Nirma University

Institute of Technology

Semester End Examination (RPR), December - 2017

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. Figures to the right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Assume suitable data wherever necessary and specify them.

Q-1. Answer the following. **[18]**

A) Discuss the usage of following concepts with suitable example. [06]
(i) NAT (ii) Bit stuffing (iii) Link state packets (LSP)

B) Give detailed comparison between Go-back-N ARQ and Selective Repeat ARQ flow control algorithms. [08]

C) 16 bit message is transmitted using Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single bit error? Show the bit pattern transmitted for the message 1101001100110101. (Assume even parity is used). [04]

OR

C) Compare and contrast between TCP/IP and OSI Reference model. [04]

Q-2. Do as directed. **[18]**

A) A data stream $X^6+X^5+X^3+X^2+1$ is transmitted using standard CRC method. The generator polynomial is X^3+X+1. Show actual bit stream transmitted through unreliable channel. Suppose 4^{th} bit from right is inverted in original data stream then show how error will be detected at receiver end. [08]

B) Give details about Ethernet frame structure. [06]

OR

B) Differentiate between circuit switching networks and packet switching networks. Identify applications where these types of networks are used. [06]

C) Show how efficiency of slotted aloha is double than the efficiency of pure aloha. [04]

Q-3. Answer the following. **[18]**

A) Differentiate between IPv4 and IPv6. In IPv4 if sender wants to send total data of 8000 bytes including minimum header size over a network having [10]

maximum transferable unit (MTU) as 2000 bytes including minimum header size then find out following:

(i) Number of fragments.

(ii) Identification bit (IF), More Fragmentation bit (MF) and Do Not Fragment bits (DF) for each fragment.

(iii) Fragmentation offset and range of each fragment.

B) Compare and contrast a random access protocol with a channelization protocols. [08]

OR

B) Give details about binary exponential back off algorithm. [08]

Q-4. Answer the following. **[20]**

A) What do you mean by count to infinity problem in distance vector algorithm? Explain it with two node instability and also suggest approach to overcome it. [06]

B) A company has one of the following addresses as 199.110.63.74/26. If company use Classless Addressing and want to divide all addresses into four departments then answer the following: [08]

(i) Total no. of IP address in 199.110.63.74/26.

(ii) IP address range of each sub-block/department each of 64 hosts.

(iii)IP Address of 4th host of 3rd department/block.

(iv) IP Address of last host of 1st department/block.

C) Discuss how leaky bucket algorithm shapes a bursty traffic into fixed rate traffic. [06]

Q-5. Do as directed. **[16]**

A) Demonstrate three way handshaking protocol used for new connection establishment and connection release at transport layer. [08]

B) Give any three differences between TCP and UDP and also explain the concept of Half close in TCP. [08]

OR

B) Draw TCP segment format with size of each field and explain the significance of checksum field in short. [08]

Q-6. Answer the following. **[10]**

A) Give details of DNS hierarchy used in the internet. [06]

B) With neat illustration briefly discuss Virtual LANs. [04]