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BTECH
(SEM VI) THEORY EXAMINATION 2023-24
DATA COMMUNICATION NETWORKS

TIME: 3 HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

Q no.	Question	Marks	CO
a.	What are some common applications of computer networks?.	02	1
b.	What is the role of protocols and standards in network communication?	02	1
c.	What is framing in the context of the data link layer?	02	2
d.	What are the main features of the Point-to-Point Protocol (PPP)?	02	2
e.	Compare the data rates for Standard Ethernet, Fast Ethernet, Gigabit Ethernet, and Ten- Gigabit Ethernet.	02	3
f.	Explain the key features and characteristics of Standard Ethernet.	02	3
g.	Change the following IPv4 addresses from dotted- decimal notation to binary notation. (i) 111.56.45.78 (ii) 221.34.7.82	02	4
h.	Discuss the main differences between IPv4 and IPv6 protocols.	02	4
i.	How is HTTP related to WWW?	02	5
j.	Write short note on UDP?	02	5

SECTION B

2. Attempt any three of the following: 3 x 10 = 30

a.	What are the similarities and differences between OSI and TCP/IP models?	10	1
b.	What are the advantages and disadvantages of using fiber optic cables?	10	2
c.	Provide an overview of the IEEE 802.11 standard for wireless LANs. What are its different versions, and how do they improve upon each other?	10	3
d.	A router inside an organization receives the same packet with a destination address 190.240.34.95. If the subnet mask is \19. Find the subnet address.	10	4
e.	Describe cryptography. Explain Substitutional and transposition technique.	10	5

SECTION C

3. Attempt any one part of the following: 1 x 10 = 10

a.	Write short note on 1)Line Coding 2)Switching Techniques 3)IEEE Standards.	10	1
b.	Differentiate between Circuit switching and Packet switching with suitable diagram.	10	1

4. Attempt any one part of the following: 1 x 10 = 10

a.	What are the primary differences between guided and unguided transmission media?	10	2
b.	Compare and contrast HDLC and PPP in terms of their features, functionalities, and suitability for different networking environments.	10	2



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5. Attempt any one part of the following: 1 x 10 = 10

a.	Discuss the concept of Quality of Service (QoS) in IEEE 802.11 networks. How is QoS implemented, and what benefits does it provide?	10	3
b.	How do we say collision detection is analog process? Why do we prefer CSMA over ALOHA? Prove that maximum efficiency of ALOHA is 1/e	10	3

6. Attempt any one part of the following: 1 x 10 = 10

a.	Why do we use subnet mask? Perform the subnetting of the following: IP address 160.111.x.x; Original subnet mask 255.255.0.0; Amount of subnets 6.	10	4
b.	What are the differences between distance vector and link state routing protocols? Explain	10	4

7. Attempt any one part of the following: 1 x 10 = 10

a.	Write short notes on: a) UDP b) TCP c) SCTP	10	5
b.	Explain how does e-mail reaches to destination. Explain in brief SMTP emphasizing the role and function of User Agent (UA) and Mail Transfer Agent(MTA).	10	5

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