2072 Kartik

1. You are assigned to design a network infrastructure for a 3-star hotel. Recommend a network solution with hardware and software in current trend that can be used in the hotel. Make necessary assumptions and justify your recommendation with logical arguments where possible. [8]
2. List out the function of physical layer in TCT/IP reference model. Explain different types of transmission media. [2+6]
3. What are the function of data-link layer? Explain the channel allocation problem with example. [3+5]
4. What are the functions of network layer? Explain briefly about multicast routing protocols and unicast routing protocols.[2+6]
5. Network layer is one of the key layers in OSI reference model, why? Differentiate between distance vector routing and static link routing. [2+6]
6. What is a TCP connection? Explain how a TCP connection can be gracefully terminated? [2+6]
7. What are the different components of email server? Explain different types of electronic mail sending and accessing protocol. [2+6]
8. What is IPV6? What methods are used so that IPV6 and IPV4 networks are interoperable? [2+6]
9. What is firewall? What are their types? Encrypt and decrypt "OVEL" message using RSA algorithm. [1+1+6]
10. Write short notes on: [4*2]
    1. Digital signature
    2. IPSec

2071 Shrawan

1. What is computer network? Distinguish between OSI and TCP/IP reference model. [2+6]
2. What is transmission media? Explain about any three transmission media in detail. [2+6]
3. What are the major function of data link layer? Explain about framing in detail. [3+5]
4. What is routing? Differentiate between link state routing and distance vector routing. [2+6]
5. Write short notes on: (any two) [4+4]
    1. ARP
    2. ICMP
    3. IP
6. Distinguish between TCP and UDP. How is TCP connection established? Explain. [3+5]
7. SMTP is a text based protocol and uses 7 bit ascii. How can this be used to transmit sometimes like images? Explain. [8]
8. What are the drawbacks in IPV4? Which of these drawbacks do IPV6 solve? Explain [2+6]
9. What is cryptography? Differentiate between symmetric key and public key cryptography. [2+6]
10. Write short notes on: (any two) [4*2]
    1. WEP
    2. IDS
    3. SSL

2070 Chaitra

1. What are the features of Client/Server architecture? What are headers and trailers and how do they get added and removed? Explain. [4+4]
2. What do you mean by data switching? Explain about various types of switching with practical implementation example. [8]
3. What is difference between Error correcting and Error detection process? A bit string 01111011111011111110 needs to be transmitted at the data link layer. What is string actually transmitted after bit stuffing, if flag patterns is 011111110. [5+3]
4. Explain the working principle of different types of network devices: Repeater, HUB, Bridge, Switch and Router. [8]
5. How can you dedicate 10, 12, 8, 14 public IP address to department A, B, C, D respectively from the pool of class C with minimum losses of IP? Explain [8]
6. Explain the UPP segment structure. Illustrate your answer with appropriate figures. [8]
7. What do you mean by email server? What are the protocols used on it? [2+6]
8. Explain the IPV6 datagram format with appropriate figures. [8]
9. Explain briefly how firewalls protect network and also explain different types of firewall. Illustrate your answer with appropriate figures. [8]
10. What do you mean by Network security? Explain the operation of Data Encryption Standard Algorithm. [3+5]

2070 Ashadh

1. What do you mean by protocol and interface? Write the protocols used in each layer of TCP/IP model. [4+4]
2. How do you define network topology? Discuss the types of network topologies based on its size and geographical distribution. [3+5]
3. What are the functions of LLC and MAC sub-layer? Discuss different farming approaches used in data link layer. [2+2+6]
4. How data transfer occurs in Ethernet network? Explain. [6]
5. Discuss how CSMA works? Differentiate it with CSMA-CD. Explain the optical fiber cabling standards with examples. [2+2+4]
6. What is virus circuit switching? Describe the operation of Frame-Relay network. [2+6]
7. Differentiate between adaptive and non-adaptive routing. Explain shortest path finding algorithm in link state routing. [3+5]

8. Compare between leaky bucket and token bucket algorithm with the operation how token bucket works. [3+5]
9. What are the major problems with existing IPV4 network? Explain IPV4 addressing and sub-netting with example. [4+4]
10. Write short notes on: [4+4]
    - ALOHA system
    - TCP header

2069 Chaitra

1. Explain the need of Networking Software in the form of Hierarchy? Mention in which level layer of OSI reference model following tasks are done. [6+2]
    1. Timing and voltage of received signal
    2. Encryption and decryption of data
    3. Data framing
    4. Point-to-point connection of socket
2. Define switching and multiplexing. Differentiate between circuit switching and packet switching. [4+4]
3. Explain different types of Data link layer framing mechanisms. [8]
4. What is the contribution of sub-netting in IP address management? Show the importance in this case. Banijya bank need to allocate 15 Ips in HR department, 30 in finance department, 24 in customer care unit and 25 in ATM machines. If you have one network of class C range public IP address. Describe how you will manage it. [8]
5. Why is routing protocol necessary? Explain the working process of Routing Information Protocol (RIP) with example. [3+5]
6. Why do you think that there exist two protocols in transport layer where as there exists only one protocol in Internet layer in TCP/IP reference model. Explain token bucket algorithm for congestion control. [5+3]
7. What is HTTP protocol? With an example explain how a request inititated by a HTTP client is served by a HTTP server. [2+6]
8. Explain the IPv6 datagram format and the function of each field with necessary figure. [8]
9. Compare symmetric key encryption method with asymmetric key encryption. Describe the operation of RSA alogrithm. [4+4]
10. What is network security? How can firewalls enhance network security? Explain how firewalls can protect a system. [2+2+4]

2068 Chaitra

1. Why are the network software 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 network? 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 account mechanism is important in computer networking? Explain the operation of IEEE 802.5 with its frame format. [3+7]
5. Differentiate: [2*5]
    1. Distance vector and link state routing algorithm
    2. 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 subnet mask, network address, broadcast, and unable host range in each department. [10]
9. Write short notes on: [2*5]
    1. Network Security
    2. Router and Gateway

2068 Baisakh

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 requires 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? Ecnrypt the message “DANGER” using RSA algorithm. [2+6]
10. Compare x.25 and frame relay network. A bit string 01111011111101111110 needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing? [6+2]

2067 Ashadh

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.
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 operate? Explain the procedures to make your network secured. [3+3]