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UNIVERSITY OF PETROLEUM & ENERGY STUDIES

End Semester Examination, May 2018

Program: M.Tech. (CSE)

Subject (Course): Data Communication & Computer Networks

Course Code : CSEG7004

No. of page/s: 01

Semester – II

Max. Marks : 100

Duration : 3 Hrs

Section A

(5 X 4 = 20)

Answer ALL questions. Each question carries 4 marks.

1. Define Computer Networks? Classify the computer networks into various categories based on at least 3 parameters. [CO1]
2. Write Short notes on [CO2]
 - a) LEO, MEO and GEO satellite communication
 - b) Multiplexing
3. What are various error control mechanisms applied by Data Link Layer? If data stream **1101100001011** has to be transmitted over the communication medium. Calculate the CRC OR Hamming Code for this bit stream. If you are calculating CRC, use x^4+x^2+x+1 as CRC generator polynomial. [CO3]
4. An organization is granted the network address **211.17.180.0**. The network administrator wants to create 30 subnets.
 - a. What is the subnet mask value?
 - b. What is the first and last machine addresses in the first and last subnets?
 - c. Give diagrammatical representation of the network. [CO4]
5. When there is already network layer to carry the packets through the communication subnet, what is the need of transport layer? Justify your answer. [CO5]

Section B

(4 X 10 = 40)

6. What are various connecting devices used to connect different networks? Differentiate between Switches and Bridges. [CO1]
7. What is the concept of minimum frame size in CSMA/CD networks, explain Consider a CSMA/CD network running at **100Mbps** over a **3.5 Km** cable with no repeater. The signal speed is **3×10^8 m/sec**. Consider another similar network running at **1 Gbps** over a **4 Km** cable with the signal speed of **2×10^5 Km/sec**. Which of these two networks has the larger value of their minimum frame sizes?

OR

What is the concept of minimum frame size in CSMA/CD networks, explain. Why CSMA/CD networks are not suitable to build real time systems? How this limitation has been come over in Token Bus (IEEE 802.4) networks, explain in detail.

[CO3]

8. Discuss the *flow control* function of data link layer is addressed by using a sliding window protocol? Briefly discuss two ARQs with their pros and cons. [CO3]

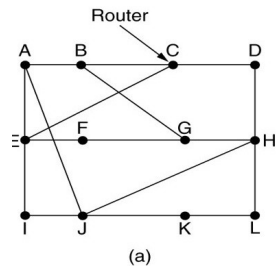
9. What are various switching techniques? Compare and contrast them with one another by giving examples. [CO2]

Section C

(2 X 20 = 40)

11. (a) What are the characteristics of a good routing algorithm? Discuss. [CO4]

(b) Router J's neighbors has just shared their routing tables with it in the following topology and based on that information, router J wants to update its routing table. Using Distance Vector routing algorithm, show the updated routing table of router J. Show all detailed calculations of intermediate steps.



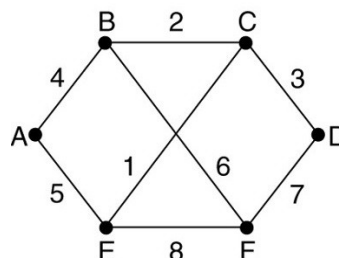
To	A	I	H	K
A	0	24	20	21
B	12	36	31	28
C	25	18	19	36
D	40	27	8	24
E	14	7	30	22
F	23	20	19	40
G	18	31	6	31
H	17	20	0	19
I	21	0	14	22
J	9	11	7	10
K	24	22	22	0
L	29	33	9	9

JA delay is 8	JI delay is 10	JH delay is 12	JK delay is 6
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Vectors received from J's four neighbors

OR

(b) Discuss the various steps involved in Link State Routing algorithm in detail. Build the LS packets for the following topology, assuming the delays written on the corresponding links.



12. Write short notes on

[CO5]

- File Transfer Protocol (FTP)
- Domain Name System (DNS)
- Simple Mail Transfer Protocol (SMTP)
- User Datagram Protocol (UDP)