



35025-44340



BRAINWARE UNIVERSITY

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Term End Examination 2025-2026
Programme – BCA-Hons-2024/BCA-Hons-2025
Course Name – Computer Network
Course Code - BCA20202
(Semester II)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. *Choose the correct alternative from the following :*

- (i) During troubleshooting, an engineer finds that framing errors occur between directly connected routers, but end-to-end communication remains intact. Which OSI layer is experiencing the fault?
 - a) Network
 - b) Transport
 - c) Data Link
 - d) Session
- (ii) An IT manager must choose a topology that offers high fault tolerance but accepts a higher installation cost. Which will be the most suitable topology?
 - a) Bus
 - b) Ring
 - c) Star
 - d) Mesh
- (iii) A university campus connects its academic blocks, hostels, and administration offices within a confined geographic area under a single authority. Identify this network.
 - a) MAN
 - b) LAN
 - c) WAN
 - d) Internet
- (iv) Which of the following is an unguided transmission medium?
 - a) Twisted pair cable
 - b) Coaxial cable
 - c) Satellite communication
 - d) Fiber optic cable
- (v) In what unit is the bandwidth of a digital signal typically expressed?
 - a) Hertz (Hz)
 - b) Baud rate
 - c) Bits per second (bps)
 - d) Decibels (dB)
- (vi) Interpret what is the primary advantage of using coaxial cables for data transmission.
 - a) High data rates
 - b) Low cost
 - c) Ease of installation
 - d) Long transmis. Continuous values sion distances
- (vii) Outline the name of the data transmission mode in which data flows in both directions but not at the same time.
 - a) Simplex
 - b) Half-Duplex

- c) Full-Duplex
- d) Multiplex
- (viii) Interpret the primary function of the address resolution protocol (ARP) in an IP network.
 - a) To map IP addresses to MAC addresses
 - b) To resolve domain names to IP addresses
 - c) To route packets between different networks
 - d) To perform error detection in data transmission
- (ix) Hamming code is used for:
 - a) Error detection only
 - b) Error correction only
 - c) Both detection & correction
 - d) None of these
- (x) Flow control is mainly used to:
 - a) Correct errors in frames
 - b) Manage data transmission between sender and receiver
 - c) Encrypt messages
 - d) Convert analog signals to digital
- (xi) Interpret which of the following devices amplifies signals to extend the distance over which data can travel.
 - a) Switch
 - b) Router
 - c) Repeater
 - d) Gateway
- (xii) Compare difference between a switch and a hub?
 - a) Switch forwards data to specific devices, while a hub broadcasts data
 - b) Hub is faster than a switch
 - c) Switch only operates at the Physical Layer
 - d) Hub operates at the Network Layer
- (xiii) Translate the role of the device responsible for interconnecting different networks and how it makes forwarding decisions based on IP addresses.
 - a) Hub
 - b) Switch
 - c) Router
 - d) Repeater
- (xiv) Choose the protocol responsible for ensuring process-to-process delivery in networking and justify your selection.
 - a) IP
 - b) TCP
 - c) Ethernet
 - d) ARP
- (xv) Select the size of a UDP header.
 - a) 8 bytes
 - b) 16 bytes
 - c) 20 bytes
 - d) 24 bytes

Group-B

(Short Answer Type Questions)

$$3 \times 5 = 15$$

2. Describe briefly the services provided by the Data Link Layer. (3)
3. Explain how different wired network topologies—star, bus, and ring—affect network reliability, scalability, and maintenance, by examining their structural characteristics and failure behavior. (3)
4. Distinguish between half-duplex and full-duplex. (3)
5. Distinguish between Guided and Unguided media in Data Communication. (3)
6. A company has been assigned the IPv4 address block 192.168.1.0/24. It needs to create 4 subnets of equal size. Calculate the subnet mask, the number of usable hosts per subnet, and the subnet addresses. (3)

OR

Given an IP address 172.16.50.25, determine its class and the default subnet mask. How many networks and hosts can be created in this class without subnetting? (3)

Group-C

(Long Answer Type Questions)

 $5 \times 6 = 30$

7. Compare serial and parallel data transmission.

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8. Define with examples: (a) Signalling Rate (b) Bit Rate (c) Baud Rate. (5)
9. Describe the difference between IPv4 and IPv6 addressing. (5)
10. What are the responsibility of Transport layer? (5)
11. Evaluate the effectiveness of the Token Bucket algorithm in handling bursty traffic compared to the Leaky Bucket algorithm. Justify your answer with reasoning. (5)
12. Change the following IPv4 addresses from binary notation to dotted-decimal notation: a. 10000001 00001011 00001011 11101111 b. 11000001 10000011 00011011 11111111 . (5)

OR

- Change the following IPv4 addresses from dotted-decimal notation to binary notation: a. 111.56.45.78 b. 221.34.7.82 . (5)

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