Nirma University

Institute of Technology

Semester End Examination (IR), December - 2016

B. Tech. in Computer Engineering, Semester-V

2IT321 Computer Networks

Roll / Exam No. | Supervisor's Initial with Date

Time: 3 Hours | Max Marks: 100

Instructions:
1. Attempt all questions.
2. Figure to right indicate full marks.
3. Assume suitable assumptions and specify them.
4. Section wise separate answer book to be used.

SECTION – I

Q-1 Do as directed. **[20]**

A) What would be the minimum frame size for a CSMA/CD network running at 1 Gbps over a 2 Km cable with no repeaters? Show calculations. The signal speed in the cable is 200,000 Km/sec. **05**

B) What are the reasons for using layered protocols? **04**

C) Discuss about basic bit map protocol with example. Also discuss about the best case, worst case and average case channel efficiency when the said protocol is used. **05**

D) Discuss why following concepts are used, with suitable example: **06**
i. Sliding window ii. Pipelining iii. Piggybacking

Q-2 Answer the following. **[15]**

A) Measurements of a slotted ALOHA channel with an infinite number of users show that 20 percent of slots are idle. **07**
i.) What is the channel load, G?
ii.) What is the throughput?
iii.) Is the channel underloaded or overloaded?

B) Which is a "better" protocol (UDP or TCP) for the following applications? Justify your choice. **08**
1. Domain Name System
2. Multimedia application
3. File transfer application
4. E-mail application

OR

B) Discuss about flow control and buffering mechanism at Transport layer of TCP/IP reference model. **08**

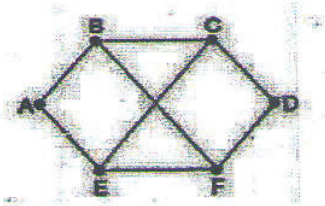
Q-3 Answer the following. **[15]**

A) 16 bit messages are transmitted using Hamming code. How many check bits are needed to ensure that the receiver and detect and correct a single bit error? Show the bit pattern transmitted for the message 1010111110110101. Assume that even parity is used. **06**

OR

A) Compare and contrasts between the TCP/IP and OSI reference models. **06**

B) Consider the subnet shown below. Distance vector routing is used, and the following vectors have just come in to 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? Also mention the outgoing line to be used and the expected delay. **06**



C) A network on the Internet has a subnet mask of 255.255.255.192. How many maximum number of hosts it can handle? Also state the advantage of using subnetting. **03**

SECTION – II

Q.4 Do as Directed. **[20]**

A) Why the following concepts are used? Justify with suitable example: **10**
i) Choke Packets ii) Bit Stuffing iii) Flooding iv) NAT

B) Compare the 802.3 Ethernet frame format with the new 802.1Q frame format used for VLAN aware bridges and switches. Discuss about the fields that differ. **06**

C) Discuss using diagrams Virtual LANs and its advantages in brief. **04**

Q-5 Answer the following. **[13]**

A) An IP router with a Maximum Transmission Unit (MTU) of 1500 bytes has received an IP packet of size 4224 bytes with an IP header of length 20 bytes. What are the values of the following fields in the header of the each IP fragment generated by the router for this packet? i) MF bit ii) Offset. Justify your answer. **05**

B) Justify. How can good quality of service be provided at the network layer? **08**

OR

B) Define socket. Discuss about the usage of following socket primitives: **08**
i.) socket
ii.) connect
iii.) bind

Q-6 Answer the following. **[17]**

A) What is the functions of LLC? Consider a 60 bytes IP packet including header, is being transmitted by the Ethernet with LLC not being used. Is padding necessary? If yes, how many bytes? **07**

B) Briefly describe the SMTP protocol. **04**

OR

B) Briefly describe DNS hierarchy used in the internet. **04**

C) Compare and contrast Virtual Circuit and Datagram subnets. **06**