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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – B.Tech.(CSE)-AIML-2021/B.Tech.(CSE)-AIML-2022/B.Tech.(CSE)-DS-2022/B.Tech.(CSE)-AIML-2023/B.Tech.(CSE)-DS-2023/B.Tech.(CSE)-2023
Course Name – Computer Networks
Course Code - PCC-CSM502/PCC-CSD502/PCC-CSG502
(Semester V)

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) Choose the correct option. In computer networks, nodes are defined as __________.

a) the computer that originates the data b) the computer that routes the data
c) the computer that terminates the data d) all of the mentioned

(ii) Choose the correct option: The TCP/IP model does not have the _______ layer, but the OSI model has this layer.

a) session layer b) transport layer
c) application layer d) network layer

(iii) Select that a single channel is shared by multiple signals by the mechanism stated as

a) analog modulation b) digital modulation
c) multiplexing d) phase modulation

(iv) Choose the correct answer. Interpret the following tasks is not done by the data link layer.

a) framing b) error control
c) flow control d) channel coding

(v) Choose the correct option. Develop Closed-Loop control mechanisms.

a) Remove after congestion occurs b) Remove after sometime
c) Prevent before congestion occurs d) Prevent before sending packets

(vi) Identify the error detection technique that uses a polynomial division to generate a checksum

a) Hamming code b) CRC (Cyclic Redundancy Check)
c) Block coding d) Parity bit

(vii) First address in a block is used as network address that represents the _________

a) Class Network b) Entity
c) Organization d) Codes

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(viii) If you wanted to have 12 subnets with a Class C network ID, Select the subnet mask would you use?

a) 255.255.255.252 b) 255.255.255.255
c) 255.255.255.240 d) 255.255.255.248

(ix) Your router has the following IP address on Ethernet0: 172.16.2.1/23. Select from the following can be valid host IDs on the LAN interface attached to the router? i. 172.16.1.100 ii. 172.16.1.198 iii. 172.16.2.255 iv. 172.16.3.0

a) i only b) ii and iii only
c) iii and iv only d) ii only

(x) Predict when should we use default routing?

a) On stub networks- which have only one exit path out of the network
b) Which have more than one exit path out of the network
c) Minimum five exit paths out of the network
d) Maximum five exit paths out of the network

(xi) Suppose a TCP connection is transferring a file of 1000 bytes. The first byte is numbered 10001. Select the sequence number of the segment if all data is sent in only one segment.

a) 10000 b) 10001
c) 12001 d) 11001

(xii) In Three-Way Handshaking process, select the situation for both the TCP's issue an active open .

a) Mutual open b) Mutual Close
c) Simultaneous open d) Simultaneous close

(xiii) The sizes of source and destination port address in TCP header are extended as ___________ respectively.

a) 16-bits and 32-bits b) 16-bits and 16-bits
c) 32-bits and 16-bits d) 32-bits and 32-bits

(xiv) In computer security _______ express that the information in a computer system only be accessible for reading by authorized parities.

a) confidentiality b) integrity
c) availability d) authenticity

(xv) Select the following best describes how the Leaky Bucket algorithm works.

a) It sends packets at a variable rate based on available tokens
b) It allows data to overflow the buffer when the bucket is full
c) It sends packets at a constant rate, regardless of the incoming traffic burst
d) It increases the rate when there is a larger burst of traffic

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the Token Bucket algorithm work to regulate traffic in a network, and also discuss its significance in Quality of Service (QoS) management. (3)
3. List the advantages and disadvantages of Mesh topology. (3)
4. Differentiate between Pure ALOHA and Slotted ALOHA multiple access protocols. (3)
5. Compare and contrast distance vector and link-state routing protocols. (3)
6. Explain the role of DNS (Domain Name System) in the context of cybersecurity and how DNSSEC (DNS Security Extensions) enhances the security of DNS. (3)

OR

Discuss the differences between Telnet and SSH in terms of security and authentication mechanisms. Provide examples of scenarios where one is preferred over the other. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the concept of Queuing in UDP protocol with a diagram (5)

8. Enumerate the Advantages and Disadvantages of WAN. (5)
9. You receive a data message with a CRC value of 1010. After transmitting the message over a network, the CRC value at the receiver's end is calculated as 1110. Determine if there is an error in the received message. (5)
10. Explain the purpose of the RARP (Reverse ARP) protocol. How does it work, and in what scenarios might it be used in a network? (5)
11. Your organization is expanding its network infrastructure, and you need to plan for IP address allocation and management using DHCP. Describe a comprehensive DHCP implementation strategy, including subnetting, lease times, and redundancy considerations. (5)
12. Estimate the working of SMTP protocol. (5)

OR

Estimate the features of Bloototh (5)

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