

- (b) What is frequency division multiplexing ? Give the advantages and disadvantages of frequency division multiplexing. 5
- (c) What are gateways ? Explain the importance of gateways in networking. 5
- (d) Explain the working of ARP (Address Resolution Protocol) with the help of a suitable diagram. 5
- (e) Justify the statement, “Slotted ALOHA achieves double efficiency than pure ALOHA.” 5
- (f) Differentiate between ‘Public-key’ and ‘Private-key’ cryptography. 5

- (g) Explain count to infinity problem with the help of an example. 5
- (h) Define angle modulation. Give its types. Also, discuss the limitation of angle modulation. 5
2. (a) Assume message $M = 1010101010$ bits and generator $G = 10001$ bits. Explain, how CRC (Cyclic Redundancy Check) is used for error detection using the given message bits and generator bits. 10
- (b) Discuss distance vector routing using a subnet topology. Also, discuss the different metrics used in distance vector routing algorithm. 10
3. (a) What is MD5 ? Write and explain the steps of MD5 algorithm. 10

- (b) Write the role of data link layer in OSI model. Explain the services and functions provided by data link layer. Also, give the importance of its sub-layers. 10
4. (a) Explain X.25 architecture with the help of a suitable diagram. How does X.25 architecture differ from frame relay ? Give the advantages of frame relay over X.25 architecture. 10
- (b) Differentiate between IPv4 and IPv6. Also, discuss the need of IPv6. Find the classes of the following IPv4 addresses : 10
- (i) 193.14.56.22
 - (ii) 226.11.14.27
 - (iii) 134.11.27.13
 - (iv) 252.5.15.111

5. Write short notes on the following : $4 \times 5 = 20$

- (i) Leaky Bucket Algorithm
- (ii) Multimode Optical Fiber
- (iii) OSI Model
- (iv) CSMA/CD

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