**B.Tech. DEGREE EXAMINATION, MAY 2023**
Sixth Semester

**18CSC363J – COMPUTER NETWORKS**
*(For the candidates admitted during the academic year 2018-2019 to 2021-2022)*

**Note:**
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours                                                                 Max. Marks: 100

**PART – A (20 × 1 = 20 Marks)**
Answer **ALL** Questions

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 1. | Which of the following transmission directions listed is not a legimate channel? | 1 | 1 | 1 | 1 |

    (A) Simplex            (B) Half duplex
    (C) Full duplex        (D) Double duplex

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 2. | What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences? | 1 | 2 | 1 | 1 |

    (A) Unshielded twisted pair    (B) Optical fiber
    (C) Coaxial cable          (D) Microwave

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 3. | Which of the following one is not a network topology? | 1 | 2 | 1 | 1 |

    (A) Star              (B) Ring
    (C) Bus              (D) Peer to peer

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 4. | Which of the following device is used to connect similar LAN with same protocols? | 1 | 2 | 1 | 1 |

    (A) Gateways        (B) Bridges
    (C) Router          (D) Switches

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 5. | In _____ protocols, we use _____. | 1 | 1 | 2 | 1 |

    (A) Byte oriented, bit stuffing    (B) Character oriented, bit stuffing
    (C) Bit oriented, bit stuffing      (D) Byte oriented, character oriented

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 6. | The _____ protocol has flow control, but not error control | 1 | 2 | 2 | 1 |

    (A) Stop and wait      (B) Simplest
    (C) Go back N ARQ    (D) Selective repeat ARQ

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 7. | In selective repeat ARQ, if 5 is the number of bits for the sequence number, then the maximum size of the receive window must be _____. | 1 | 1 | 2 | 1 |

    (A) 15            (B) 16
    (C) 31            (D) 1

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| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 29. a.i. | The message 11001001 is to be transmitted using CRC error detection algorithm. Assuming the CRC polynomial to be $X^3+1$. Determine the message that should be transmitted. If the second left most bit is corrupted, show that it is detected by the receiver. | 6 | 4 | 2 | 2 |
| ii. | Explain the steps involved in sender and receiver side in checksum. | 6 | 3 | 2 | 1 |

**(OR)**

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| b. | Demonstrate how frame order and flow control is achieved using the data link layer. | 12 | 3 | 2 | 1 |

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 30. a.i. | An organization like SRM is given a block of addresses, and we are aware that one of those addresses is 210.10.2.8/28. Find the block's first address, last address, and total number of addresses. Also find how many hosts and subnets are offered by 150.10.0.1/22 as a network address? | 6 | 4 | 3 | 4 |
| ii. | An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. Can the data be encapsulated in one frame? If not, how many frames need to be sent? What is the size of the data in each frame? | 6 | 4 | 3 | 4 |

**(OR)**

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| b. | Explain the importance of BOOTP and the congestion control strategies used to enhance the computer network's Quality of Service (QoS). | 12 | 3 | 3 | 1 |

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 31. a.i. | The following is a dump of a UDP header in hexadecimal format $CB84000D001C001C$ | 8 | 4 | 4 | 4 |

    (1) What is the source port number?
    (2) What is the destination port number?
    (3) What is the total length of the user datagram?
    (4) What is the length of the data?

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| ii. | Suppose a TCP connection is transferring a file of 5,000 bytes. The first byte is numbers 10,001. What are the sequence numbers for each segment if data are sent in five segments, each carrying 1,000 bytes? | 4 | 4 | 4 | 4 |

**(OR)**

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| b.i. | Discuss the three main division of the domain name system. | 6 | 3 | 4 | 1 |
| ii. | What steps would you take to ensure DNS records are updated in timely manner? | 6 | 3 | 4 | 1 |

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| 32. a. | Explain the basic concepts of cryptography and its applications. | 12 | 3 | 5 | 1 |

**(OR)**

| | | Marks | BL | CO | PO |
|---|---|---|---|---|---|
| b. | Discuss in detail about electronic mail and the protocol that supports Email. | 12 | 3 | 5 | 1 |

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8. The media access central address of the network card is used in both Ethernet and token-ring network and is essential for communication. What does MAC provide?      1  1  2  1
   (A) An alias for the computer name
   (B) The logical domain address for the workstation
   (C) A physical address that is assigned by the manufacturer
   (D) A physical address that is randomly assigned each time the computer is started

9. The network layer is concerned with _____ of data.      1  1  3  1
   (A) Bits
   (B) Frames
   (C) Packets
   (D) Bytes

10. _____ is an implementation of the distance vector protocol.      1  2  3  1
    (A) RIP
    (B) OSPF
    (C) BGP
    (D) LSPF

11. Identify the class of the following IPv4 address: 229.1.2.3      1  1  3  1
    (A) Class A
    (B) Class B
    (C) Class D
    (D) Class C

12. What is the size of the destination part in the UDP protocol?      1  2  3  1
    (A) 8 bits
    (B) 16 bits
    (C) 20 bits
    (D) 32 bits

13. Which among the several transport services deals with the addresses, protocol utility class in addition to performance evaluating features in a connection?      1  1  4  1
    (A) Connection management
    (B) Quality of service
    (C) User interface
    (D) Status reporting

14. To achieve reliable transport in TCP, _____ is used to check the safe and sound arrival of data      1  2  4  1
    (A) Packet
    (B) Buffer
    (C) Segment
    (D) Acknowledgement

15. FTP uses _____ parallel TCP connection to transfer a file.      1  1  4  1
    (A) 1
    (B) 2
    (C) 3
    (D) 4

16. In HTTP pipelining      1  2  4  1
    (A) Multiple HTTP requests are sent on a single TCP connection without waiting for the corresponding responses
    (B) Multiple HTTP requests cannot be sent on a single TCP connection
    (C) Multiple HTTP requests are sent in a queue on a single TCP connection
    (D) Multiple HTTP requests are sent at random on a single TCP connection

17. The commands from client to server and replies, from server to client, are sent across the control connection in _____ bit ASCII format.      1  2  5  1
    (A) 8
    (B) 7
    (C) 3
    (D) 5

18. The data transfer mode of FTP, in which all the fragmenting has to be done by TCP is _____.      1  1  5  1
    (A) Stream mode
    (B) Block mode
    (C) Compressed mode
    (D) Message mode

19. In the network HTTP resource are located by _____.      1  2  5  1
    (A) Uniform resource identifier
    (B) Unique resource locator
    (C) Unique resource identifier
    (D) Union resource locator

20. The time taken by a packet to travel from client to server and then back of the client is called _____.      1  1  5  1
    (A) STT
    (B) RTT
    (C) PTT
    (D) JTT

## PART – B (5 × 4 = 20 Marks)
### Answer ANY FIVE Questions

21. State the purpose of layering in networks.      4  3  1  1

22. Name the factors that affect the security of the network.      4  3  1  1

23. List the steps involved in creating the checksum.      4  4  2  1

24. What is the usage of sequence number in reliable transmission?      4  3  2  1

25. How gateway is different from routers?      4  2  3  1

26. Why is an application such as POP needed for electronic messaging?      4  3  4  1

27. State the purpose of SNMP.      4  2  5  1

## PART – C (5 × 12 = 60 Marks)
### Answer ALL Questions

Marks  BL  CO  PO

28. a. You are the network administrator for a large company. You have just been tasked with setting up a new network system that will allow the company to share files between two different offices. Describe how the OSI model will be used to help felicitate the file sharing between the two offices.      12  4  1  2

### (OR)

b. Discuss in detail about guided media and unguided media for transmission.      12  3  1  1