A9/B2.4-R4 : DATA COMMUNICATION AND 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 Candidates :** _____

परीक्षार्थियों के लिए निर्देश :	**Instructions for Candidate :**
कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक 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 सकते हैं।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं।	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 का 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 हैं। **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 पश्चात् 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** to the Invigilator.
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना एवं अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं 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/her 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 पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार यह जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before starting to answer 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=10)**

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

(A) Network

(B) Transport

(C) Application

(D) Host to Network

1.2 Which of the following medium access technique is most suitable for wireless networks ?

(A) CSMA/CD

(B) Slotted Aloha

(C) CSMA/CA

(D) p-persistent

1.3 In IPv4 address, if all the 32-bits are set to 1's it is known as _____ address.

(A) Direct Broadcast

(B) Limited Broadcast

(C) Multicast

(D) Network

1.4 Which of the following modulation is used by QAM (Quadrature Amplitude Modulation) ?

(A) Digital to Digital

(B) Analog to Digital

(C) Digital to Analog

(D) None of the above

1.5 Which layer of OSI reference model does the data compression ?

(A) Session

(B) Application

(C) Network

(D) Presentation

1.6 Which of the following is a layer-3 device ?

(A) Bridge

(B) Router

(C) Repeater

(D) Hub

1.7 Protocol which is used to assign the IP address automatically is known as _____.

(A) Address Resolution Protocol (ARP)

(B) Reverse Address Resolution Protocol (RARP)

(C) Dynamic Host Configuration Protocol (DHCP)

(D) None of the above

1.8 In the field of Data Communication, Data rate depends on factors like :

(A) The bandwidth available

(B) Level of the signal used

(C) Quality of the channel

(D) All of the above

1.9 Which of the following is an example of inter domain routing protocol ?

(A) Distance Vector Routing

(B) Link State Routing

(C) Border Gateway Protocol

(D) Flooding

1.10 When two or more devices are connected in the same network then which layer is responsible for delivery of data ?

(A) Network layer

(B) Data Link layer

(C) Transport

(D) Presentation

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=10)

2.1 Half Duplex communication permits data transfer in both the direction simultaneously.

2.2 In ATM the size of cell is of 53 bytes.

2.3 Line coding is a process that converts digital data in analog signal.

2.4 IPv6 addressing scheme supports broadcasting.

2.5 Routing Information Protocol (RIP) uses a distance vector routing technique.

2.6 A Permanent Virtual Circuit (PVC) is a software-defined logical connection in a network such as a frame relay network.

2.7 A DNS client is also known as DNS resolver.

2.8 Communication using Bluetooth is an example of AdHoc network.

2.9 Default port number for HTTPS is 80.

2.10 FTP uses TCP as an underlying protocol.

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=10)**

X		Y	
3.1	Hop to Hop Delivery	**A.**	UTP Cable
3.2	128-bit address	**B.**	Peak Amplitude
3.3	Device which will regenerate the signal	**C.**	Data Link Layer
3.4	Characteristic of Sine Wave	**D.**	TFTP
3.5	A protocol to transfer file	**E.**	Telnet
3.6	Preventing Cross-talk	**F.**	10.0.0.1
3.7	Private IPv4 Address	**G.**	Repeater
3.8	Application Listening on port number 23 of TCP	**H.**	Shielded Twisted Pair Cable
3.9	Forward DNS lookup	**I.**	127.0.0.1
3.10	Reverse DNS Lookup	**J.**	Name to Address
		K.	Address to Name
		L.	IPv6
		M.	IPv4

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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=10)**

A.	48	**B.**	Physical	**C.**	Analog to Digital
D.	UDP	**E.**	DES	**F.**	Digital to Analog
G.	IDEA	**H.**	Biphase	**I.**	SNMP
J.	Hamming Code	**K.**	byte oriented	**L.**	Inversely proportional
M.	Hamming Distance				

4.1 The transport layer protocol _____ is connection less.

4.2 Physical address is of _____ bits which are represented in hexadecimal form.

4.3 _____ is a client server protocol which is used to manage the network remotely.

4.4 PCM (Pulse Code Modulation) is an example of _____ modulation.

4.5 The _____ is a symmetric key cryptography algorithm.

4.6 Differential Manchester Encoding is an example of _____ encoding.

4.7 HDLC is an example of _____ data link protocol.

4.8 Frequency and period of the analog signal is _____ to each other.

4.9 _____ is a method of correcting a single bit error in data which is transferred on channel.

4.10 The photonic layer of SONET is similar to the _____ layer of OSI model.

PART TWO

(Answer any FOUR questions.)

5. (a) Differentiate between flow control and congestion control.

(b) Describe OSI reference model in brief.

(c) Explain Network Address Translation in detail. What is the significance of using NAT in IPv4 addressing scheme ? **(3+5+7=15)**

6. (a) What do you mean by topology? Explain various topologies in brief.

(b) Differentiate Circuit Switching and Packet Switching.

(c) What do you mean by transmission impairment ? Explain each of them in brief.

(d) If the subnet mask of the network is 255.255.240.0, how many hosts can be created in each network ? **(5+3+5+2=15)**

7. (a) Define : Cryptography. Explain the components of cryptography in detail.

(b) Explain Pure ALOHA protocol in detail. What is the disadvantage of using Pure ALOHA protocol ? Differentiate between Pure ALOHA and Slotted ALOHA protocol.

(c) What do you mean by Error Control ? Explain Go-back N protocol in detail. **(4+7+4=15)**

8. (a) Write a short note on DNS (Domain Name System).

(b) List down the fields of IPv4 header related to fragmentation of packet. Explain each of them in detail.

(c) Explain Distance Vector Routing algorithm by taking a suitable example. List down the problem of Distance Vector Routing protocol. **(5+3+7=15)**

9. (a) Write a short note on FDDI (Fiber Distributed Data Interface).

(b) What is VPN (Virtual Private Network) ? What is the relationship between VPN and firewall ?

(c) What do you mean by multiplexing? List down the advantages of multiplexing. Explain FDM (Frequency Division Multiplexing) in brief. **(5+5+5=15)**

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