(T) Roll No. .....

PAPER ID—11191

B.Tech. EXAMINATION, 2024

(Fifth Semester)

COMPUTER SCIENCES AND INFORMATION TECHNOLOGY

Computer Networks

Time : 3 *Hours* *Maximum Marks :* 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is the difference between circuit switching and packet switching ?

(b) Differentiate between classful and classless addressing.

(c) How does ARP differ from RARP ?

(d) Explain the concept of QoS.

(e) How many channels does FTP uses ? How ?

(f) What is the role of SMTP in e-Mail system ?

(g) What is piggybacking in sliding window protocol ? **2×7=14**

Unit I

2. (a) Define Topology. Briefly describe various network topologies stating their advantages and disadvantages. 7

(b) What is Multiplexing ? Compare various forms of multiplexing using suitable diagrams. 7

3. (a) Describe the structure of TCP/IP model. What are the functions of each layer and the key protocols at each layer ? 7

(b) What is distributed computing ? Explain its key features and applications. 7

Unit II

4. (a) Explain pure ALOHA and slotted ALOHA systems. Calculate the expressions for the efficiency of each. 7

(b) What is Go-back-N protocol ? How does it handle packet loss as compared to Stop-and-Wait ARQ ? 7

5. (a) Define RARP. How does it differ from ARP ? Explain the working of RARP and draw its packet header. 7

(b) An ISP is assigned a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 1600 customers as follows : 7

(i) The 1st group has 200 units with each requiring 128 addresses.

(ii) The 2nd group has 400 units with each requiring 16 addresses.

(iii) The 3rd group has 1000 units with each requiring 4 addresses.

Design the sub-blocks and give the slash notation for each block.

Unit III

6. (a) Why is routing required in the networks ? Classify and explain different routing types giving advantages and disadvantages of each type. Also give *two* examples of each. 7

(b) Explain in detail the various timers used by TCP. 7

7. (a) How is connection established in TCP ? Explain in detail various connection establishment scenarios. 7

(b) For the following network, find the shortest path from node C to every other node. 7

Unit IV

8. (a) What is DNS ? How does it work ? What are the various resource records associated with it ? 7

   (b) What are the different types of security attacks ? Classify and describe various attacks with examples. 7

9. (a) Which protocols are used in the e-mail system ? How ? Describe their function in e-mail system with flow diagram. 7

   (b) What are Firewalls ? Discuss their key characteristics and elaborate different types. 7