

**K. J. Somaiya Institute of Technology, Sion, Mumbai-22**  
(Autonomous College Affiliated to University of Mumbai)

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|--|----------------------|----------------|
| May-June 2024  |                      |                |
| (B.Tech.) Program: <b>EXTC</b> Scheme : <b>II</b>                                  |                      |                |
| Regular Examination: <b>TY</b> Semester: <b>V</b>                                  |                      |                |
| Course Code: <b>EXC604</b> and Course Name: <b>Computer Communication Networks</b> |                      |                |
| Date of Exam: <b>27/05/24</b>  | Duration: 02.5 Hours | Max. Marks: 60 |

| <p>Instructions:</p> <p>(1) All questions are compulsory.</p> <p>(2) Draw neat diagrams wherever applicable.</p> <p>(3) Assume suitable data, if necessary.</p> |  |            |     |          |
|---|--|------------|-----|----------|
| QN  | Questions  | Max. Marks | CO  | BT level |
| Q 1   | Solve any six questions out of eight:  | 12         |     |          |
| i)  | What do you mean by peer to peer communication? Describe centralized peer to peer sharing. | 2          | CO1 | U        |
| ii)   | What are the Types of Transmission Media in Computer Networks?                             | 2          | CO2 | U        |
| iii)  | What are the primary services provided by the network layer in the OSI model?              | 2          | CO4 | U        |
| iv)   | Explain the purpose of framing in a data link layer protocol?                              | 2          | CO3 | U        |
| v)  | What is SMTP, and what role does it play in email communication?                           | 2          | CO6 | U        |
| vi)   | What is the checksum in IPv4?  | 2          | CO4 | U        |
| vii)  | What is the port address? What is the significance of the port address?                    | 2          | CO5 | U        |
| viii)   | What is the primary function of a Network Interface Card (NIC)?                            | 2          | CO1 | U        |
| Q.2   | Solve any four questions out of six.   | 16         |     |          |
| i)  | Compare between pure ALOHA and Slotted ALOHA   | 4          | CO3 | U        |
| ii)   | Describe the process of establishing a TCP connection using the three-way handshake.       | 4          | CO5 | U        |
| iii)  | How does SMTP ensure the reliability of email delivery?                                    | 4          | CO6 | U        |
| iv)   | Explain Dijkstra Algorithm with one example  | 4          | CO4 | Ap       |



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|      |   |    |     |    |
|------|---|----|-----|----|
| v)   | Describe the various network topologies along with the advantages and disadvantages of each   | 4  | CO1 | U  |
| vi)  | Explain various transmission media in detail.   | 4  | CO2 | U  |
| Q.3  | Solve any two questions out of three.   | 16 |     |    |
| i)   | Explain OSI Model   | 8  | CO1 | U  |
| ii)  | Design an IPv4 addressing scheme that satisfies the requirements mentioned below. Specify the network address, subnet mask, and addresses for at least two devices in each department.<br><br>Suppose you are tasked with designing an addressing scheme for a small network with the following requirements:<br><ul style="list-style-type: none"> <li>• The network will have a maximum of 50 devices.</li> <li>• There are three departments within the organization: Sales, Marketing, and Engineering.</li> <li>• Each department requires a subnet with a maximum of 20 devices.</li> <li>• The network should support both IPv4 addressing.</li> <li>• Provide addresses for at least two devices in each department.</li> </ul> | 8  | CO4 | Ap |
| iii) | What is QoS? Explain various techniques to improve QoS.   | 8  | CO5 | U  |
| Q.4  | Solve any two questions out of three.   | 16 |     |    |
| i)   | Explain how the concept of repeaters, hubs, bridges, routers, gateways, and switches is applied in real-world network scenarios. Provide examples of how each device is utilized to facilitate efficient communication within different network environments, such as local area networks (LANs), wide area networks (WANs), and the internet.  | 8  | CO2 | Ap |
| ii)  | Explain working principle of selective repeat ARQ   | 8  | CO3 | U  |
| iii) | Compare and contrast the functionalities and security features of TELNET and SSH protocols. Discuss how each protocol facilitates remote access to network devices and servers, highlighting differences in authentication methods, encryption techniques. Provide examples of scenarios where TELNET or SSH would be preferred based on their respective security and functionality characteristics.   | 8  | CO6 | Ap |