

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (OLD) - EXAMINATION – SUMMER 2017

Subject Code:181101

Date:02/05/2017

Subject Name: Data Communication and Networking (Department Elective - II)

Time:10:30 AM to 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) Answer the following in short. (One mark each) **07**
- 1 List any application layer protocol which uses UDP as transport layer protocol.
 - 2 Which flag is used to release TCP connection?
 - 3 Decrypt the following message which is encrypted using mono-alphabetic substitution cipher, where cipher text alphabets are shifted by 6 letters.
Cipher text = IGKYGXOYOTYKIAXK
 - 4 At the time of booting if Host A receives IP address from the server. Which protocol is being used?
 - 5 List any one message which can be called as broadcast messages on LAN.
 - 6 In bus topology which type of cable is used?
 - 7 A computer network consists of 30 stations. Suppose Six stations are designated as hubs, each fully interconnected with the others using mesh topology. The remaining 24 stations are equally distributed to the hubs such that any one station is connected to only one hub. Determine the number of links required.
- (b) Which of the OSI layer handles each of the following task? **04**
- (1) Determines which route through the subnet to use.
 - (2) Ensures end to end delivery
 - (3) Error free transmission
 - (4) Authentication
- (c) Host A needs to send a payload size of 2000 bytes to host B across the networks. If any intermediate router is having MTU size of 500 bytes how many fragments will be there and what will be the length of each fragment? **03**
- Q.2** (a) Explain architecture and services of Email. **07**
- (b) Discuss RSA algorithm with an appropriate example. Take any 4 letter message and show how it can be encrypted using RSA algorithm. **07**
- OR**
- (b) Explain authentication based on shared secret key with diagram. Also discuss reflection attack on the protocol. **07**
- Q.3** (a) Explain Link state routing algorithm with appropriate diagram. **07**
- (b) For IP address 170.242.32.56 with a subnet mask of 20 bits. **07**
- (1) Find out subnet address.
 - (2) Identify number of subnets on the network.
 - (3) How many hosts are possible on given subnet?
 - (4) What is broadcast address on given subnet?
 - (5) What is subnet mask?
 - (6) Identify host range on given subnet.
- OR**
- Q.3** (a) Draw IP header and explain function of each field. **07**

- (b) Explain token bucket algorithm with appropriate diagram. A Computer is regulated by token bucket with capacity 500kB. Bucket is full when 1MB burst arrives. Token arrival rate is 2MB/sec and maximum output rate is 25MB/sec. Identify how long the computer can transmit at the maximum output rate? Also find after how much time whole data will be transmitted? **07**
- Q.4** (a) Describe IEEE standard 802.3, specifically cabling, encoding and MAC sub layer. **07**
- (b) Discuss error detection and correction mechanisms with appropriate examples. **07**
- OR**
- Q.4** (a) Explain methods of framing with appropriate example. **07**
- (b) Discuss channel allocation problem and explain dynamic allocation. **07**
- Q.5** (a) Explain operation of LAN bridge from 802.11 to 802.3 with diagram. **07**
- (b) With diagram discuss various connection release scenarios of TCP. **07**
- OR**
- Q.5** (a) With diagram explain how address resolution protocol and reverse address resolution protocol work on network? **07**
- (b) Explain TCP window management with example. **07**
