53 (CS 402) CPNW

2018

COMPUTER NETWORKS

Paper : CS 402

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* With a necessary diagram correlate the TCP/IP model with the OSI reference model. 10

   (b) Compare and contrast a circuit-switched network with a packet-switched network. 6

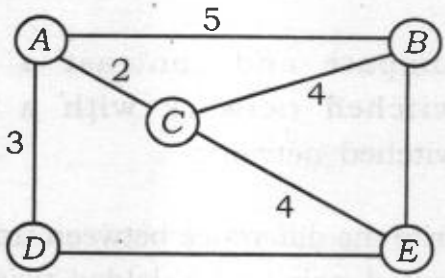
   (c) Write the difference between unshielded twisted pair and shielded twisted pair cables. 4

2. *(a)* A bit stream 1101011111 is transmitted using the standard CRC. The generator polynomial is $x^4 + x + 1$. Show the actual bit stream transmitted. Suppose the third bit from the left is inverted during transmission. Show that the error is detected at the receiver's end. 8

(b) How channel throughput is doubled in slotted ALOHA in comparison to pure ALOHA ? 7

(c) A stop and wait protocol use 100 *kbps* link, which have the round trip propagation delay 250*ms*. Find out the percentage of time the sender is blocked for acknowledgement if the frame size is 1000 bits. 5

3. *(a)* Consider the following topology.



Use link state routing algorithm to

(i) find the shortest path tree for each node.

(ii) find out the routing table for each node.

5+5=10

(b) Write a detailed note on the various congestion control algorithms used in the network layer. 10

4. (a) What do you understand by 'three way hand shake' ? Explain TCP segment header. Differentiate between TCP and UDP protocols. 4+8+2=14

(b) "In classful addressing a large number of addresses are wasted". Why ? How these wastage of addressing can be avoided in classless addressing ?

2+4=6

5. (a) An organization is granted the block 130.56.0.0/16. The administrator wants to create 1024 subnets.

2·5×4=10

(i) Find the subnet mask

(ii) Find the number of addresses in each subnet.

(iii) Find the first and last addresses in subnet 1

(iv) Find the first and last addresses in subnet 1024.

(b) Explain the role of SMTP, POP3 and IMAP protocols in electronic mail transfer. 10

6. (a) What is DNS ? What are PQDN and FQDN ? How does DNS work ? 2+4+4=10

(b) Discuss the relative merits and demerits of point-to-point, transient and stub links. 6

(c) How does CSMA/CD improve the performance of CSMA ? 4

7. Write short notes on the following : ***(any four)*** 5×4=20

(i) NAT

(ii) Bit stuffing and byte stuffing

(iii) Go Back N protocol

(iv) Network topologies

(v) SNMP

(vi) Virtual circuit *vs.* datagram circuit.