M.	Transport				

4.1 AM and FM are examples of _____ conversion.
4.2 HTTP uses the services of _____ on well-known port 80.
4.3 In the _____ mode, IPSec protects information delivered from the transport layer to the network layer.
4.4 _____ broadcasts packets, but creates loops in the systems.
4.5 Radio waves are _____.
4.6 Bit stuffing means adding an extra 0 to the data section of the frame when there is a sequence of bits with the same pattern as the _____.
4.7 In the _____ algorithm of TCP, the size of the congestion window increases exponentially until it reaches a threshold.
4.8 In PPP, the _____ is responsible for establishing, maintaining, configuring, and terminating links.
4.9 _____ are used for cellular phone, satellite, and wireless LAN communications.
4.10 In _____ the resources need to be reserved during the setup phase; the resources remain dedicated for the entire duration of data transfer phase until the teardown phase.

ROUGH WORK SPACE:

PART TWO
(Answer any FOUR questions)

5.

a) Explain CSMA and CSMA/CA Protocols in detail.

b) Explain why ARP protocol is required along with its working?

(10+5)

6.

a) Explain Distance Vector Routing protocol and how is it different from Link State Protocol?

b) Highlight the differences between IPv4 and IPv6

c) Identify the Network and Host Id of the following:

i) 192.16.23.4
ii) 133.38.21.5
iii) 87.126.99.100

(8+4+3)

7.

a) Explain the concept of Sliding window protocol along with go-back-n and selective repeat Sliding window protocols?

b) Explain the concept of Synchronous and Asynchronous Transmission

c) Why is Modulation required?

(9+4+2)

8.

a) Explain why is a minimum frame size required on Ethernet? What changes were made in Fast Ethernet and Gigabit Ethernet regarding the same?

b) If the data frame is 1101011011, and generator is 10011, what is the transmitted frame using CRC Technique?

(9+6)

9.

a) Distinguish between CDMA, FDMA and TDMA.

b) Write Short notes on:

i) NFS
ii) VLAN
iii) VSAT
iv) GSM
v) SNMP

(5+10)

*****

ROUGH WORK SPACE:

ROUGH WORK SPACE:

ROUGH WORK SPACE: