TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEX	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Computer Network (CT657)

✓ 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.

1. What are the reasons for using layered protocol? How the process of data encapsulation occurs in transmission mode described by seven layers of OSI model. [3+5]

2. What is switching? Compare between Circuit switching and packet switching. [3+5]

3. What are the different methods of framing? Explain any one method of framing with example. [2+6]

4. Why do we use dynamic routing? Explain with example how distance vector routing is used to route the packet and why count-to-infinity problem arises and how does it get solved. [2+6]

5. What is private IP address? You are given an IP address block of 201.40.58.0/24. Perform subnetting for four departments with equal hosts. [2+6]

6. What are the functions of transport layer? Explain the TCP segment format in detail. [3+5]

7. What is the function of proxy server? Explain the working of FTP in detail. [2+6]

8. Distinguish between IPv6 and IPv4. Explain about tunneling in IPv6. [4+4]

9. What do you mean by cryptography? Encrypt the message "MISCELLANEOUS" using RSA algorithm. [2+6]

10. Why network security is very important? Explain different types of firewall that can be used to secure the network. [2+6]

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Exam.		Back	
Level	BE	**Full Marks**	80
Programme	BEX	**Pass Marks**	32
Year / Part	III / II	Time	3 hrs.

Subject: - Computer Network *(CT657)*

✓ Candidates are required to give their answers in their own words as far as practicable.
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1. What are the reasons for using layered protocols? Compare OSI reference model and TCP/IP model. [3+5]

2. Differentiate between wired and wireless media with their benefits and drawbacks. Discuss Packet and Circuit switching concepts with example. [3+5]

3. Explain different types of ALOHA. Differentiate between Token bus and Token ring networks. [4+4]

4. What are the factors effecting the Congestion? Explain the operation of Link State Routing Protocol. [3+5]

5. Compare IMAP and SMTP. How a request initiated by a HTTP client is served by a HTTP server? Explain. How HTTPS works? [3+3+2]

6. Explain Transmission Control Protocol with its Header Formate? Compare it with User Datagram Protocol. [6+2]

7. Compare the header fields of IPV6 and IPV4. Explain about the process to simplify the writing of addresses of IPV6? [4+4]

8. Compare symmetric key encryption method with asymmetric key encryption. Describe the operation of RSA algorithm. [3+5]

9. What are digital signatures? Explain the operation of Data Encryption Standard algorithm. [2+6]

10. Write short notes: (Any two) [4+4]

    a) HUB, Switch and Routers
    b) Firewalls and their types
    c) Flow control / Mechanism of DLL

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1. Explain about the designed issues of Computer Network software. Distinguish between physical channel and physical layer. [5+3]

2. What do you mean by switching in communication? Compare Virtual Circuit and datagram approach with suitable diagram. [2+6]

3. Why do you think that the issues of media access is very important in data link layer? Explain about the operation of CSMA/CD. How can you make it more efficient? [3+5]

4. Institute of Medicine has 4 colleges. They need to be connected in same network. Allocate following numbers of IP addresses: 25, 68, 19 and 50 to those colleges by reducing the losses. The IP address provided to you to allocate is: 202.61.77.0/24. List the range of IP Addresses, their network address, broadcast addresses and corresponding subnet mask. [8]

5. What is congestion? What are the techniques for congestion control? Explain TCP three way handshaking process. [1+3+4]

6. Differentiate following points in the context of layers of TCP/IP. [3+2.5+2.5]

   a) SMTP and IMAP
   b) HTTP and DNS
   c) Port and socket

7. Why network layer is the key layer in OSI reference model? Describe the working principle of OSPF routing protocol. [2+6]

8. Explain IPV6 with its frame format. What methods are used so that IPV6 and IPV4 networks are interoperable? [4+4]

9. List the properties of secure communication. Encrypt and decrypt "BEX" using RSA algorithm. [8]

10. Write short notes on: (Any Two) [2×4]

   a) Medium Access Sub layer
   b) DNS Queries
   c) Firewalls

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Magh

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEX	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Computer Network *(CT657)*

✓ Candidates are required to give their answers in their own words as far as practicable.
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1. How the client-server model works? Differentiate it with peer-to-peer network with advantages and disadvantages. [3+5]

2. List guided and unguided media used in computer network. Explain Ethernet cable standards. [2+6]

3. What is PPP? Explain fault tolerance mechanism of FDDI. [2+6]

4. What is the importance of routing in computer networking? Explain how distance vector routing algorithm operates dynamically? What is its problem? [2+6+2]

5. What is physical address? You are given the IP address block 201.40.58.0/24. Design the subnet for 49, 27, 1145 hosts group so that IP address wastage is minimum. Find subnet mask, network ID, broadcast ID, assigned IP and unassigned IP range in each department. [2+6]

6. Define UDP with its header structure. Explain the leaky Bucket algorithm for traffic shaping. [4+4]

7. What is DNS? How can you transfer mail over internet? What are the protocols used on it? [1+4+3]

8. Explain IPV6 Headers with its features. Compare it with IPV4. [2+6]

9. What is cryptography? How Deffi Hellman algorithm negotiate a shared key between the receiver and transmitter. Explain with example. [2+6]

10. Write short notes on: (any two) [3×2]

    i) Hypertext transfer protocol
    ii) Flow control mechanism
    iii) Web Server

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEX	Pass Marks	32
Year / Part	III / II	Time	3 hrs.

Subject: - Computer Network *(CT657)*

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1. Explain the importance of layered architecture of computer networking. Explain the function of following devices in brief: [4+6]

   i)   Hub
   ii) Bridge
   iii) Router

2. A frame having size of 100 bits is transmitted through a channel having capacity of 200 KB/Sec. Calculate the percentage of idleness of the channel assuming the round trip time of the channel to be 20 ms. Is the channel efficient? What is your recommendation further? [5+1+4]

3. Explain HDLC with its frame format. Explain the fault tolerance mechanism of Fiber Distributed Data Interface. [4+4]

4. What are the mechanisms adapted for optimization of uses of IP address. Explain with your example the use of sub-netting showing network address, broadcast address and sub-net mask. [4+6]

5. What is socket? Explain connection management of TCP. [1+7]

6. What is the difference between POP and IMAP? Explain DNS servers and its query types. [3+5]

7. Why the world has decided to migrate to new internet addressing scheme IPV6? Which method do you suggest for the migration of IPv4 to IPv6 and why? [3+5]

8. What are the properties of secure communication? Encrypt and Decrypt "OIE" message using RSA algorithm. [3+7]

9. Write short notes on: (any two) [4×2]

   i)   Token Bucket algorithm
   ii) E_1 Telephone Hierarchy
   iii) Distance vector routing

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Exam.		Regular / Back	
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Subject: - Computer Network (CT657)

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1. What is Internetwork? What are the layer design issues? Explain about connection oriented and connection less service. [2+3+3]

2. Define transmission media. Why now a day all communication media like twisted pair, co-axial pair even wireless media are replaced by optical fibre? Justify your answer with necessary diagram, working principle and transmission mechanism. [8]

3. What is pure ALOHA and slotted ALOHA? Consider the delay of both at low load. Which one is less? Explain sliding window protocol. [3+2+3]

4. What is dynamic routing? Explain distance vector routing? What is count to infinity problem? [1+5+2]

5. Given the class C network of 204.15.5.0/24, subnet the network in order to create the network in Figure below with the host requirements shown. [8]

netA: 14 hosts   netD: 7 hosts
netC: 2 hosts
netB: 28 hosts   netE: 28 hosts
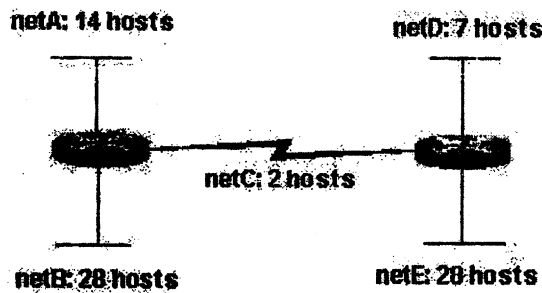
6. Describe connection establishment, data transfer and connection release in TCP protocol. [8]

7. What is the importance of DNS? Explain POP3 and IMAP in detail. [3+5]

8. Why IPV4 address is going to replace by IVP6 address? Is IPV6 address 2002::3A03::01:BFF5 valid address? Justify your answer. [8]

9. What is Digital Signature? Explain about any public key encryption algorithm with example. What security mechanism is used in transport layer? [2+4+2]

10. What is SSL? Explain the different types of firewall those can be implemented to secure the network. [2+6]

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1. Can we implement OSI model in any type of communication? Describe TCP/IP model with reference to OSI model. [2+6]

2. What is transmission media? Describe the following: [2+6]

   a) Twisted pair
   b) Co-axial
   c) Satellite

3. Explain different types of flow control mechanism in data link layer. [8]

4. What is link state routing? Describe the working process of OSPF with an example. [2+6]

5. A large number of consecutive IP addresses are available starting at 193.122.2.1. Suppose that four organizations Pulchok, Thapathali, WRC and ERC request 6000, 2000, 4000 and 2500 addresses respectively. Design the network and find the first valid IP address, last IP address and mask in w.x.y.z/s notation for each organization. [8]

6. "TCP uses a three way handshake to establish a connection". Justify. Explain how flow control is addressed by TCP. [4+4]

7. Describe the following algorithms [4+4]

   a) SMTP
   b) HTTPS

8. "IPv4 and IPv6 coexistence" what does this mean? Explain header translation approach with an appropriate figure. [4+4]

9. Explain RSA algorithm and describe it with example. [8]

10. What is SSL? How can SSL be used to secure http protocol? Explain. [2+6]

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Subject: - Computer Network (CT657)

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1. Why it is necessary to have network software's in layered architecture? Compare TCP/IP and OSI reference model. [3+5]

2. Compare the different types of transmitting media with appropriate figures. [8]

3. What are the differences between error control and flow control? Describe Cyclic Redundancy Check with example. [3+5]

4. What is routing? Explain about BGP protocol and clarify how routing works in the internet. [2+6]

5. A large number of consecutive IP addresses as are available at 202.70.64.0/19. Suppose that four organization A, B, C and D request 100, 500, 800 and 400 addresses respectively, how the subnetting can be performed so, that address wastage will be minimum? [8]

6. What is congestion control? Describe Token Bucket and Leaky Bucket algorithms. [2+6]

7. Explain the Mail transfer and Mail access protocol. Show how the email is transferred from one domain to another domain. Illustrate your answer with an appropriate figure. [3+5]

8. Describe Tunneling and Dual stack to transit from IPV4 to IPV6. [4+4]

9. What is encryption? How can Deffi Helamn algorithm be used to negotiate a shared key between the receiver and transmitter. Explain. [2+6]

10. What are the desirable properties of secure communication? Explain how wireless network can be secured. [3+5]

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1. Why are network software designed with layers stacked on top of one another? What are the factors to be considered while designing these layers and the interfaces in-between.   [2+6]

2. Explain different types of multiplexing used in communication system. Differentiate between circuit switching and packet switching.   [5+3]

3. What are the different methods of farming? Compare IEEE 802.3, 802.4 and 802.5 standards.   [3+5]

4. What are the major functions of network layer? Explain BGP in detail.   [3+5]

5. Design a network for the Institute of Engineering, Pulchowk campus having 5 departments having 45, 35, 40, 23 and 30 computers in their respective network by allocating public IP to each computer with minimum losses. Assume IP by yourself.   [8]

6. Why multiplexing is requirement in transport layer. Draw the segment structure of TCP and compare TCP with UDP.   [2+3+3]

7. What is HTTP? Explain the protocol with reference to the request and response header structure.   [2+6]

8. Draw the frame format of IPV6. Explain about tunnelling in IPV6.   [4+4]

9. Why network security is very important? Explain different types of firewall that can used to secure the network.   [2+6]

10. What are PGP and SSL? Encrypt the message "ATTACK" using RSA algorithm.   [2+2+4]

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INSTITUTE OF ENGINEERING

Examination Control Division

2068 Baishakh

Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Computer Network

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt *All* questions.
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1. What is a switching? Differentiate between packet switching and circuit switching. [2+6]

2. What are types of twisted pair cable? Calculate the efficiency of slotted Aloha. [4+4]

3. What is a virtual LAN? Design a network which consists of two VLAN named student and department. Explain with necessary diagram, IP addresses and configurations. [2+6]

4. What is a logical address? You are given the IP address block 200.10.80.32/25. If there are five departments which require 5, 40, 28, 12, 6 hosts respectively. Design the subnet. [2+6]

5. What are the functions of transport layer? Draw the segment structure of TCP. [3+5]

6. What is a fragmentation and re-assembly? Explain about any intra-AS routing protocol. [3+5]

7. What are the advantages of IPV6? The maximum payload segment is 65495 byte. Why was such strange number chosen? [4+4]

8. What is the function of proxy server? Explain about electronic mail. [3+5]

9. What is a secure socket layer? Encrypt the message "DANGER" using RSA algorithm. [2+6]

10. Compare x.25 and frame relay network. A bit string 011110111110111110 needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing? [6+2]

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Exam.		Regular/Back	
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Computer Networks

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1. Why network software should be in hierarchical form? Explain in detail about OSI layer. [3+5]

2. If you are assigned to design a LAN for Pulchowk Campus having 5 departments. Each department will have 100 computers locating in 5 rooms each equipped with 20 computers. Make your own justification while selecting connecting devices and accessories. [6+2]

3. What do you mean by ISDN and what is it contribution in the field of data communication? Explain various types of multiplexing mechanism used in communication. [3+5]

4. Describe what do you understand by switching along with various types of switching mechanism. Explain the fault tolerance mechanism of FDDI. [4+4]

5. Why access control of channel is essential? Compare operating details of IEEE 802.4 and IEEE 802.5. [2+6]

6. Explain along with the packet format about the virtual circuit connection of X.25. [4+4]

7. Why routing is essential in computer networking? Compare working of distance vector routing algorithm with link state routing algorithm. [2+6]

8. Explain in detail about IP frame format. [8]

9. If you need to assign IP addresses to all computers of question no. 2 making each department as network. What will be your approach? Explain with IP address ranges you are suggesting. [8]

10. How the protocol SMTP does operate? Explain the procedures to make your network secured. [3+5]

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Subject: - Computer Network

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1. Why are the network softwares defined with distinct layers stacked on top of one another? What are the factors to be considered when designing these layers?   [2+6]

2. Why do we need RAID in the computer networks? Define and discuss the differences between RAID 0, RAID 1 and RAID 5.   [2+6]

3. What is a telephone? With a simple diagram of a telephone network explain how the system works.   [2+6]

4. Why channel access mechanism is important in computer networking? Explain the operation of IEEE 802.5 with its frame format.   [3+7]

5. Differentiate: [2×5]

   a) Distance vector and link state routing algorithm
   b) Circuit switching and packet switching

6. What is X.25? Explain the format of X.25 packet in detail.   [3+5]

7. What are the differences between TCP and UDP services? Explain the TCP datagram format in detail.   [3+5]

8. Suppose there are 4 departments A, B, C and D. The department A has 23 hosts, B has 16, C has 28 and D has 13 hosts. You are given a networks 202.70.64.0/24. Perform the subnetting in such a way that the IP address wastage in each department are minimum and also find out the sunbet mask, network address, broadcast, and unable host range in each department.   [10]

9. Write short notes on: [2×5]

   a) Network Security
   b) Router and Gateway

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1. Define network and protocol for network. Explain peer-to-peer network process with example. [2+6]

2. Describe guided and unguided media used in computer network with their advantages. [8]

3. Explain the operation of pure ALOHA system. How CSMA/CD works? [4+4]

4. List the functions of Data Link Control Layer. Explain any two sliding window protocols with the advantages of piggybacking. [5+3]

5. Describe the policies that help in preventing the congestions within the network? Differentiate between leaky bucket and token bucket algorithm with their operation and working of token bucket. [4+6]

6. What do you understand by virtual circuit switching? Explain the X.25 virtual circuit switching. [2+6]

7. Explain the seven layers of OSI model with their example protocols. [8]

8. Briefly describe ICMP error and informational message types in IPv4 network infrastructure. [8]

9. How can we maintain the security within the communication network? Explain any one cryptography algorithm with example. [2+6]

10. Write short notes on (any two): [3+3]

    a) UDP and its application
    b) Network Devices: Hubs, Switches and Routers
    c) IPv4 Header Structure
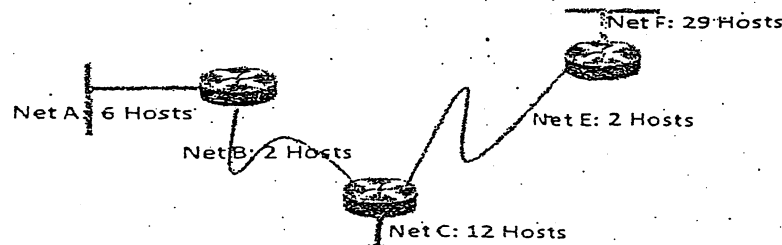
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1. a) Why do communication process within computer network is divided into layers? How the process of data encapsulation occurs in transmission mode described by seven layers of OSI model. Compare OSI model with TCP/IP model.   [2+2+4]

   b) What is client/server networking? Explain Active Networking model framework comparing with traditional legacy network.   [3+5]

2. a) What are the services provided by data link layer? Explain any one methods of framing and flow control.   [2+3+3]

   b) Calculate SNR and maximum channel capacity of a cat6 channel having bandwidth 300 MHz with 2mW and 200 µW as signal and noise power respectively.   [4+4]

3. a) Describe the 802.3 Ethernet standard for CSMA/CD and compare it with 802.4 token bus technology. Explain how DSSS technique is applied in wireless transmission.   [5+3]

   b) Differentiate between circuit switching and packet switching technology. Explain the operation how switched virtual circuit in frame relay network is established, maintained and teardown.   [2+6]

4. a) What is unicast and multicast routing? Describe the concept of optimality principle. Describe how the routers in its link state routing come into fully adjacency state.   [2+6]

   b) What are the factors that cause congestion within WAN? Propose your best traffic shaping approach to manage congestion in packet switched network.   [2+6]

5. a) Give the reason why the current world is moving to IPv6 addressing mechanism. Describe the IPv6 address types with its representation format. You are given the IPv4 address block 203.71.53.0/26; assign the IP subnet for the following network.   [2+2+6]

   b) Write short notes on (any two)   [3+3]

   i) TCP Sliding Window Protocol
   ii) Secrete Key Algorithm: DES
   iii) ISDN Signaling and ATM AAL
   iv) ICMP Message Types

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INSTITUTE OF ENGINEERING

Examination Control Division

2065 Shrawan

Exam.		Regular/Back	
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Computer Networks

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✓ Attempt **_All_** questions.
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1. Explain five instances of how networks are a part of your life today. Though we have MAC address, why we use IP address to represent the host in networks? Explain your answer. [5+3]

2. What are headers and trailers, and how do they get added and removed? Explain with appropriate figure. [5]

3. Explain the working principle of different types of network devices Repeater, HUB, Bridge, Switch, and Router. [10]

4. Both UDP and TCP use port numbers to identify the destination entity when delivering a message. Give two reasons for why these protocols invented a new abstract ID (port numbers), instead of using process IDs, which already existed when these protocols were designed. [3]

5. Why the telephone companies developed the ISDN? Explain the working principle of ISDN with its interface and the functional group. [2+8]

6. Suppose we have 4 departments A, B, C and D the department A has 23 hosts, B has 16, C has 28 and D has 13 hosts. You are given a network 202.70.91.0/24. Perform the subnetting in such a way that the IP address wastage in each department is minimum and find out the subnet mask, network address, broadcast, and usable host range in each department. [14]

7. When the congestion occur in the network? Explain the different approach of the congestion control algorithm. [3+7]

8. Explain the Major IP services in the computer networks? [10]

9. Explain the working principle of FTAM protocol. [10]

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1. What are the reasons for using layered protocols? Explain the layers of OSI Reference Model with appropriate figure. [2+8]

2. Why do we need the network servers? Explain briefly the different types of Network servers. [2+4]

3. Why we need RAID in the computer networks? Define and discuss the difference between RAID 0, RAID 1, and RAID 5. [2+6]

4. List two advantages and two disadvantages of having international standards for network protocols. Compare and explain the different types of transmitting media with appropriate figure? [3+8]

5. Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain your answer. [3]

6. Explain the working principle of FDDI with FDDI specifications, FDDI devices, and FDDI fault tolerance. [10]

7. Suppose the network 200.168.10.0/24 is subnetted to create 7 subnetworks and an IP address 200.168.10.177 is assigned to a host computer. Determine the subnet mask, network address, broadcast address, usable host range and in which subnet the given host lies. [10]

8. Explain the Datagram Format of IP V4 with the appropriate figure. What is the minimum header length of IP datagram format? [10 +2]

9. Explain the working principle of Message Handling System (MHS) X.4000 protocol. [10]

Subject: - Computer Networks

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1. Draw a diagram of OSI model and explain the network functions performed in layer 3 and layer 4.   [3+5]

2. List the indicated network hardware devices: one operating in layer 1, one in layer 2, one in layer 3 and other layer 4; and explain each of them.   [1+7]

3. Explain briefly the indicated transmission media: coaxial cable, line-of-sight, and satellite.   [8]

4. What is the fundamental difference between peer-to-peer priority and non-priority systems of communication protocols? Discuss briefly peer-to-peer priority protocols.   [2+6]

5. Explain and distinguish between Permanent Virtual Call and Virtual Call channel options of X.25 network. What are the purposes of LCGN and LCN fields of data packet header?   [5+3]

6. Suppose an IP address 202.70.91.145 is assigned to a network that is subnetted to create 6 subnetworks. Determine the subnet mask, network address and host address range for each subnetworks.   [8]

7. Differentiate between router, gateway and bridge. What are the functions of bridge and how is bridge table maintained?   [3+5]

8. What is the difference between static and dynamic routing? Explain the distance vector routing with appropriate example.   [3+5]

9. Explain encryption with private and public keys. Discuss with example, how monoalphabetic version of Caesar cipher works?   [4+4]

10. Write short notes on: [4×2]

    a) ISDN
    b) ALOHA

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Exam.	Regular / Back		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Computer Network

✓ 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.

1. Why computer network is important? Differentiate between physical and logical topology. [5+3]

2. Explain the ring and bus topologies in computer network and compare it. [5+3]

3. Write brief notes on network server and network workstation. [5]

4. What are the characteristics of IEEE token bus LAN standard? Explain. [8]

5. Explain in detail about X.25 data link layer and X.25 data packet header. [9]

6. Why do you need adaptive routing? Compare it with flooding. [4+3]

7. What do you mean by congestion control? List and discuss some congestion control algorithms. [2+6]

8. Write diagram of IP header and explain the purpose of Fragment Offset, Time to Live and Protocol fields. [4+4]

9. What do you mean by IP source routing? What is it's advantage? [4+2]

10. What type of protocol in UDP? Explain UDP header. [2+4]

11. What are the functions of Message Handling Systems (MHS)? Discuss briefly. What is difference between MHS and MTS? [5+2]

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1. Differentiate connection oriented and connection less services. Which type of service is provided by OSI network and transport layers? [4+2]

2. Write brief notes on network hardware devices, NIC and Hub. [6]

3. What do you mean by circuit switching and virtual circuit switching? Discuss application areas of packet switching. [4+2]

4. Discuss different interfaces of ISDN. [4]

5. Explain in detail about IEEE 802.3 physical layer and medium access sublayer. [3+4]

6. Discuss different devices involved in FDDI. [6]

7. Discuss physical and data link layer of X.25 network. Explain the format of data packet header in X.25. [5+4]

8. Explain distance vector routing algorithm with an example of your own. What are the problems with this approach? [5+2]

9. Explain and compare two traffic shaping methods for congestion control. [6]

10. Draw a diagram of IP datagram format and explain. What are minimum values of IHL (header length) and why? [3.5+1.5]

11. Discuss difference in requirements of InterAS routing and IntraAS routing. What is the routing algorithm used by BGP? Explain. [4+3]

12. Discuss components of X.400 Message Handling System with diagram. [6]

13. Discuss directory services with a model of a directory indicating DSP and DAP. [5]

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1. Draw a neat diagram showing OSI reference model. What are the typical services provided by data link layer and transport layer?   [3+4]

2. What are functions of network server and network workstation?   [4]

3. Write and explain CSMA/CD frame. What are the functions performed by Media-Access management entity in CSMA/CD layers.   [2+2]

4. Write brief notes on network transmission media; coaxial, fiber optic.   [6]

5. Explain processes involved in digital transmission using in PCM.   [4]

6. List and explain briefly peer to peer priority channel access methods. Discuss media access method in IEEE 802.5 standard.   [6+3]

7. Explain access method in pure ALOHA. Show that its maximum channel utilization is only 18%.   [4]

8. Discuss X.25 channel options with emphasis on PVC. Write and discuss octet 1 and octet 2 of non-data packet header.   [4+4]

9. Given a network   [6]
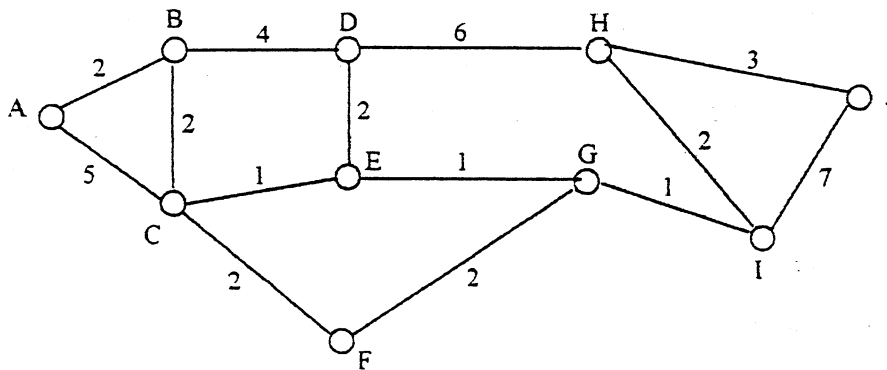
Where circles represent network nodes and values at the lines (links) between nodes represent cost of the links. Find shortest path from node A to node J using shortest path method (Dijkstra's algorithm)

10. Discuss IP address classes. In class B address if 7 bit subnetting is used, what is the subnet mask?   [6+2]

11. Discuss features of TCP. What is the significance of URG and PSH flags in TCP segment?   [4+3]

12. What is the purpose of FTAM? Discuss different attributes of FTAM.   [2+4]

13. What are the major security violations? Discuss Data Encryption Standard.   [2+5]

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Exam.		Regular / Back	
Level	B.E.	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Computer Network

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1a) Why layered architecture is preferred in computer communication? Illustrate OSI Reference Model and the functions of each layer. (3+6)

b) Explain how TDM be used to achieve circuit switching. Describe the transmission of packets using virtual circuit approaches. (3+4)

2a) Explain the operation of CDMA/CD with neat diagrams. Why cannot we use repeaters/hubs as many as we desire in the 802.3 networks? (6+3)

b) Why EIA 449 is preferred over EIA-232 in some applications? Describe the electrical, mechanical and functional specifications of EIA-449. (2+5)

3a) Explain the data link control mechanism in primary/secondary polling system. Describe how does stop-and-wait protocol work. (4+3)

b) Explain the operation of X.25. Describe the formats of data packets used to transmit user data in X.25 networks. (5+4)

4a) Explain how TCP ensures reliable data interchange despite the use of connectionless Internet protocol. What are the advantages of UDP over TCP? (6+3)

b) Why IEEE 802.4 standard is more suitable for real-time application than IEEE 802.3? Describe 802.4 frame formats and its logical ring maintenance. (2+5)

5a) Why frame relay is used as WAN technology nowadays? Explain the frame relay layers in detail. (3+4)

b) Discuss the components of SMTP. Explain how does electronic mail service using SMTP along with POP. (5+4)

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1a) What are the major transmission media used in computer networking? Explain their characteristics, uses, merits and demerits with neat diagram.   (2+6)

b) Suppose if there is heavy traffic on both 802.3 LAN and 802.5 LAN, a station on which system is more likely to wait longer to send a frame? Why? Give the detail explanation?   (2+6)

2a) Discuss the operation of the distance vector routing protocol. How does a link-state routing protocol operate?   (4+4)

b) What are the factors that determine whether computer network is LAN, MAN or WAN? Illustrate various types of network topologies.   (4+4)

3a) What are the differences between the OSI approach and the TCP/IP approach to the application layer in particular? Compare the X.400 protocol with SMTP.   (4+4)

b) State in which situations peer-to-peer network is preferred than client/server network. Show how does Network Interface Card play important role in internetworking. (3+5)

4a) What do you understand by TCP? Explain how TCP ensures reliable data interchange despite the use of connectionless Internet protocol.   (2+6)

b) Describe in detail one of the DTE-DCE interface standards specified by EIA. Which is more efficient circuit switching or virtual circuit switching and why?   (5+3)

5a) Explain how can you compare X.25 layers with those of the OSI model. What kind of virtual circuits does X.25 use?   (5+3)

b) Explain what are the main functions of Media Access Control Sublayer. What is difference between the physical and logical addresses?   (5+3)