Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
M.C.A -IVth SEMESTER–EXAMINATION – MAY- 2012

Subject code: 640001   **Date: 15/05/2012**
Subject Name: Fundamental 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)** Explain following terms in a sentence or two (Any 7)   **07**
   1. Distributed System
   2. Flow Control
   3. Harmonic
   4. Asynchronous Digital Subscriber Line
   5. Stop and wait
   6. Selective Repeat
   7. Four service classes in 802.16
   8. Three way handshake
   9. Replay attack

   (b) Describe the usefulness of the following in a sentence or two (Any 7)   **07**
   1. Dividing networking stack in layers
   2. Active and passive repeater
   3. Station Keeping
   4. Flag byte
   5. Manchester Encoding
   6. Switch (w r t hub)
   7. Admission control
   8. POP3 server
   9. Privacy amplification

Q.2 **(a)** Give an example of following, Any 7   **07**
   1. Home application
   2. Frequency division multiplexing
   3. Error correcting code
   4. Piggy backing
   5. Hidden station problem
   6. Bluetooth profile
   7. Delayed duplicate
   8. CNAME resource record
   9. Substitution cipher

   (b) 1. Write any 2   **06**
   a) List four business needs of a network
   b) List four home requirements of a network
   c) Compare connection oriented vs connection less service. Write
       any two important points
   2. Write one reason for home networks not gaining popularity as they   **01**
   should.
                                   OR
   (b) 1. Write any 2   **06**

                                                                                1

a) Differentiate between broadcast and point to point networks. Give any two important differences.
b) Name any two types of wireless networks prevalent in the market
c) Write two reasons why OSI model failed and TCP/IP model succeeded

2. Write the difference between peer-to-peer vs. client server model **01**

Q.3 **(a)** 1. Answer any 2 **06**
   a) If the system is noiseless and eight levels are used when the medium bandwidth is 5Mb, what is the maximum data rate of the channel? The Nyquist equation is $MDR = 2\ H\ Log_2V$. The Shannon formula is $MDR = H\ log_2(1+S/N)$.
   b) Write two reasons which favors fiber optic cables over copper cable
   c) Compare GEO and LEO for communication needs. Provide two important points.

   2. Give full form of DMT. **01**

(b) 1. Answer any 2 **06**
   a) Show the problem with character count method of framing. How can we eliminate such problem using a flag byte?
   b) Show how a polynomial with odd number of terms will never be divisible by a devisor with x+1 as a factor for modulo 2 arithmetic.
   c) Give any two differences between Go Back N and Selective Repeat.

   2. Give full form of ARQ **01**

OR

Q.3 **(a)** 1. Answer any 2 **06**
   a) What will be the MDR of the channel if the same channel described in question 3 a) is now noisy with signal to noise ratio is 30db? ? The Nyquist equation is $MDR = 2\ H\ Log_2V$. The Shannon formula is $MDR = H\ log_2(1+S/N)$.
   b) How Total Internal Reflection principle helps in FO communication?
   c) Give two important differences between QPSK and QAM 64.

   2. Provide full form of ADSL. **01**

(b) 1. Write any 2 **06**
   a) How byte stuffing is improved by bit stuffing method?
   b) What is the precondition for the devisor for capturing all two bit errors in CRC method of error handling?
   c) Why sliding window protocols are called so?

   2. Give full form of CRC **01**

Q.4 **(a)** 1. write any 2 **06**
   a) Why was slotted Aloha through put was double than normal Aloha?
   b) List what services Integration and Distribution does for 802.11
   c) What is the need for security sub layer in 802.11?

   2. List two types of frames needed by 802.16 **01**

(b) 1. Write any 2 **06**
   a) Compare how VC and Datagram subnets react to congestion

2

b) Why Age field is required in LS?

c) How RED prohibits global synchronization problem?

2. Give example of the case where two different requirements routing algorithm cannot work well with each other. **01**

OR

Q.4 **(a)** 1. Write any 2 **06**

    a) Why was Manchester Encoding chosen for first version of Ethernet?

    b) Explain how fragmentations are managed in 802.11

    c) Write any two reasons for introducing 802.16 even when 802.11 was around and successful

2. write the amount of bandwidth offered by fast Ethernet **01**

(b) 1. Write any 2. **06**

    a) Show how DV and LS routing algorithms react to changes in the network like node or communication line going down or coming up.

    b) How AODV differs from DV?

    c) Why Hop by Hop Chock Packets algorithm provide faster relief to congested node than normal Chock Packets method?

2. Give one difference which makes routing in Ad Hoc networks more difficult than conventional network. **01**

Q.5 **(a)** 1. Write any 2 **06**

    a) Buffering and flow control are required in both Data Link as well as Transport layer, but the amount of work that is required in transport layer is much more. Justify

    b) Explain how three way hand-shake solves delayed duplicate problem.

    c) Explain why zones are required in DNS

2. Write full form of MIME **01**

(b) 1. Write any 2. **06**

    a) Explain terms, cryptology and cryptanalysis

    b) Two important principles of cryptography are redundancy and freshness, explain both.

    c) Write what is counter mode and why it is useful

2. Define Message Digest or give an example of message digest **01**

OR

Q.5 **(a)** 1. Write any 2 **06**

    a) Connection release cannot have foolproof result. Justify.

    b) What is the requirement of protocols like POP3 and IMAP when SMTP delivers mail to the receiver?

    c) What is name resolution in DNS? What are two types of name resolution?

2. Write full form of IMAP. **01**

(b) 1. Write any 2 **06**

    a) Explain terms Initialization Vector and substitution cipher

    b) Write two important reasons in favor or public key algorithms vs symmetric key algorithm for encryption.

    c) What is a digital signature? How it is different from conventional signature?

2. Why stream cipher is needed when one already have a block cipher? **01**

****

****