

# Indian Institute of Technology Roorkee

Department of Computer Science and Engineering

Mid-Term Exam, Session: July 2024

Subject code: CSN-341

Course Title: Computer Networks

Max Marks: 30

Time Allowed: 1.5 Hour

**Important Instructions:** 1. Attempt ALL questions.

2. Attempt all parts of a question together. Attempt questions in the same order as given in the question paper.

3. In addition to correctness of answer, the quality of the answer will also be considered during evaluation.

4. All the diagrams must be neatly and properly drawn with proper captions. Every component of the diagram and the diagram as a whole should be self-explanatory; otherwise it will not be evaluated.

## Question-1

Consider the following functionalities needed for communication between hosts connected through Internet. Specify the corresponding layer of the TCP/IP protocol suite at **which** each of these functionalities is performed. Also, briefly **explain** each of these functionalities.  $[(0.5+0.5)*4= 4 \text{ Marks}]$

- a) Responsibility for handling frames between adjacent nodes
- b) Transforming bits to electromagnetic signals
- c) Route determination
- d) Providing services to the end user

## Question-2

Answer following questions along with proper justification/description. Answer without justification/description will be awarded zero marks. You can also use appropriate diagrams to explain/justify.  $[(1+1)*3= 6 \text{ Marks}]$

- a) **Can** a server retrieve file from the client side using FTP? **Justify** your answer.
- b) At receiver side, when IP protocol decapsulates the transport layer packet, **how** it knows to which protocol, TCP or UDP, the packet should be delivered? **Justify** your answer.
- c) If there is a single path between the source host and the destination host, **do** we need a router between the two hosts? **Justify** your answer.

P.T.O.



### Question-3

A user wants to use a http client to access the corresponding http server running on a remote host. The user knows only the http server name, *httpserver.com*. But, the TCP/IP protocol suite needs the IP address of the server to make the connection. With reference to this scenario, answer the following:

- (a) How DNS (Domain Name System) can be helpful in this context? **Explain in steps** along with proper **diagram**. [4 Marks]
- (b) **Where** is the use of client-server model in this activity of finding the IP of the http server? **Explain**. [2 Marks]

### Question-4

[2\*2 = 4 Marks]

- a) If the file to be retrieved from server is in the form of a webpage embedded in an HTML document, which protocol is most appropriate to use out of HTTP and FTP? Also provide reason of your answer.
- b) What is the difference in the purpose of using HELO and MAIL FROM command in SMTP? **Explain**.

### Question-5

[3\*2 = 6 Marks]

- a) Can FTP use the services of UDP for control connection and data connection? Justify.
- b) Explain various components of a generic Web browser with the help of a diagram.

### Question-6

[3+1=4 Marks]

- a) In a Go-Back-N sliding window protocol, if 4 is the size of sequence number field, **what** is the maximum allowed size of send window and receive window? Also explain with the help of a **diagram**.
  - b) During an ideal communication using this protocol where the packets are transmitted by sender side at very high speed, **how many** packets will be in transit filling the pipe?
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