

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Data Communication and Computer Networks	Semester: IV
Program: B.Tech. (CSE, IBM All Branches)	Time 03 hrs.
Course Code: CSEG 2009	Max. Marks: 100

Instructions:

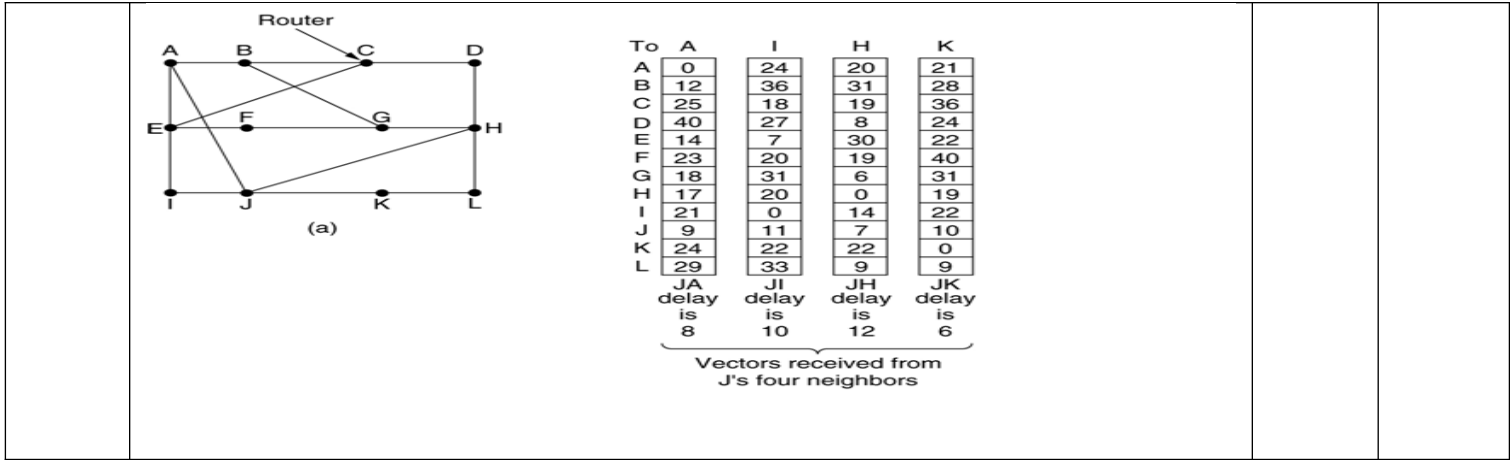
1. Section A - 20 marks (Attempt All 5 Questions in this Section. Each question carries 4 marks)
2. Section B - 40 marks (Attempt All 4 questions. Each question carries 10 marks)
3. Section C - 40 marks (Attempt All 2 question. Each question carries 10 marks)

SECTION A

S. No.	Question	Marks	CO
Q 1	Enlist the scenarios where unguided communication media are preferred over guided media. Explain TWO advantages and TWO disadvantages of coaxial cable for communication.	2+2	CO1
Q 2	Differentiate the two protocols at transport layer TCP and UDP on various parameters.	4	CO5
Q 3	Compare and contrast various switching techniques?	4	CO2
Q 4	Describe the significance of error detection and error correction mechanisms employed at data link layer. Enlist different mechanisms under both categories.	1+1+2	CO3
Q 5	As you are an administrator of a network company, you are allotted a network address 192.10.1.0. There are 3 Departments Sales with 110 users, Purchase with 55 users and Management with 12 users. You need to create subnets for all these departments. Allocate valid IP addresses to all users.	4	CO4

SECTION B

Q 6	Explain IPV-4 header format with suitable diagram, explicitly explaining all the fields and their relevance.	10	CO4
Q 7	a) Why routing is important in communication and which layer is responsible for routing in OSI model? With a suitable example explain Link State Routing algorithm. <p style="text-align: center;">---OR---</p> b) Discuss the disadvantages of Distance Vector Routing algorithm. Consider the given topology (Fig. a) and the vectors received by router J from its neighbors. Based on this information calculate the new routing table of J. Show the detailed calculations.	4+6	CO4



Q 8	Compare and contrast three IEEE standards 802.3, 802.4 and 802.5.	10	CO3
Q 9	a) What do you understand with Domain Name System (DNS)? b) Name the different types of network topologies and brief their advantages? c) What is Piggybacking? For what purpose it is used and how is it helpful?	3+4+3	CO6 CO1 CO3

SECTION-C

Q 10	<p>a) Write down the FOUR functions of Application layer. b) Explain steps involved during connection establishment and connection termination in detail in TCP connection management with suitable diagram.</p> <p style="text-align: center;">-----OR-----</p> <p>a) Explain FTP with suitable diagram. b) How window management takes place in TCP through which flow control is achieved. Explain with the help of following scenario:</p> <p><i>A TCP connection is using a window size of 1000 B and the previous acknowledgment number was 22,001. It receives a segment with acknowledgment number 24,001. Draw a diagram to show the situation of the window after and before the acknowledgment is received. If the window size is changed to 11000 B and 9000 B separately then what will be the situation.</i></p> <p><i>(you may take different scenario on your own but will lose 2 marks)</i></p>	5+15	CO5, CO6
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Q 11	Write short notes on the followings: a) HTTP b) OSPF vs BGP c) TDM vs FDM d) SNMP	20	CO6, CO3, CO4
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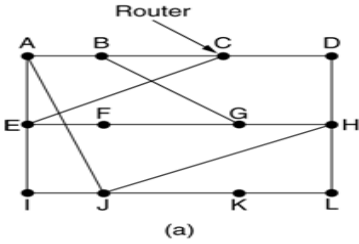
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SECTION A

S. No.		Marks	CO
Q 1	We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need?	4	CO1
Q 2	Give the format for UDP datagram and explain each field with function.	4	CO5
Q 3	Draw OSI layer architecture of computer networks. Place following concepts into correct layers of ISO-OSI reference model and justify your answer: a) Forming a modem connection b) Responsibility of delivery between adjacent nodes c) Reliable process to process data transportation	4	CO2
Q 4	To share the same communication media among various users is termed as channel allocation problem. Which layer in the architecture of networks is responsible for this function? Classify various channel allocation schemes with brief of each of them.	4	CO3
Q 5	What is the problem of synchronization in communication? Draw Manchester and Differential Manchester Encoding of the bit stream 110100011001	4	CO3

SECTION B

Q 6	What is multiplexing? Explain its types and advantages in communication.	10	CO5
Q 7	Explain inter-networking connecting devices in reference to OSI layers. ---OR--- Explains the drawbacks of distance vector routing scheme. Consider the given topology (Fig. a) and the vectors received by router J from its neighbors. Based on this information calculate the new routing table of J. Show the detailed calculations.	10	CO4



To	A	I	H	K
A	0	24	20	21
B	12	36	31	28
C	25	18	19	36
D	40	27	8	24
E	14	7	30	22
F	23	20	19	40
G	18	31	6	31
H	17	20	0	19
I	21	0	14	22
J	9	11	7	10
K	24	22	22	0
L	29	33	9	9

JA delay is 8 JI delay is 10 JH delay is 12 JK delay is 6

Vectors received from J's four neighbors

Q 8	What is the problem in Go-Back-N protocol? How it can be solved, justify your answer.	10	CO3
Q 9	What is classful addressing? A Class 'C' network address 205.16.37.0 has been granted to an organization. This organization requires 6 subnetworks within it. Design the subnets and give the range of each subnetwork addresses. All calculations are required to be shown in detail.	2+8	CO4

SECTION-C

Q 10	<p>a) Draw and explain HDLC frame format and all fields therein.</p> <p>b) Explain TCP header format with suitable diagram. Write the functions/purpose of each field therein.</p> <p style="text-align: center;">----OR----</p> <p>a) Write a brief note on checksum and Hamming Code in reference to error correction and detection.</p> <p>b) How window management takes place in TCP through which flow control is achieved. Explain with the help of following scenario:</p> <p><i>A TCP connection is using a window size of 1000 B and the previous acknowledgment number was 22,001. It receives a segment with acknowledgment number 24,001. Draw a diagram to show the situation of the window after and before the acknowledgment is received. If the window size is changed to 11000 B and 9000 B separately then what will be the situation.</i></p> <p><i>(you may take different scenario on your own but will lose 2 marks)</i></p>	8+12	CO3, CO5
	Q 11		