BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE **SEMESTER : V**
BRANCH: IT **SESSION : MO/18**

SUBJECT: IT5021 DATA COMMUNICATION

TIME: 3.00 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	What are the reasons for using layered protocols?	[2]
Q.1(b)	What are the different functions of network?	[4]
Q.1(c)	Describe the functions of each layer in the OSI model.	[6]
Q.2(a)	What do you understand by Shannon's Channel Capacity theorem?	[2]
Q.2(b)	Distinguish between single-mode fiber and multi-mode fiber.	[4]
Q.2(c)	A system is designed to sample analog signals, convert them to digital form with a 4-bit converter, and transmit them. What bit rate is required if the analog signal consists of frequencies between 400 Hz to 3400 Hz?	[6]
Q.3(a)	What is the sampling theorem?	[2]
Q.3(b)	What are the different advantages of biphase techniques?	[4]
Q.3(c)	Describe the delta modulation technique.	[6]
Q.4(a)	What is the difference between half duplex and full duplex?	[2]
Q.4(b)	A channel has a bit rate of 4 kbps and propagation delay of 20 msec. For what range of frame sizes does stop and wait gives an efficiency of atleast 50 percent.	[4]
Q.4(c)	A series of 8-bit message blocks(frames) is to be transmitted across a data link using a CRC for error detection. A generator polynomial of 11001 is to be used. Use an example to illustrate the CRC generation and checking process.	[6]
Q.5(a)	Define the different data transfer modes for HDLC.	[2]
Q.5(b)	Explain the selective repeat ARQ mechanism.	[4]
Q.5(c)	Two neighboring nodes A and B uses sliding window protocol with 3-bit sequence number. As the ARQ mechanism Go Back N is used with window size of 4. Assume A is transmitting and B is receiving Show window position for the following events: 1. Before A send any frame After A send frame 0,1,2 and receive ACK from B for 0 and 1.	[6]
Q.6(a)	Define the different phases involves in communication via circuit switching	[2]
Q.6(b)	Explain the X.25.	[4]
Q.6(c)	Compare the circuit, datagram packet and virtual circuit packet switching techniques.	[6]
Q.7(a)	Define the ATM.	[2]
Q.7(b)	Draw the flow chart for call establishment using virtual path in ATM.	[4]
Q.7(c)	Explain the ATM cell format for user-network interface and network-network interface.	[6]

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