NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA – 769008
Department of Electronics & Communications Engineering
BTech (7th Semester), Mid Semester Examination 2012-2013 (September)

Subject Code: EC-419 **Subject Name:** Computer Communication Network (Branch: EC)

Maximum marks: 39 (Full marks 30) **Time:** 2hours

This question paper contains one page.

Instructions:

1. Answer as many questions you can. Marks secured above 30 will be rounded up to 30
2. Due credit will be awarded for neatness in drawing and labeling diagrams.

Q. No.	Question Descriptions	Marks
1	Compare the TCP/IP reference model with the OSI model.	5
2	Match the following services to one or more of the seven OSI layers. a) Reliable end-to-end transmission of message b) Breaking a transmitted bit stream into frames c) Determine which route a subnet to choose d) Frame error and recovery e) Character conversion from EBCDIC to ASCII f) Electrical and mechanical interface details g) Email delivery system h) File management and transfer i) Segmentation and reassembly of messages j) Encryption of data for security purposes	5
3	Determine the total number of links needed for an N node topology connected as a) mesh topology. b) star topology. and c) ring topology. Mention the IEEE standards for these protocols a) Ethernet. b) Token bus. c) WLAN. and d) PAN	3+2
4	Use ASK. FSK and PSK to modulate and represent the signal (1 0 1 1 0 1 1 1 0). where '1' and '0' represents for 5V and -5V respectively.	3
5	A. Explain about the a) Bandwidth. b) Baud rate. c) Bit rate. and d) Data rate B. A digital signaling uses 8 discrete voltage levels (-1. 2. 3. 4. 1. -2. -3. -4) for transmission. Assume one voltage level takes 0.1μ second to transmit. Calculate its bit rate and baud rate.	3+2
6	A. Calculate the baud rate and type the encoding for the bit rates. a) 36. 000 bps. 4 QAM and b) 8. 000 bps. 32 QAM B. Represent a two amplitude. four-phase. 8-QAM	2+2
7	What is the theoretical maximum data rate for a communication channel having a 100 kHz bandwidth and operating at on S/N ratio of 20dB?	2
8	What is data encoding? Explain about the following encoding schemes with logical expressions and represent the signal (1 0 1 0 0 1 1 0 1 1 0 1) using them. a) RZ . b) NRZ-I. c) NRZ-L. d) Manchester coding. e) Differential Manchester coding	5
9	Assume a TDM frame of 24 voice channel with each 4000 Hz bandwidth and 8 bit (T1 system). Do the following. a) Represent the TDM frame. b) Calculate the total number of bits per TDM frame. transmission bandwidth. total data rate and channel data rate.	5

All the Best!