

**A9-R4/B2.4-R4 : DATA COMMUNICATION AND NETWORK
TECHNOLOGIES**

अवधि : 03 घंटे
DURATION : 03 Hours

अधिकतम अंक : 100
MAXIMUM MARKS : 100

ओएमआर शीट सं. :					
OMR Sheet No. :					

रोल नं. :

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Roll No. :

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उत्तर-पुस्तिका सं. :

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Answer Sheet No. :

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परीक्षार्थी का नाम : _____;Signature of Candidate : _____

Name of Candidate : _____

परीक्षार्थियों के लिए निर्देश :

Instructions for Candidate :

<p>कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक पढ़ें।</p>	<p>Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.</p>
<p>प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकता है।</p>	<p>Question Paper is in English language. Candidate can answer in English language only.</p>
<p>इस मॉड्यूल/पेपर के दो भाग हैं। भाग एक में चार प्रश्न और भाग दो में पाँच प्रश्न हैं।</p>	<p>There are TWO PARTS in this Module/Paper. PART ONE contains FOUR questions and PART TWO contains FIVE questions.</p>
<p>भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 हैं तथा भाग दो "व्यक्तिपरक" प्रकार का है और इसके कुल अंक 60 हैं।</p>	<p>PART ONE is Objective type and carries 40 Marks. PART TWO is Subjective type and carries 60 Marks.</p>
<p>भाग एक के उत्तर, ओएमआर उत्तर-पुस्तिका पर ही दिये जाने हैं। भाग दो की उत्तर-पुस्तिका में भाग एक के उत्तर नहीं दिये जाने चाहिए।</p>	<p>PART ONE is to be answered in the OMR ANSWER SHEET only. PART ONE is NOT to be answered in the answer book for PART TWO.</p>
<p>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।</p>	<p>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.</p>
<p>परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और 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।</p>	<p>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.</p>
<p>प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।</p>	<p>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.</p>

**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 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

1.2 Analog-to-analog conversion is needed if the available bandwidth is _____.

- (A) band-pass
- (B) low-pass
- (C) either (A) or (B)
- (D) neither (A) nor (B)

1.3 In IPv6, the _____ field in the base header and the sender IP address combine to indicate a unique path identifier for a specific flow of data.

- (A) flow label
- (B) next header
- (C) hop limit
- (D) destination IP address

1.4 Which of the following is an application layer service ?

- (A) File transfer and access
- (B) Mail service
- (C) Remote login
- (D) All the above

1.5 The inner core of an optical fiber is _____ in composition.

- (A) copper
- (B) glass or plastic
- (C) bimetallic
- (D) liquid

1.6 An SNMP agent can send _____ messages.

- (A) GetRequest
- (B) SetRequest
- (C) Trap
- (D) None of the above

1.7 Gigabit Ethernet has a data rate of _____ Mbps.

- (A) 10,000
- (B) 1,000
- (C) 100
- (D) 10

1.8 In cyclic redundancy checking, the divisor is _____ the CRC.

- (A) one bit less than
- (B) one bit more than
- (C) the same size as
- (D) none of the above

1.9 For the control connection, FTP uses the character set.

- (A) Regular ASCII
- (B) EBCDIC
- (C) NVT ASCII
- (D) None of the above

1.10 A linear SONET network can be _____.

- (A) multipoint
- (B) point-to-point
- (C) either (A) or (B)
- (D) neither (A) nor (B)

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 In TCP, one end can stop sending data while still receiving data. This is called a half-open.

2.2 In the sending computer, UDP receives a data unit from the application layer.

2.3 The WWW is a repository of information linked together from points all over the world.

2.4 Quadrature Amplitude Modulation (QAM) is a combination of ASK and FSK.

2.5 The Session layer establishes, maintains, and synchronizes the interactions between communicating devices.

2.6 TCP is a connection-oriented protocol.

2.7 In a circuit switched network, two types of addressing are involved : global and local.

2.8 Flow control refers to a set of procedures used to restrict the amount of data that the sender can send before waiting for acknowledgment.

2.9 HTTP uses the services of TCP on well-known port 80.

2.10 Mail services are available to network users through the Transport 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 "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

	X		Y
3.1	TCP	A.	Low-pass Channel
3.2	Baseband transmission	B.	Mapping of an address to a name
3.3	Error detection and correction	C.	Operates in tunnel mode
3.4	IPSec	D.	HTML
3.5	ARP	E.	Adaptive Routing
3.6	Inverse domain	F.	Circuit Switching
3.7	Sampling	G.	Transport Layer Protocol
3.8	Dynamic routing	H.	Pulse Amplitude Modulation
3.9	Language for creating web pages	I.	Error Control
3.10	Switching technique at physical layer	J.	FTP
		K.	Address Resolution Protocol
		L.	Pulse Code Modulation
		M.	WWW

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.	Transition, no transition	B.	Datagram Switching	C.	Circuit Switching
D.	Codewords	E.	Decryption	F.	SMTP
G.	Substitution	H.	125	I.	TCP/IP
J.	CSMA/CD	K.	Band-pass channel	L.	Generator
M.	2				

- 4.1 In _____ there are no set-up or teardown phases.
- 4.2 We add r redundant bits to each block to make the length $n = k + r$. The resulting n -bit blocks are called _____.
- 4.3 In SONET each frame lasts _____ microseconds.
- 4.4 _____ augments the CSMA algorithm to detect collision.
- 4.5 The channel used in Broadband transmission is called _____.
- 4.6 In Differential Manchester encoding if the next bit is 0 there is _____ and if the next bit is 1 there is _____.
- 4.7 The Hamming distance between 100 and 001 is _____.
- 4.8 The divisor in a cyclic code is normally called the _____.
- 4.9 _____ algorithm transforms ciphertext to plaintext.
- 4.10 A _____ cipher replaces one character with another character.

PART TWO

(Answer any FOUR questions)

5. (a) Explain the TCP/IP model in brief.
(b) Differentiate between Pure aloha and Slotted aloha.
(c) What is Spread Spectrum ? List all the types of spread spectrum. Explain difference between frequency hopping spread spectrum and direct sequence spread spectrum technique. (5+3+7)
6. (a) Define the following : switches, hub, routers, gateway, repeater.
(b) Differentiate between Dynamic routing and Static routing.
(c) Explain GSM frame format with appropriate diagram. (5+3+7)
7. (a) Differentiate between Synchronous and Asynchronous transmission.
(b) What is Simple Mail Transfer Protocol (SMTP) ? Explain along with a diagram.
(c) What do you mean by Transmission impairments ? List and explain all of them in brief.
(d) Define the following :
(i) Domain Name System
(ii) Network Address Translation (3+5+5+2)

8. (a) Differentiate between Connectionless and Connection Oriented services.
(b) Explain Simple Network Management Protocol (SNMP).
(c) What is Multiplexing ? List the types of multiplexing techniques and explain any one. (5+5+5)
9. (a) Explain Baseband and Broadband Transmission with the help of an example.
(b) What is ICMP ? What is its purpose ?
(c) What are Optical Fiber cables ? Mention their advantages and disadvantages.
(d) Write a short note on FDDI (Fiber Distributed Data Interface). (5+2+5+3)

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SPACE FOR ROUGH WORK

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