

CBCS SCHEME

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Second Semester MCA Degree Examination, Dec.2019/Jan.2020

Computer Networks

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Describe application programmer, network operator and network designer with an example. (06 Marks)
- b. Explain circuit switched and packet switched networks with a neat diagram. (06 Marks)
- c. Discuss layered network system with help of a neat diagram. (08 Marks)

OR

- 2 a. Explain OSI network architecture with a neat diagram. (10 Marks)
- b. Consider a point-to-point link 4 km in length. At what bandwidth would propagation delay (at a speed of 2×10^8 m/s) equal transmit delay for 100-byte packets? (04 Marks)
- c. Explain the following ideas : (i) Encapsulation (ii) Multiplexing and demultiplexing (iii) API (sockets) (06 Marks)

Module-2

- 3 a. Discuss different types of classes of links that exist and their general properties. (06 Marks)
- b. Show the NRZ, Manchester and NRZI encoding for the pattern given. Assume that NRZI signal starts out low. 1 0 0 1 1 1 1 1 0 0 0 1 0 0 0 1. (06 Marks)
- c. Briefly explain Byte-oriented and Bit-oriented protocols. (08 Marks)

OR

- 4 a. Explain sliding window algorithm with a diagram. (06 Marks)
- b. Suppose we want to transmit the message 11100011 and protect it from errors using the CRC polynomial $x^3 + 1$.
(i) Use polynomial long division method to determine the message to be transmitted.
(ii) Suppose the left most bit is inverted due to noise on the transmission link. What is the result of receivers CRC calculation. How does receiver know that an error has occurred? (10 Marks)
- c. Discuss briefly about Wi-Fi and Bluetooth. (04 Marks)

Module-3

- 5 a. With an example network, explain datagram forwarding (table) and datagram networks characteristics. (10 Marks)
- b. Define virtual circuit identifier? Explain virtual circuit network and VC table entry for switches with a neat diagram. (10 Marks)

OR

- 6 a. With a neat diagram, explain IPv4 packet header format. (08 Marks)
- b. Explain the following protocols briefly:
(i) ARP (ii) ICMP (iii) DHCP (06 Marks)
- c. Briefly discuss about : (i) Distance vector (RIP) (ii) Border Gateway protocol. (06 Marks)

Module-4

- 7 a. With a neat diagram, explain UDP header format. (08 Marks)
b. Explain three-way handshake used by TCP to establish and terminate a connection. (06 Marks)
c. Discuss FIFO and Fair Queuing mechanisms in Queuing disciplines. (06 Marks)

OR

- 8 a. Explain TCP header format with a neat diagram. (08 Marks)
b. Briefly describe the mechanisms used for TCP congestion control. (08 Marks)
c. List and explain congestion avoidance mechanisms in brief. (04 Marks)

Module-5

- 9 a. Explain the following cryptographic building blocks : (i) Symmetric – key ciphers (10 Marks)
(ii) Public-key ciphers (iii) Authenticators (06 Marks)
b. Differentiate between session keys and pre distributed keys. (06 Marks)
c. Define firewall. Explain its strength and weaknesses. (04 Marks)

OR

- 10 a. Define DNS. Explain Domain Name service with example in detail. (10 Marks)
b. Explain the following protocols: (10 Marks)
(i) SMTP (ii) HTTP (iii) SNMP (iv) SOAP.
