Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 71686

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Fourth/Fifth/Sixth/Seventh/Eighth Semester

Computer Science and Engineering

CS 6551 — COMPUTER NETWORKS

(Common to Biomedical Engineering, Electronics and Communication Engineering, Mechatronics Engineering, and Information Technology)

(Regulation 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between packet switched and circuit switched networks.

2. What is meant by bit stuffing? Give an example.

3. State the functions of bridges.

4. When is ICMP redirect message used?

5. How do routers differentiate the incoming unicast, multicast and broadcast IP packets.

6. Why is IPV4 to IPV6 transition required?

7. List the advantages of connection oriented services over connectionless services.

8. How do fast retransmit mechanism of TCP works?

9. State the usage of conditional get in HTTP.

10. Present the information contained in a DNS resource record.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain the challenges faced in building a network.   (10)

        (ii) Obtain the 4-bit CRC code for the data bit sequence 10011011100 using the polynomial $x^4 + x^2 + 1$.   (3)

Or

(b) (i) With a protocol graph, explain the architecture of internet. (7)

(ii) Consider a bus LAN with a number of equally spaced stations with a data rate of 9 Mbps and a bus length of 1 km. What is the mean time to send a frame of 500 bits to another station, measured from the beginning of transmission to the end of reception? Assume a propagation speed of 150 m/s. If two stations begin to monitor and transmit at the same time, how long does it need to wait before an interference is noticed? (6)

12. (a) (i) Discuss the working of CSMA/CD protocol. (6)

(ii) Explain the functions of MAC layer present in IEEE 802.11 with necessary diagrams. (7)

Or

(b) (i) Consider sending a 3500-byte datagram that has arrived at a router R_1 that needs to be sent over a link that has an MTU size of 1000 bytes to R_2. Then it has to traverse a link with an MTU of 600 bytes. Let the identification number of the original datagram be 465. How many fragments are delivered at the destination ? Show the parameters associated with each of these fragments. (6)

(ii) Explain the working of DHCP protocol with its header format. (7)

13. (a) Explain in detail the operation of OSPF protocol by considering a suitable network. (13)

Or

(b) Explain the working of Protocol Independent Multi-cast (PIM) in detail. (13)

14. (a) (i) Explain the adaptive flow control and retransmission techniques used in TCP. (8)

(ii) With TCPs slow start and AIMD for congestion control, show how the window size will vary for a transmission where every 5th packet is lost. Assume an advertised window size of 50 MSS. (5)

Or

(b) (i) Explain congestion avoidance using random early detection in transport layer with an example. (7)

(ii) Explain the differentiate services operation of QOS in detail. (6)

15. (a) (i) Describe how SMTP transfers message from one host to another with suitable illustration. (6)

(ii) Explain IMAP with its state transition diagram. (7)

Or

(b) (i) List the elements of network management and explain the operation of SNMP protocol in detail. (8)

(ii) Discuss the functions performed by of DNS. Give example. (5)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Draw the format of TCP packet leader and explain each of its field. (10)

(ii) Specify the justification for having variable field lengths for the fields in the TCP header. (5)

Or

(b) Illustrate the sequence of events and the respective protocols involved while accessing a web page from a machine when it is connected with internet for first time. (15)