NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA – 769008
Department of Electronics & Communications Engineering
MTech (2nd Semester), Mid Semester Examination 2013-2014 (February)

Subject Code: EC-662 **Subject Name:** Communication Networks

(Branch: EC5)

Maximum marks: 30 **Time:** 2hours

This question paper contains one page.

Instructions:

1. Answer all questions
2. Due credit will be awarded for neatness in drawing and labeling diagrams.

Q. No.	Question Descriptions	Marks
1	Why is it generally true that a digital signal requires a higher bandwidth than an analog signal?	3
2	What is the purpose of layering structure? Explain about the OSI model.	1+5
3	Write short notes on HUB, Bridge, Router, Repeater, Switch and NIC by mentioning their layering structure.	3
4	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.	2+2
5	Calculate the bit rate and type the encoding for the following baud rates: a) 1, 000 baud, 32 QAM, b) 5, 000 baud, 32 FSK	2+2
6	Suppose channel 1 has vector code (1, -1) with data (1, 0, 1, 1) and channel 2 has vector code (1, 1) with data (0, 0, 1, 1). Assume both channels transmit simultaneously. Calculate the following for each channel a) Transmitted signal b) Row signal c) Decoded/data signal	3
7	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.	2
8	Represent the signal "0101101001101O1" using a) Manchester coding, and e) Differential Manchester coding.	3
9	What is the encoding method used in LANs set up according to IEEE Standard 802.3? What is the baud rate?	2

All the Best!