211ITOSP

DEPARTMENT OF INFORMATION TECHNOLOGY, NITK SURATHKAL

END-SEMESTER EXAMINATION, JANUARY 2023

IT200 COMPUTER COMMUNICATION AND NETWORKING

Class: III SEM BTECH **Time: 3 Hrs.**

Date: 23/01/2023 **Marks: 100**

Register No.

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NOTE: 1. Answer all questions

2. Write necessary diagrams

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1. (a) Compare the OSI/ISO reference model with TCP/IP model. **[5 Marks]**

   (b) Define framing. Explain the role of character stuffing and bit stuffing with an example. **[5 Marks]**

2. With an example , explain how Selective repeat is advantageous over Go-Back N ARQ protocol. **[10 Marks]**

3. (a) Describe the working of IEEE 802.5 Token Ring protocol. Compare the same with IEEE 802.3 Ethernet Protocol. **[05 Marks]**

   (b) Describe the advantages and disadvantages of ALOHA and Slotted ALOHA Medium Access Control protocols. **[05 Marks]**

4. What is congestion control? Explain how congestion control is handled in the network layer and transport layer. **[10 Marks]**

5. Why is CSMA/CD not suitable for wireless communication? Explain in detail how CSMA/CA avoids data packet collisions in wireless networks. **[10 Marks]**

6. (a) Compute hamming code for following data and mention the data to be transmitted from source to destination. Data: 1 0 1 0 1 1 0 1 1 0 1 **[05 Marks]**

   (b) Assume that system S1 and system S2 use CRC for error detection and correction. Consider C(x) as x^5+x^3+x+1. Calculate the CRC for the given data at sender S1 for transmission. Data: 1 1 0 1 1 0 1 **[05 Marks]**

7. Define Routing. Consider that routers are connected as shown in figure 1. Compute the routing table for Router A, according to Distance Vector Algorithm. Show necessary steps of the computation. **[10 Marks]**

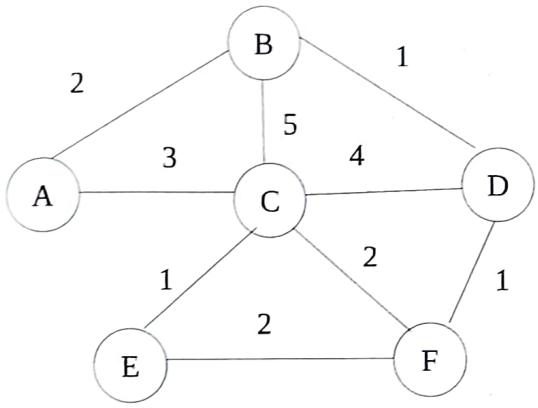

Figure 1

8. (a) A source S and destination D are connected via a router R. The network of source S can handle 520 bytes including 20 bytes of network layer header. The network of the destination can handle only 200 bytes in the network layer including header size. Show the fragmentation process at router R, by mentioning flags, offset and size of packet.

[05 Marks]

(b) Explain the header format of TCP in the transport layer. **[05 Marks]**

9. Consider that a company would like to use the network 194.57.7.0/24 and divide the network into 4 Subnets internally. Mention the network address, First host, last host and broadcast address for all four Subnets. Show the necessary calculations. **[10 Marks]**

10. (a) Describe how leaky bucket and token bucket algorithms regulate data flow in the network. **[05 Marks]**

(b) Describe with an example how Address Resolution Protocol works. **[05 Marks]**