Dr Dhrijit Bhattacharya 4/5/2023

Roll No.:

National Institute of Technology, Hamirpur (HP)
Name of Examination: End Semester Examination (May 2023)

Branch: ECE (4 Year and DD) **Semester:** VIII
Subject: Data Communication and Computer Networks **Subject Code:** EC-421
Time: 03 Hours **Maximum Marks:** 50

Note:
1. All questions are compulsory
2. Assume suitable data whenever necessary

1 Draw the Encoder and decoder structure for the cyclic redundancy check (CRC) code. Further show the process of generating the C(7,4) CRC code for the dataword 1001 by considering the mutually agreed (between encoder and decoder) divisor 1011. **5**

2. What are the different protocols used for flow and error control in datalink layer? Clearly explain the sender and receiver side algorithms for stop-and-wait ARQ protocol. **6**

3 In the context of computer networking, provide a detailed explanation of File Transfer Protocol (FTP) and Hypertext Transfer Protocol (HTTP). **7**

4 Discuss carrier sense multiple access technique with clear diagram. **5**

5 i) A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces: **5**

a. 1000 frames per second b. 500 frames per second c. 250 frames per second.

ii) What will be the value of the throughput for above three cases if the network uses slotted ALOHA.

6 An organisation is given the block 17.12.40.0/26, which contains 64 addresses. The organisation has three offices and needs to divide the addresses into three subblocks of 32, 16, 16 addresses. Find the new masks, draw the configuration, and assign IP addresses to every device in that organisation. **5**

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7 Discuss about the different fields in the IPv4 datagram in detail. What is the difference between IPv4 and IPv6? **5**

8 Discuss about the TCP segment format. Further with clear diagrams explain the procedures for TCP connection establishment, data transfer, and connection termination phases. **7**

9 Explain the functions and responsibilities of the transport layer and network layer in the TCP/IP protocol suite. **5**