Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET-B

SCHOOL OF ENGINEERING

END TERM EXAMINATION –MAY/JUNE 2024

Semester : Semester II-2023-24-BCA - 2023
Course Code : CSA2004
Course Name : Computer Networks

Program : B.Tech. Computer Science and Engineering

Date : JUNE 11-2024
Time : 9:30AM -12:30 PM
Max Marks :100

Weightage : 50%

Note:
1. **Answer ALL 5 FULL Questions.**
2. **Each Full Question carries 20 Marks**
3. **Scientific and non-programmable calculator are permitted.**
4. **Do not write any information on the question paper other than Roll Number.**

1.a.	Identify and describe the components of a Data Communication System. **[Knowledge]**	**(CO1)**	**(04 Marks)**
1.b.	Identify and explain the connective devices in a network **[Comprehension]**	**(CO1)**	**(06 Marks)**
1.c.	Apply the OSI reference model to explain the functionalities of each layer and how they interaction network communication. **[Application]**	**(CO1)**	**(10 Marks)**
	or		
2.a.	List the fundamental characteristics of a Data Communication System. **[Knowledge]**	**(CO1)**	**(04 Marks)**
2.b.	Explain the factors that affect the performance of a network **[Comprehension]**	**(CO1)**	**(06 Marks)**
2.c.	Analyze the TCP/IP model by explaining the functionalities of each layer and how they contribute to data transmission over a network **[Application]**	**(CO1)**	**(10 Marks)**
3.a.	Suppose a signal travels through a transmission medium and its power is reduced to one-half. Given that $P2 = 0.5P1$, calculate the attenuation (loss of power) for this case. **[Knowledge]**	**(CO2)**	**(04 Marks)**
3.b.	Explain how an encoder and decoder work for single parity check. **[Comprehension]**	**(CO2)**	**(06 Marks)**
3.c.	Given the data word 101001111 and the divisor 10111, demonstrate the generation of the CRC code word at the sender site using binary division. **[Application]**	**(CO2)**	**(10 Marks)**

or

4.a.	Given data units, calculate the parity bit assuming even parity for each of the following: **[Knowledge]** a. 1001011 b. 0001100 c. 1000000 d. 1110111	**(CO2)**	**(04 Marks)**
4.b.	Describe the simplest protocol in detail. **[Comprehension]**	**(CO2)**	**(06 Marks)**
4.c.	In a Go-Back-N protocol with a window size of 4, determine the total number of transmissions required if every 6th packet is lost and 10 packets need to be sent. **[Application]**	**(CO2)**	**(10 Marks)**
5.a.	Convert the following binary IP addresses to dotted-decimal notation: **[Knowledge]** a. 01011110 10110000 01110101 00010101 b. 10001001 10001110 11010000 00110001 c. 01010111 10000100 00110111 00001111 d. 10010011 11110000 10101010 10001000	**(CO3)**	**(04 Marks)**
5.b.	Describe the services provided by the network layer. **[Comprehension]**	**(CO2)**	**(06 Marks)**
5.c.	How is addressing structured in IPv4, and analyze the difference between IPV4 and IPV6?**[Application]**	**(CO3)**	**(10 Marks)**

or

6.a.	Identify the class of these class full IP addresses: **[Knowledge]** a. 130.34.54.12 b. 200.34.2.1 c. 245.34.2.8 d. 102.120.201.10	**(CO3)**	**(04 Marks)**
6.b.	Difference Between Distance Vector Routing and Link State Routing **[Comprehension]**	**(CO3)**	**(06 Marks)**
6.c.	Describe the process of connection establishment and termination using the three-way handshake. **[Application]**	**(CO3)**	**(10 Marks)**
7.a	Write a short note on IPv6. **[Knowledge]**	**(CO4)**	**(04 Marks)**
7.b.	Explain the functionality of Simple Mail Transfer Protocol. **[Comprehension]**	**(CO4)**	**(06 Marks)**
7.c	How would you implement a firewall to enhance network security, and what functions does it perform to protect the network? **[Application]**	**(CO4)**	**(10 Marks)**

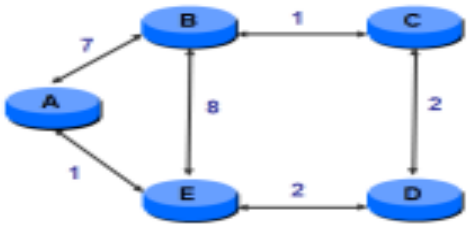
or

8.a	What are the basic principles of cryptography? **[Knowledge]**	**(CO4)**	**(04 Marks)**
8.b.	Explain how UDP works **[Comprehension]**	**(CO4)**	**(06 Marks)**
8.c	Explain the operation of TCP with neat sketch. **[Application]**	**(CO4)**	**(10 Marks)**
9.a	Describe how to protect email and list the steps to secure email **[Knowledge]**	**(CO3)**	**(04 Marks)**

9.b Describe common security issues in information security. **[Comprehension]** **(CO3)** **(06 Marks)**

9.c Given a network with 5 routers (A to E) connected with links having specific weights, use the distance vector routing algorithm to solve the following: **[Application]** **(CO3)** **(10 Marks)**

1. Construct the initial routing table for each router.
2.Update the routing tables for A to E after exchanging information.
3.Determine the minimum distance between Node A and Node E.



or

10.a List the responsibilities of the transport layer. **[Knowledge]** **(CO4)** **(04 Marks)**

10.b How do you determine the prefix length (n) in classless addressing for the following block sizes(N)? **[Comprehension]** **(CO4)** **(06 Marks)**

a. N = 1
b. N = 1024
c. N = 232

10.c Discuss how the Domain Name System (DNS) works and its importance in networking **[Application]** **(CO4)** **(10 Marks)**