VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

[Central Technological Institute, Maharashtra State]

MATUNGA, MUMBAI- 400019

SEMESTER EXAMINATION	: **May 2013**	DATE OF EXAM	: **17th May 2013**
SEMESTER & PROGRAM	: **IV S.Y.B.Tech.**	MARKS	: **100**
TIME ALLOWED	: **3 HRS.**	TIME	: **1:30 p.m. to 4:30 p.m.**
COURSE	: **Electronics and Communication System**		

Q.1 ---------- **20M**

a. Define modulation. Explain the necessity for modulation.

b. Convert the decimal number $(17)_{10}$ to octal and hexadecimal number systems and find out the corresponding gray code for it.

c. An OP-AMP has a differential gain equal to 100dB and CMRR is 120 dB. If V1=3V and V2 = 2V, calculate the values of common mode output voltage and differential mode output.

d. Justify: FM is called a constant BW system.

Q.2 ---------- **20M**

a. Explain the amplification operation of transistor in Common Emitter configuration.

OR

a. Differentiate between Frequency Modulation and Amplitude Modulation. Draw waveform diagrams for both.

b. Minimize the following logic function using K-map and implement it using logic gates.
$Y(A,B,C,D) = \pi M(0,1,2,3,5,6,7,12,14)$

Q.3 ---------- **20M**

a. Explain frequency response of OP-AMP.

b. Explain Half-Subtractor and Full-Subtractor. Implement Full-Subtractor using Half-Subtractor.

Q.4 ---------- **20M**

a. Define Amplitude Modulation and Modulation index. Explain how modulation index can be calculated using the AM Wave. Calculate the depth of modulation if the carrier amplitude after AM varies between 4V to 1V.

b. Perform the BCD Subtraction (9 - 4) using 10's Complement. Also explain the implementation with proper Logic Diagram.

OR

b. Explain the following terms for a differential amplifier.
   a. Differential Signal
   b. Common Mode Signal
   c. Differential Gain
   d. Common Mode Gain
   e. CMRR

Q.5 ---------- **20M**

a. Write short notes on:
   1. FDM
   2. TDM

b. Implement the following combinational logic circuits using Multiplexer:
   1. Half-Adder
   Half-Subtractor