53 (IT 403) CMNW

2014

COMPUTER NETWORKS

Paper : IT 403

Full Marks : 100

Pass Marks : 30

Time : Three hours

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

*Answer **any five (5)** questions out of eight (8).*

1. *(a)* What are the various data link layer design issues ? Explain Stop-and-Wait ARQ protocol with suitable diagram when

   (i) Frame is lost

   (ii) ACK is lost. 4+6

   (b) Which of the OSI layer handles each of the following functions ? Describe them briefly

   (i) Framming

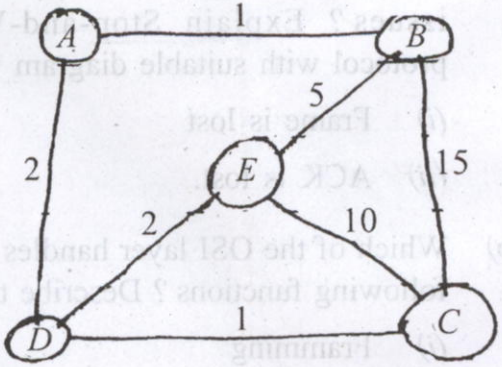
   (ii) Routing. 2+8

2. *(a)* What do you mean by multiple access communication ? What is the role of MAC layer protocols ? 3+3

(b) Why CSMA/CD protocol is not applicable in WLAN ? Latest version of Ethernet do not use CSMA/CD protocol. — Why ? 3+3

(c) What is hamming code ? Find out the code word for the user data 1001101 2+6

3. *(a)* Consider the network shown below and assume that each node initially knows the costs to each of its neighbours. Consider the distance vector algorithm and show the distance table entries at node *E*. 4+4



(b) A 1*km* long, 10*Mbps* CSMA/CD LAN (not 802·3) has a propagation speed 200*m/sec*. Data frames are 256 *bit* long, including 32 *bits* of header, checksum and other overhead. The first *bit* slot after a successful transmission is reserved for the receiver to capture the channel to send a 32 *bit* acknowledgement frame. What is the effective data rate, excluding overhead, assuming that there are no collisions ? 6

(c) What is count-to-infinity problem ? How is it addressed in link state routing ? 2+4

4. (a) Suppose your institution has a class B ip address 150.193.0.0 for your Physical network, you need at least 50 subnets interconnected with routers. Each of the subnet needs to be able to handle at least 750 hosts (workstations, servers and router interfaces). For the first 5 of these subnets give : 5×2

(i) Network address

(ii) Subnet Mark

(iii) Subnet address

(iv) Range of possible host ip addresses

(v) broadcast address.

(b) How a NAT enabled ISP, can assign more address than actual address ? 5

(c) Can the value of the header lengths in an IP Packet be less than 5 ? When is it exactly 5 ? 2+3

5. (a) What are the deficiencies of IPV4 ? How IPV6 was modified to overcome this deficiencies ? What are the advantages of using IPV6 ? 2+3+3

(b) How does checksum checker know that the received data unit is undamaged ? How CRC is superior to the parity check? 4+2

(c) What is ARP and RARP protocol ? What is an ARP Cache ? 4+2

6. (a) What do you understand by "three way handshake" ? Explain TCP segment header. Differentiate between TCP and UDP protocols. 2+4+4

(b) A window holds bytes 2001 to 6000. The next byte to be sent is 3001. Draw a figure to show the situation of the window after the following two events.

(i) An ACK segment with the acknowledgement number 3500 and window size advertisement is 4000 received.

(ii) A segment carrying 1500 *bytes* is sent. 3+3

(c) What are carrier extension and frame bursting in gigabit ethernet ? 2+2

7. (a) What is the advantage of traffic shapping ? Describe the token bucket algorithm. What is the difference between token bucket and leaky bucket algorithm ? 2+4+4

(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

(c) Explain the differences between HTTP and HTTPS. 4

8. *(a)* What is DNS ? What is the primary purpose of DNS ? 2+3

(b) Differentiate the following : ***(any three)*** 3×5

(i) Selective repeat ARQ and Go back N ARQ

(ii) Fast Ethernet and gigabit Ethernet

(iii) SMTP and MIME

(iv) Flow control and Error control

(v) bit stuffing and byte stuffing.
