Total No. of Questions : 10]

SEAT No. :

P3954

[Total No. of Pages : 4

[5253] - 541
T.E. (Computer Engg.)
COMPUTER NETWORKS
(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Calculator is allowed.***
4) ***Assume Suitable data if necessary.***

Q1) a) Differentiate between OSI and TCP/IP reference model. **[4]**

b) Represent 101011100 using Manchester and differential Manchester line coding technique. **[4]**

c) Draw flowchart of CSMA/CA. **[2]**

OR

Q2) a) Explain in brief: FHSS and DSSS. **[6]**

b) Explain fiber optic modes of propagation. **[4]**

Q3) a) Explain control field of HDLC w.r.t I-frame, S-frame and U-frame. **[6]**

b) A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (All stations together) produces **[4]**

i) 1000 frames per second

ii) 500 frames per second

OR

Q4) a) Explain selective repeat ARQ in detail. **[5]**

b) A bit stream 1001101 is transmitted using an hamming code. Show the actual bit string transmitted. Suppose 7^{th} bit from left is inverted during transmission, show that this error is detected and corrected at the receiver's end. **[5]**

P.T.O.

Q5) a) An organization is granted the block 130.34.12.64/26. The organization needs to have four subnets with equal number of addresses in each subnet. What are the subnet addresses and the range of addresses for each subnet? **[6]**

b) What are general techniques to improve quality of service ? Explain any one in detail. **[6]**

c) Draw and Explain IPV6 header. Explain the significance of extension header. **[6]**

OR

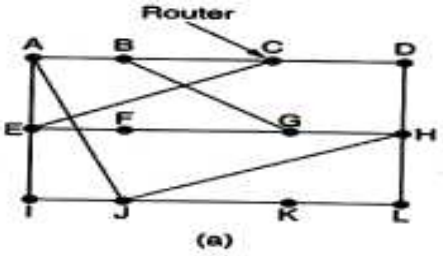
Q6) a) A host with IP address 130.23.3.20 and physical address B23455102210 has a packet to send to another host with IP address 130.23.43.25 and physical address A46EF45983AB. The two hosts are on the same Ethernet network. Show the ARP request and reply packets encapsulated in Ethernet frames. **[4]**

b) Write a short note on **[8]**

i) NAT

ii) ICMP

c) Explain Distance Vector Routing Algorithm? Consider topology given in fig.(a) and Vectors received from router J's four neighbors are given in fig (b). Calculate New routing table for router J using Distance Vector Routing Algorithm. **[6]**



(a)

To	A	I	H	K
A	0	24	20	21
B	12	36	31	28
C	25	18	19	36
D	40	27	8	24
E	14	7	30	22
F	23	20	19	40
G	18	31	6	31
H	17	20	0	19
I	21	0	14	22
J	9	11	7	10
K	24	22	22	0
L	29	33	9	9
	JA delay is 8	JI delay is 10	JH delay is 12	JK delay is 6

Vectors received from J's four neighbors

(b)

Q7) a) What causes Silly Window syndrome? How it is avoided? Explain. **[4]**

b) In a Stop-and-Wait system, the bandwidth of the line is 2 Mbps, and 1 bit takes 20 milliseconds to make a round trip. What is the bandwidth-delay product? If the system data packets are 2,000 bits in length, what is the utilization percentage of the link? **[4]**

c) For each of the following applications, determine whether TCP or UDP is used as the transport layer protocol and explain the reason(s) for your choice **[8]**

i) Watching a real time streamed video

ii) Web browsing

iii) A Voice over IP (VoIP) telephone conversation

iv) YouTube video

OR

Q8) a) What are the types of socket? Explain various socket primitives used in connection oriented client server approach. **[8]**

b) Explain UDP Header? Below is an Hexadecimal dump of an UDP datagram captured. **[8]**

e2 a7 00 0D 00 20 74 9e 0e ff 00 00 00 01 00 00 00 00 00 00 06 69 73 61 74 61 70 00 00 01 00 01

i) What is source port number?

ii) What is destination port number?

iii) What is total length of the user datagram?

iv) What is the length of the data?

v) Is packet directed from a client to server or vice versa?

Q9) a) What is the difference between persistent & non persistent HTTP? Explain HTTP request and reply message format. **[6]**

b) Write short notes on **[6]**

i) DHCP

ii) MIME

c) Explain DNS message format? **[4]**

OR

Q10)a) Explain FTP? Can we specify file transfer in a Web page? Explain with the help of suitable example. **[8]**

b) Browsers have a in-built caching mechanism for a better user experience. How do websites indicate if a web resource needs to be cached or not? Show HTTP messages in transit for both scenarios. **[8]**

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