(Please write your Exam Roll No.) Exam Roll No. 0081503021

# END TERM EXAMINATION

**FIFTH SEMESTER [B.TECH] JANUARY 2024**

**Paper Code: CIC-313** **Subject: Computer Networks**

**Time: 3 Hours** **Maximum Marks: 75**

***Note: Attempt five questions in all including Q.No1 which is compulsory. Select one question from each unit. Assume missing data. if any***

Q1 Attempt **any Five** **[3x5=15]**

a) How does the backoff mechanism work in CSMA/CD?

b) What are various types of addresses used for TCP/IP protocol?

c) Explain Wavelength with a suitable diagram.

d) Differentiate choke packet and back pressure in congestion control with a suitable diagram.

e) Explain the Process-to-Process and Node-to-node delivery in the OSI model.

f) Difference between the Client-server model and Peer-to-peer model.

## UNIT-I

Q2 a) What is the OSI reference model? Draw a block diagram and explain the functioning of each layer. **[8]**

b) What is transmission media? Discuss how guided and unguided types of media facilitate the transmission of data. Explain in detail. **[7]**

Q3 a) What is the checksum method? Implement the checksum method on the given data value 11001100 10101010 11110000 11000011 for error detection.

b) Assume that a voice channel occupies a bandwidth of 4kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required bandwidth.

## UNIT-II

Q4 a) How does the presence of collisions impact the performance of a CSMA/CD network? Also, explain the types of persistence used in CSMA. **[8]**

b) What is ARQ? Explain the working of Go-back-N and Selective Repeat ARQ with the sliding window. **[7]**

Q5 a) Define and explain the data link layer in IEEE Project 802. Why is this layer divided into sub-layers? Also, explain the IEEE 802.3 Protocol. **[8]**

b) Explain the following: **[7]**

i) Control Protocols in Medium Access Control

ii) HDLC

## UNIT-III

Q6 a) What is the concept of Routing? Give the name of the intranet and internet routing protocols. And, how the Distance Vector Routing Algorithm works? Explain with a suitable example. **[8]**

b) What is IP addressing? Explain the IP addresses in the network layer. Also, discuss the differences between IPv4 and IPv6 addresses. **[7]**

Q7 a) An ISP is granted a block of addresses starting with 190.100.0.0/16 (65536 addresses). The ISP needs to distribute these addresses to three groups of customers as follows:

i) The first group has 64 customers; each needs 256 addresses.

ii) The second group has 128 customers; each needs 128 addresses.

iii) The third group has 128 customers; each needs 64 addresses **[8]**

b) What is Congestion? Explain different Congestion Control Strategies. **[7]**

## UNIT-IV

Q8 a) Explain the following: - **[8]**

i) SMTP & POP

ii) UDP header

b) Explain the TCP Header in detail. Also, describe the role of TCP flow control for efficient data transfer. [7]

Q9 a) A datagram of 3050 bytes (20 bytes of IP header + 3030 bytes IP payload) reached the router and must be forwarded to link with MTU (maximum transmission unit) of 500 bytes. How many fragments will be granted also write the Maximum Frame, offset, and total length value for all. **[8]**

b) Explain the following: **[7]**

i) Socket address and Berkeley Socket in detail.

ii) DNS

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