Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 2640001 **Date: 22-05-2014**

Subject Name: Fundamentals of Networking (FON)

Time: 10:30 am - 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Write any seven **07**

1. Write one disadvantage of layering scheme.
2. Write one important difference between point to point and broadcast networks
3. Write the relation between number of levels and MDR for noiseless channel
4. What was the main advantage of using Manchester Encoding for the first version of Ethernet?
5. Why character count is not considered good technique for framing?
6. What are two different ways to arbitrate in MAC?
7. What are two most important functions of the network layer?
8. Write one service that the Internet transport layer should provide which it doesn't do.
9. What is DNS poisoning?

(b) Explain any seven terms **07**

1. Partially qualified domain name
2. Random Early Discard
3. Age Field in Link State Algorithm
4. Line of Sight
5. Selective repeat
6. A receiver window
7. Low earth orbit
8. Signal reshaping
9. Network Interface Card

Q.2 **(a)**

1. Write any two (6) **07**
   a. Write Two advantages of Layering scheme
   b. Describe role of Network layer and transport layer in brief when the user is sending mail
   c. Write two usages of a home network.
2. Write the definition of a network. (1)

(b)

1. Differentiate between any two (6) **07**
   a. a hub and a switch
   b. Connection oriented connection and connection less connection
   c. TCP/IP and OSI model
2. Write the name of network layer of Internet. (1)

OR

(b)

1. Write any two (6) **07**
   a. What is the difference between analog and digital signaling?
   b. Write two rules of communication relating to bandwidth, harmonics and data rate of a channel.
   c. Write three reasons for transmission errors.

2. Draw a figure indicating how 10101010 can be represented using phase modulation using two different phases. (1)

Q.3 (a) 1. Write any two (6) **07**

a. Give two cases where synchronization between sender and receiver becomes important issue
b. Show why FDM and TDM are not suitable for bursty data
c. Differentiate between Radio and Microwave

2. Why Gamma Rays and X-rays are not used for data transmission?

(b) 1. Write any two (6) **07**

a. Explain the total internal reflection principle
b. Explain with example the Hidden station problem
c. Give two important differences between 802.11a, b and g

2. Give one reason for choosing LEO to be used for data communication over GEO.

OR

Q.3 (a) 1. Write any two (6) **07**

a. Explain why error detection is preferred when number of errors are less and why error correction is preferred when number of errors are more
b. Show how the bit pattern 0101010 is processed using hamming code
c. Explain how flow control is performed at data link layer

2. Name the field Ethernet uses for multiplexing

(b) 1. Write any two (6) **07**

a. Why TCP use byte number in the input stream as a sequence number?
b. What should the receiver do when it receives a duplicate frame? Why?
c. Why redundancy is important for error handling?

2. What is the name of the process when the data frame additionally carries acknowledgement for the traffic coming from other side? (1)

Q.4 (a) 1. Write any two (6) **07**

a. List at least three different arbitration strategies used by different real world MAC layers
b. Why Ethernet, worked on the same principle as Aloha, perform far better?
c. Explain how binary exponential back off algorithm works.

2. What is the speed (Bandwidth) of fast Ethernet? (1)

(b) 1. Write any two (6) **07**

a. Write any three important issues which wireless systems face but wired systems don't?
b. Explain how the 802.11 works in PCF mode
c. Explain any three service classes provided by 802.16.

2. What the 802.1Q standard is designed to provide? (1)

OR

Q.4 (a) 1. Write any two (6) **07**

a. Show an example of aggregation of multiple routing table entries into one
b. Write at least three advantages of using connectionless forwarding vs. connection oriented forwarding
c. Explain how Distance Vector algorithm works in brief

2. Explain what a high availability solution is (1)

(b) 1. Write any two (6) **07**

a. Explain the lookup process in the router.

b. List at least three challenges a routing algorithm faces in MANets

c. Write at least three advantages of using labels for routing (in a system like MPLS) instead of IP addresses

2. Write what an external routing algorithm is. (1)

Q.5 (a) 1. Write any two (6) **07**

a. Write at least three duties of transport layer

b. Explain how TCP calculates the retransmission time

c. Explain what delayed duplicates are and what are the problems they create

2. What is the size of sequence number field in Internet? (1)

(b) 1. Write any two (6) **07**

a. Explain why three way handshake is chosen for TCP

b. Depict the connection close scenario when the protocol fails; i.e. the connection closes without the other party being aware of it.

c. Explain what fast recovery is w.r.t. TCP.

2. What is Maximum Segment Size in TCP? (1)

OR

Q.5 (a) 1. Write any two (6) **07**

a. Write at least three advantages of DNS being organized in hierarchy

b. Explain how name resolution takes place

c. What is conditional download w.r.t. HTTP? Explain with example

2. Give one example indicating use of Session variable (1)

(b) 1. Write any two (6) **07**

a. Give at least three reasons for DNS having distributed database.

b. Explain how proxy server works.

c. List at least three technologies for making the web dynamic.

2. Explain the purpose of CNAME resource record (1)

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