TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2081 Baishakh

Exam.	Back		
Level	BE	Full Marks	80
Programme	BEI	Pass Marks	32
Year / Part	III / I	Time	3 hrs.

Subject: - Computer Network *(CT 613)*

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

NCE LIBRARY

1. Discuss Client-Server model and Peer-to-Peer model. Compare TCP/IP model with OSI reference model. [4+4]
2. What are the factors to be considered while selecting transmission media? Explain optical fiber cable in detail with its advantages and disadvantages. [2+6]
3. Compare Flag byte with byte stuffing and bit stuffing in Framing. Detect the error (if any) using CRC, if received frame is 0101101101 and generator polynomial is 1001. [2+6]
4. What are the criteria for good routing? Explain the general operation of RIP with timers. [2+6]
5. What is the Network address and broadcast address in IPv4 addressing? How do you assign the sub-net IP addresses to three LANs each 12,5 and 29 computers respectively? (Assume 202.35.91.32/25). [2+6]
6. Why do we need a transport layer? Draw the segment of UDP. Compare TCP with UDP. [2+2+4]
7. Draw the architecture of Email Agent. Why is DNS distributive in nature? Explain iterative query vs recursive query of DNS with examples and diagrams. [2+6]
8. Discuss any-cast and multi cast addresses in IPv6 with use cases. If there are IPv4 networks in between two IPv6 endpoints, what type of transition strategies will you suggest? Explain with examples and diagrams. [2+6]
9. What is IPSEC? Encrypt the plain text " MACHINE" using RSA algorithm. [2+6]
10. Write short notes on(Any Two) [2×4]
    a) HTTP methods
    b) VPN
    c) IDS.
    d) Token bucket Algorithm

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1. Why do you need layering? How does P2P works? Explain. [2+6]
2. Discuss briefly Delay, Bandwidth and MAC address. Discuss how data or packets goes through switch to switch in Frame Relay Virtual-circuit network. [3+5]
3. What are the services provided by data link layer? How CRC can be used to detect error? Explain with an example. [2+6]
4. Explain the Flooding algorithm with ways to minimize the duplication of packets. Write down steps for Link State Routing Protocol. [4+4]
5. What is private IP address? Company Allegro hired an IT expert. The expert was given task to perform logical design of the company with an IP block of 206.100.100.0/24. The company had 40,20,8,100 and 5 employees in its sales, admin, finance, support and HR departments respectively. Show how he was able to perform subnetting with minimum IP wastage. [2+6]
6. Discuss how multiplexing and de-multiplexing is achieved in Transport layer with examples. How is token bucket algorithm better than Leaky bucket in context with packet loss? Explain. [4+4]
7. Why is HTTPS not used for all web traffic? How FTP works? Explain. [2+6]
8. How extension header is used in IPV6 ? Explain dual stack transition mechanism from IPV4 to IPV6. [3+5]
9. Draw the block diagram of DES algorithm. Explain RSA with examples. [3+5]
10. Write short notes on: (Any Two) [2×4]
    a) Deffie Hellman Algorithm
    b) PGP
    c) ATM
    d) 802.3 CSMA.

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NCE LIBRARY

1. What is data encapsulation? Explain OSI reference model with suitable diagram. [2+6]
2. Define Throughput and Delay. Compare different types of guided transmission media with appropriate figures. [2+6]
3. Explain Selective repeat and Go back N ARQ with example. A bit string 01101110111111111011111110 needs to be transmitted with flag 7E at the data link layer. What is the string actually transmitted after bit stuffing? [6+2]
4. Why are different inter-AS and intra-AS protocols used in the internet? Compare and contrast link state and distance vector routing algorithms. [2+6]
5. Design a network for a company having 5 departments with 60, 42,30,10 and 12 hosts. Specify the network address, valid host range, broadcast address and subnet mask for each department from the given address 202.17.11.0/24. [10]
6. What are the differences between TCP and UDP? How do you implement packet congestion Control for better QOS? [4+4]
7. What is port address and socket address? Explain working principle of E-mail system with a proper diagram. [2+6]
8. What are the features of IPv6 header. Explain the strategies used for transition from IPv4 to IPv6. [3+5]
9. When can you say your network is compromised? And, how is it caused? How can you make your network secure using public key cryptography? [2+2+4]
10. Write short notes on: (Any Two) [2×3]
    a) X25 Network
    b) DHCP
    c) ALOHA

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Year / Part	III / I	Time	3 hrs.

Subject: - Computer Network *(CT 613)*

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NCE LIBRARY

1. Why layering is important? Explain Open System Interconnection (OSI) model and compare OSI with TCP/IP reference model. [2+6]
2. What are the factors to be considered while selecting media? Differentiate between datagram switching and virtual circuit switching approach. [2+6]
3. What are the services provided by data link layer? How does CSMA/CA protocol work to avoid the collision during hidden station problem? Explain with diagram. [2+4+2]
4. Suppose an ISP has 200, 250, 500 and 100 customers in the four different places say, A, B, C and D and need four point-to-point links. Provided an IP 10.0.48.0/21, you are required to perform subnetting with minimum waste of IP. Find out the subnet masks, network address, broadcast address, usable IP range and unusable IP range for each location. [10]
5. Define unicast and multicast routing. Compare distance vector and link state routing protocols with example. [2+6]
6. What is significance of port address? Discuss about different classes of port addresses defined by IANA. How can traffic congestion controlled by token Bucket method? [1+3+4]
7. What is DNS? Explain the working principle of DNS with a proper diagram. Compare IMAP and POP3 protocols. [1+4+3]
8. What are the factors that lead to the deployment of IPv6? Explain briefly about the process involved in transition of IPv4 to IPv6. [2+6]
9. What are the properties of secure communication? Encrypt and decrypt the message "BEIE" using RSA algorithm. [2+6]
10. Write short notes on: (Any Two) [2×3]
    a) Go back N ARQ
    b) Virtual circuit switching
    c) CRC

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