



- (b) Multiplexing  
(c) Microplexing  
(d) Duplexing
- 1-d. Guard bands are used for \_\_\_\_ (CO2) 1  
(a) WDM  
(b) FDM  
(c) TDM  
(d) CDM
- 1-e. In the \_\_\_\_ Protocol, the sender sends its frames one after another with no regard to the receiver. (CO3) 1  
(a) Simplest  
(b) Selective-Repeat ARQ  
(c) Stop-and-Wait  
(d) Go-Back-N ARQ
- 1-f. The checksum is used for \_\_\_\_\_. (CO3) 1  
(a) data recovery  
(b) data transfer  
(c) error detection  
(d) error recovery
- 1-g. Transport layer aggregates data from different applications into a single stream before passing it to: (CO4) 1  
(a) data link layer  
(b) application layer  
(c) physical layer  
(d) network layer
- 1-h. Routing tables of a router keeps track of: (CO4) 1  
(a) MAC Address Assignments  
(b) Port Assignments to network devices  
(c) Distribute IP address to network devices  
(d) Routes to use for forwarding data to its destination
- 1-i. Which is not an application layer protocol? (CO5) 1  
(a) HTTP  
(b) SMTP

(c) FTP

(d) TCP

- 1-j. Application layer offers \_\_\_\_\_ service.(CO5) 1
- (a) End to end
  - (b) Process to process
  - (c) Node to Node
  - (d) Host to host

**2. Attempt all parts:-**

- 2.a. What is Router? (CO1) 2
- 2.b. Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference? (CO2) 2
- 2.c. What is the significance of redundant bit? (CO3) 2
- 2.d. Define Masking? (CO4) 2
- 2.e. Define HTTP. (CO5) 2

**SECTION B**

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**3. Answer any five of the following:-**

- 3-a. What is the need for Layered Architecture? (CO1) 6
- 3-b. Explain the need of IEEE standards and enlist some IEEE standards used in computer networks.(CO1) 6
- 3-c. Define Go-back-N ARQ. (CO2) 6
- 3-d. Explain the importance of asynchronous TDM.(CO2) 6
- 3.e. Why we use multiple access protocols? (CO3) 6
- 3.g. What are the function of application gateway in firewalls?(CO5) 6
- 3.f. What is meant by Encapsulation and de capsulation?(CO4) 6

**SECTION C**

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**4. Answer any one of the following:-**

- 4-a. Explain all the types of network topology with its merits and demerits. (CO1) 10
- 4-b. Why do we need networking? Explain the components of computer networks. (CO1) 10

**5. Answer any one of the following:-**

- 5-a. Explain the working of WDM. (CO2) 10
- 5-b. Explain spread spectrum techniques. (CO2) 10

**6. Answer any one of the following:-**

- 6-a. Explain any two data link protocols used for noisy channel with help of diagrams.(CO3) 10
- 6-b. Differentiate between FDMA, TDMA and CDMA channelization protocols. (CO3) 10

**7. Answer any one of the following:-**

- 7-a. Explain the Process-to-Process delivery on transport layer protocol. (CO4) 10
- 7-b. Explain the window management for the transport layer. (CO4) 10

**8. Answer any one of the following:-**

- 8-a. Explain the architecture and services of e-mailing system. (CO5) 10
- 8-b. Explain about Application layer and its services in detail? (CO5) 10

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