

U.G. 4th Semester Examination - 2022

COMPUTER SCIENCE

[HONOURS]

Course Code : COM.SC-H-CC-L-409

(Computer Networks)

Full Marks : 60 Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP–A

1. Answer any **ten** questions: 2×10=20
- a) In which layers of OSI reference model, Bridge, Switch, Router and Gateway work?
 - b) What are the functions done by Session layer of OSI reference model?
 - c) Explain bus topology.
 - d) What are the differences between guided and unguided media?
 - e) What are the different types of bit errors in data communication?

[Turn over]

- f) What is the main modification done in packet switching over message switching?
- g) What are the roles of a network administrator?
- h) What is the working principle of DNS?
- i) What is error control? In which layer of OSI reference model, congestion control is done?
- j) What is MAC address?
- k) Explain transmission time and propagation delay in data communication.
- l) Explain Manchester encoding with an example.
- m) What is baud rate in digital communication?
- n) Write down the advantages of IPv6 over IPv4.
- o) What are the different aspects of network security?

GROUP–B

- Answer any **four** questions: 5×4=20
2. Explain the client-server network application architecture. How it is different from P2P network application architecture? 4+1

3. Explain Leaky Bucket algorithm for congestion control. How UDP is different from TCP? 3+2
4. What do you understand by bit Stuffing and byte Stuffing? Explain with examples. 3+2
5. What is a routing table? How routing table is updated in static routing and dynamic routing? 1+4
6. What are the functionalities provided by Data-link layer of OSI reference model? 5
7. Briefly explain the working principle of the following protocols: HTTP and FTP. 3+2

GROUP-C

Answer any **two** questions: 10×2=20

8. a) Calculate the checksum for the binary message sequence:
10010000111011011001010110100101
- b) A bit stream 11011010110 is to be transmitted using the standard CRC method. The generator polynomial is x^3+x^2+1 . What is the actual bit string transmitted? 4+6

9. a) You have an IP address of 192.16.13.5 with a 255.255.255.127 subnet mask. What is your class of address, subnet address, and broadcast address?
- b) An organization is using an IP network 175.100.0.0 and needs 1000 subnets and 60 usable hosts in each subnet. Determine the subnet mask. Also determine the 1st host address of the 4th subnet and last host address of the 9th subnet. 5+5
10. a) Discuss the roles of various fields related to the TCP segment header.
- b) Describe 3-way handshaking method with proper diagrams. 5+5
11. Write short notes on (any **two**): 5×2=10
 - a) Slotted Aloha and Pure Aloha
 - b) Pooling
 - c) Go back N ARQ
 - d) LAN Topology