53 (CS 402) CPNT

2012 C
2013
(May)

COMPUTER NETWORKS

Paper : CS 402

Full Marks : 100

Pass Marks : 30

Time : Three hours

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

Answer ***any five*** *questions out of Eight questions.*

1. *(a)* Which of the OSI layer handles each of the following functions ? Describe them briefly. 4+4

   (i) Framing *(ii)* Routing

   (b) Explain different network topologies with their merits and demerits. What are the basic role of topologies in Computer Networking ? Which network topology is widely used and why ? 8+2+2

2. *(a)* How channel throughput is doubled in slotted ALOHA in comparison to pure ALOHA ? 6

(b) 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 Acknowledgment, if the frame size is 1000 *bits*. 4

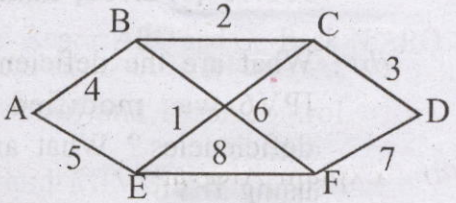
(c) How a bridge is different from a Hub ? What are the advantages and disadvantages of each ? Explain with reason, whether an LAN can be extended to any six or not, by increasing the number of Repeater. 4+4+2

3. *(a)* Explain ARP and RARP Protocol. What is an ARP Cache ? 4+2

(b) Compare and Contrast Circuit, Message and Packet Switching techniques with the help of neat sketch. 6

(c) What are the relative merits and demerits of single mode fiber in comparison to multimode fiber ? Describe the structure and composition difference between them. 4+4

4. *(a)* What is count-to-infinity problem ? How is it addressed in link state routing protocol ? For the following subnet, distance vector routing is used and the vectors that have just come into router C : from B : (5, 0, 8, 12, 6, 2) : from D : (16, 12, 6, 0, 9, 10) and from E : (7, 6, 3, 9, 0, 4). The measured delays to B, D and E are 6, 3 and 5 respectively. What is C's new routing table ? Give both the outgoing line to use and expected delay 3+4+4



(b) How CSMA/CD improves the performance of CSMA ? 4

(c) Is CIDR network Prefixes visible outside the IP network ? Justify your answer with an example. 2+3

5. *(a)* What do you understand by 'three way handshake' ? Explain TCP segment header. Differentiate between TCP and UDP Protocols. 4+6+4

(b) What is the total delay (latency) for the frame size 10 *million* bits that is being set upon the link with 15 routers with each having $2\mu s$ queuing time and a processing time $1\mu s$. The length is $300km$. The speed of light is $2\times10^8\ m/s$. The link has bandwidth 6 *Mbps*. 6

6. (a) What are the network number, subnet number and host number for the address 135.104.192.100, mark 255.255.128.0. 6

(b) What are the deficiencies of IPV4 ? How IPV6 was modified to overcome these deficiencies ? What are the advantages of using IPV6 ? 4+4+2

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

7. (a) What is Hamming Code ? Find out the Code word for the user data 1001101. 2+4

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

(c) "In classful addressing a large number of addresses are wasted". Why ? How these wastage of addressing can be avoided in classless addressing ? 2+4

8. (a) Explain with the help of neat diagram the basic and extended frame associated with HDLC Protocol. Also mention control fields and subfields of *each* case. 5

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

(i) Selective Repeat ARQ and Go-Back-N ARQ

(ii) Flow control and Error control

(iii) SMTP and MIME

(iv) Fast Ethernet and Gigabit Ethernet

(v) Bit Stuffing and Byte Stuffing.