

# JK Lakshmipat University Jaipur

## INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, April 2024

BCA Semester IV

Roll No.....

CS1124: Computer Networks & Network  
Administration

Time: 2.5 hours

Max. Marks: 30

Instructions to students:

1. non-programmable Scientific calculator is allowed.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

| Q.1B                | Short answer type questions (2 questions @ 2.5 marks)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |          |                |             |                |             |                |             |                 |             |                            |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|----------------|-------------|----------------|-------------|----------------|-------------|-----------------|-------------|----------------------------|
| I.                  | Provide examples of well-known port numbers and the corresponding services or protocols associated with them. Include ports for HTTP, HTTPS, FTP, SSH, and DNS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 02<br>Marks<br>CO5         |          |                |             |                |             |                |             |                 |             |                            |
| II.                 | Decompress the following addresses and show the complete unabbreviated IPv6 address:<br>A). 0:0:FFFF::<br>B). 1234:2346::1111<br>C). 0:1::1200:1000<br>D). ::FFFF:24.123.12.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 02<br>Marks<br>CO3         |          |                |             |                |             |                |             |                 |             |                            |
| Q.2A                | <p>A router has the following (CIDR) entries in its routing table:</p> <table><tr><th>Destination Gateway</th><th>Next Hop</th></tr><tr><td>170.46.56.0/21</td><td>Interface 1</td></tr><tr><td>170.46.48.0/20</td><td>Interface 2</td></tr><tr><td>170.53.40.0/22</td><td>Interface 3</td></tr><tr><td>Default Gateway</td><td>Interface 4</td></tr></table> <p>For each of the following IP addresses, what does the router do if a packet with that address arrives?</p> <p>1) 170.46.63.10/21<br/>2) 170.46.67.14/21<br/>3) 145.46.52.2/22<br/>4) 176.53.40.7/24<br/>5) 176.53.56.7/24</p> <p>Show your calculations step by step and provide the next hop for each destination IP.</p> | Destination Gateway        | Next Hop | 170.46.56.0/21 | Interface 1 | 170.46.48.0/20 | Interface 2 | 170.53.40.0/22 | Interface 3 | Default Gateway | Interface 4 | 04<br>Marks<br>CO2,<br>CO3 |
| Destination Gateway | Next Hop                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |          |                |             |                |             |                |             |                 |             |                            |
| 170.46.56.0/21      | Interface 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |          |                |             |                |             |                |             |                 |             |                            |
| 170.46.48.0/20      | Interface 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |          |                |             |                |             |                |             |                 |             |                            |
| 170.53.40.0/22      | Interface 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |          |                |             |                |             |                |             |                 |             |                            |
| Default Gateway     | Interface 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |          |                |             |                |             |                |             |                 |             |                            |
| Q.2B                | <p>The following is a dump of a TCP header in hexadecimal format.<br/>00CD0018 00000EF1 00000D5D 502200D1 01BF0010</p> <p>i).What is the source port number?<br/>ii).What is the destination port number?<br/>iii).What is the sequence number?<br/>iv).What is the acknowledgment number?<br/>v).What is the length of header?<br/>vi).What is the type of segment?<br/>vii).What is the window size?</p>                                                                                                                                                                                                                                                                                  | 04<br>Marks<br>CO4,<br>CO2 |          |                |             |                |             |                |             |                 |             |                            |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Q.2C | Compare and contrast TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) in terms of their key features, reliability mechanisms, and use cases.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 04<br>Marks<br>CO4                 |
| Q.3A | Explain the purpose of DHCP in a network environment. Describe the key components of DHCP, including DHCP server, client, and lease allocation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 02<br>Marks<br>CO4                 |
| Q.3B | Describe the process of TCP three-way handshake. How does it establish a reliable connection between two devices?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 03<br>Marks<br>CO2                 |
| OR   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                    |
| Q.3C | What is sliding window protocol? Differentiate between stop-and wait ARQ and Go-back-N protocol?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 03<br>Marks<br>CO3                 |
| Q.4A | For the network 156.26.93.0/19, answer the following questions:<br>1) How many IP addresses can be allocated?<br>2) What is the first and last IP address of given IP address block?<br>3) What is the subnet mask?<br>4) write details of Block 6 and Block 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 04<br>Marks<br>CO3                 |
| Q.4B | You have been tasked with designing the network infrastructure for a university campus that includes three main buildings: Academic Building (Building A), Administrative Building (Building B), and Student Center (Building C).<br><b>Building A:</b> Contains classrooms, labs, and faculty offices where high-speed connectivity and multimedia support are essential.<br><b>Building B:</b> Houses administrative offices, including finance, HR, and student services.<br><b>Building C:</b> Includes student lounges, dining areas, and recreational spaces where Wi-Fi connectivity and guest access are critical.<br>a) What type of network should be deployed in the building A and what equipment should be installed?<br>b) What type of network should be deployed in the building B and what equipment should be installed?<br>c) What type of network should be deployed in building C and what equipment should be installed?<br>d) What type of network connections should be used to link the buildings together and where and how should the university's Internet connection be made?<br>e) Draw Topology of this network. | 05<br>Marks<br>CO4,<br>CO5,<br>CO6 |

\*\*\*\*\* All The Best\*\*\*\*\*