Seat No.: _____ Enrolment No._____

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) 1) Which Protocol is used to route the packets between two autonomous systems? **07**

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)** 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) 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) 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)** 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) = x5 + x4 + x + 1 and Generator is G(X) = x3 + 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** **04**
		2)	Explain Three Way Handshake mechanism for connection establishment process in TCP.	
	(b)	1)	Draw HTTP Query and Response Structures and explain the components of request and status line.	**04**
		2)	Explain Bluetooth architecture.	**03**

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