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21CS52

## Fifth Semester B.E. Degree Examination, June/July 2024 Computer Networks

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. With a neat sketch, explain two types of wide area network in use. (04 Marks)
- b. Explain the functionalities of OSI reference model layers with neat diagram. (08 Marks)
- c. Explain the following:
  - i) Direct sequence spread spectrum and frequency hopping spread spectrum.
  - ii) Fiber optics and copper wire. (08 Marks)

OR

- 2 a. List out 6 different types of services provided under connection-oriented and connection less services. (04 Marks)
- b. Explain TCP/IP protocol suite of computer network with a neat diagram. Also represent the protocols used in each layer of the model. (08 Marks)
- c. What is path loss? Explain different types of frequency bands in radio transmission with necessary diagram. (08 Marks)

### Module-2

- 3 a. Write the steps for computing CRC. Find the codeword for the message frame 1101011111 and generator polynomial  $G(x) = x^4 + x + 1$  using CRC. (08 Marks)
- b. With a neat diagram, demonstrate the working of GO-BACK-N protocol. (08 Marks)
- c. Describe pure ALOHA and slotted ALOHA. (04 Marks)

OR

- 4 a. Explain error detection and correction using hamming code with 7 databits and 4 check bits. (08 Marks)
- b. Explain the working of stop and wait protocol for a noiseless channel. (08 Marks)
- c. With a neat diagram, explain the working of CSMA/CD protocol. (04 Marks)

### Module-3

- 5 a. Explain the routing process within datagram network and virtual circuit network with a neat diagram. (08 Marks)
- b. Explain distance vector routing algorithm with an example. (08 Marks)
- c. Bring out the Leaky Bucket mechanism for traffic policing. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain different types of packet scheduling algorithm with neat diagrams. (08 Marks)  
 b. Write the Dijkstra's algorithm and apply it to the following graph (Refer Fig.Q.6(b)) with source node 'u' to find shortest path to all other nodes.

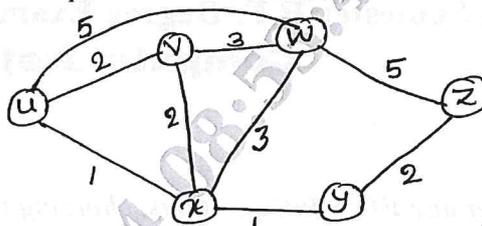


Fig.Q.6(b)

- c. Describe two major differences between the ECN and RED method of congestion avoidance. (08 Marks)  
 (04 Marks)

**Module-4**

- 7 a. List and explain the primitives for a simple transport service. (06 Marks)  
 b. Explain connection establishment between server and the client using TCP. (08 Marks)  
 c. With general format, explain the various fields of UDP and explain how checksum is calculated. (06 Marks)

OR

- 8 a. With a neat diagram, explain each field of TCP header. (08 Marks)  
 b. Write a note on Max-Min fairness. (06 Marks)  
 c. Explain the steps in making a remote procedure call with a neat diagram. (06 Marks)

**Module-5**

- 9 a. What are the 2 different architectures used in modern network application? Explain each architecture with neat diagram. (08 Marks)  
 b. Explain the HTTP request message format in detail. (08 Marks)  
 c. Explain the use of cookie in web application. (04 Marks)

OR

- 10 a. Illustrate the socket communication between two processes that communicate over the internet with a suitable diagram. (04 Marks)  
 b. With a neat diagram, explain how SMTP can be used for transmitting mails from sender to receiver. (08 Marks)  
 c. Explain the various services provided by DNS and problems associated with centralized design. (08 Marks)

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