Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VIII • EXAMINATION – SUMMER 2013

Subject Code: X81101 Date: 09-05-2013

Subject Name: Data Communication and Networking

Time: 10.30 pm - 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)**	Draw and Explain the OSI reference model for network.	**07**
	(b)	Which of the OSI layers handles each of the following: (i) Dividing the transmitted bit stream into frames. (ii) Determining which route through the subnet to use.	**02**
	(c)	A system has an n-layer protocol hierarchy. Applications generate messages of length M bytes. At each of the layers, an h-byte header is added. What fraction of the network bandwidth is filled with headers?	**05**
	(d)	Compare circuit-switched and packet-switched networks.	**07**
Q.2	**(a)**	Explain briefly Advanced Mobile Phone System.	**07**
	(b)	Write a short note on Digital Subscriber Line.	**07**
		OR	
	(b)	A signal is transmitted digitally over a 4-kHz noiseless channel with one sample every 125 μsec. How many bits per second are actually sent for each of these encoding methods? (i) CCITT 2.048 Mbps standard. (ii) DPCM with a 4-bit relative signal value. (iii) Delta modulation.	**07**
Q.3	**(a)**	What are the functions of data link layer? Explain different methods of framing.	**07**
	(b)	The following character encoding is used in a data link protocol: A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000 Show the bit sequence transmitted (in binary) for the four-character frame: A B ESC FLAG when each of the following framing methods are used: (i) Character count. (ii) Flag bytes with byte stuffing. (iii) Starting and ending flag bytes, with bit stuffing.	**07**
		OR	
Q.3	**(a)**	Write a brief note on sliding window protocols.	**07**
	(b)	Write short notes on (i) HDLC (ii) Point-to-Point Protocol.	**07**
Q.4	**(a)**	What are the key assumptions in Dynamic channel allocation in LAN ?	**07**

	(b)	Explain pure ALOHA and slotted ALOHA protocols.	**07**
		OR	
Q.4	**(a)**	Measurements of a slotted ALOHA channel with an infinite number of users show that 10 percent of the slots are idle. (i) What is the channel load, G? (ii) What is the throughput? (iii) Is the channel underloaded or overloaded?	**07**
	(b)	Explain physical layer transmission techniques in IEEE 802.11 standard.	**07**
Q.5	**(a)**	What are the policies that affect congestion in (i) Data link layer (ii) Network layer (iii) Transport layer	**07**
	(b)	Write short note on Shortest path routing algorithm.	**07**
		OR	
Q.5	**(a)**	Explain the various header fields of E-mail.	**07**
	(b)	Write short note on MPEG standards.	**07**

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