

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA – SEMESTER – IV • EXAMINATION – WINTER - 2017

Subject Code: 3640002**Date: 30-12-2017****Subject Name: Basic Computer Science 3****Time: 02:30 pm to 05:00 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 Questions: **07**
- 1) Explain the term: Attenuation
 - 2) Write one difference between Switch and Router.
 - 3) _____ is a device that reshapes a digital signal.
 - 4) Single parity-check code cannot detect _____ errors.
 - 5) What is the main advantage of Piggybacking?
 - 6) What is flooding?
 - 7) _____ protocol provides end-to-end reliable data delivery.
- (b)** **07**
- 1) Which Protocol is used to route the packets between two autonomous systems?
 - 2) What is the difference between Cookie and Session Variable?
 - 3) Explain use of Persist Timer at Transport Layer.
 - 4) If the Signal to Noise ratio is 3, for a 10 Mb channel, what is the maximum data rate?
 - 5) Write two main advantages of using Multiprotocol Label Switching (MPLS)
 - 6) Explain Total Internal Reflection Principle.
 - 7) Why LEO is preferred over GEO for satellite data communication?
- Q.2 (a)** **02**
- 1) Difference between Analog Signal and Digital Signal **02**
 - 2) Define the terms Frequency and Amplitude. **02**
 - 3) Explain Different Modulation Techniques with proper examples. **03**
- (b)** **04**
- 1) Explain Hidden Station and Exposed Station problem and its solution in wireless communication. **04**
 - 2) Compare UTP cables with Fiber Optics cables. **03**
- OR**
- (b)** **03**
- 1) Explain CSMA protocol with its carrier sensing variants. **03**
 - 2) What is CSMA/CD? Explain how Binary Exponential Back off algorithm will be used in case of retransmission. **04**
- Q.3 (a)** **03**
- 1) Define duties of physical layer **03**
 - 2) Write few characteristics of Radio waves and Microwave for data transmission. **04**

- (b) 1) Compare Go-Back-N and Selective Repeat protocol for data communication. **03**
 2) If Message $M(X) = x^5 + x^4 + x + 1$ and Generator is $G(X) = x^3 + 1$ Compute CRC. **04**

OR

- Q.3** (a) 1) Write a short note on ISM band **03**
 2) Explain Adhoc and Infrastructure mode in brief. **04**
 (b) 1) What are the duties of Data Link Layer? Explain in brief with example. **03**
 2) How to correct Burst error using Hamming Code? For a given message 110101011 construct an even parity Hamming Code. **04**
- Q.4** (a) 1) Explain the use of Preamble, Pad and Type fields in 802.3 frame structure. **03**
 2) Write the difference between Classic Ethernet and Fast Ethernet. **04**
 (b) 1) What are the challenges for Routing in MANets? **03**
 2) Explain Adhoc On-demand Distance Vector routing with its Route Discovery Operation. **04**

OR

- Q.4** (a) 1) What is the use of Pause Frame? Draw a pause frame structure for 802.3 Ethernet. **03**
 2) Draw 802.11 frame structure. Why there are four address fields used in 802.11 frame structure? **04**
 (b) 1) Explain Link State Routing Algorithm steps with. **04**
 2) Draw Link State Packet format and explain the importance of Sequence Number and Age fields in it? **02**
 3) Write the Optimality Principle. **01**
- Q.5** (a) 1) What is congestion? How the congestion is detected at transport layer? **03**
 2) Explain RED, Fast Recovery, MDCA and AIMD w.r.t. congestion control at transport layer. **04**
 (b) 1) Write six advantages of Hierarchical Name Space. **03**
 2) Which are the two DNS name resolution techniques? Explain each of them in brief. **04**

OR

- Q.5** (a) 1) What Delayed Duplicates? What the transport layer does to solve this problem. **03**
 2) Explain Three Way Handshake mechanism for connection establishment process in TCP. **04**
 (b) 1) Draw HTTP Query and Response Structures and explain the components of request and status line. **04**
 2) Explain Bluetooth architecture. **03**
