PAPER ID-420526

Subject Code: KEC063

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2021-22
DATA COMMUNICATION NETWORKS

Time: 3 Hours ***Total Marks: 100***

Notes:

- *Attempt all Sections and Assume any missing data.*
- *Appropriate marks are allotted to each question, answer accordingly.*

SECTION-A	Attempt **All** of the following Questions in brief	Marks**(10X2=20)**	**CO**
Q1(a)	Identify the five components of a data communication system.		1
Q1(b)	Why are protocols needed?		1
Q1(c)	What is the purpose of cladding in an optical fiber?		2
Q1(d)	Define framing and the reason for its need.		2
Q1(e)	Do we need a multiple access protocol when we use the local loop of the telephone company to access the Internet? Why?		3
Q1(f)	Compare the data rates for Standard Ethernet, Fast Ethernet, Gigabit Ethernet, and Ten- Gigabit Ethernet.		3
Q1(g)	Change the following IPv4 addresses from dotted- decimal notation to binary notation. (i) 111.56.45.78 (ii) 221.34.7.82		4
Q1(h)	List three transition strategies to move from IPv4 to IPv6.		4
Q1(i)	What is the maximum size of the process data that can be encapsulated in a UDP datagram?		5
Q1(j)	How is HTTP related to WWW?		5

SECTION-B	Attempt **ANY THREE** of the following Questions	Marks**(3X10=30)**	**CO**
Q2(a)	How does information get passed from one layer to the next in the Internet model? A system is using NRZ-I to transfer 10-Mbps data. What are the average signal rate and minimum bandwidth?		1
Q2(b)	(i) What is the position of the transmission media in the OSI or the Internet model? (ii) Define piggybacking and its usefulness.		2
Q2(c)	Describe the working principle and architecture of Bluetooth 802.11 standard.		3
Q2(d)	Give a detailed account on Classful and Classless Addressing in IPv4 protocol. Also, define Address depletion issue.		4
Q2(e)	Describe the working of Asymmetric and Symmetric Key Cryptography using suitable diagrams.		5

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q3(a)	Illustrate the fundamental characteristics of data communication system along with various maturity levels of internet standards.		1
Q3(b)	Categorize the four basic topologies in term of line configuration and explain it.		1

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	**CO**
Q4(a)	Explain the working of point-to-point protocol. Discuss frame format for point-to-point protocol.		2
Q4(b)	Design two simple algorithms for bit-stuffing. The first adds bits at the sender; the second removes bits at the receiver.		2

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SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	CO
Q5(a)	Discuss Ethernet in brief. Also explain binary back-off algorithm.		3
Q5(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.		3

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	CO
Q6(a)	What is congestion and what are the causes of congestion? Explain token bucket algorithm of congestion control.		4
Q6(b)	Define fragmentation and explain why the IPv4 and IPv6 protocols need to fragment some packets. Is there any difference between the two protocols in this matter?		4

SECTION-C	Attempt **ANY ONE** following Question	Marks **(1X10=10)**	CO
Q7(a)	Compare the TCP header and the UDP header. List the fields in the TCP header that are missing from UDP header. Give the reason for their absence.		5
Q7(b)	Write short notes on : (i) MIME (ii) HTTP Transaction		5