No. of Printed Pages : **3**

BIEL-014

01290

B. TECH. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2013

BIEL-014 : ANALOG COMMUNICATION

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** questions.*

1. (a) A 400 watts carrier is modulated on a depth of 75%. Calculate the total power in the modulated wave in the following. **5**
   (i) DSB-FC (ii) SSB-SC
   (b) Explain envelope detector method for demodulation of AM waves. **5**

2. State the properties of Hilbert transform and explain briefly how SSB modulated wave is generated using phase discrimination method. **10**

3. (a) Mention the significance of VSB modulation. **5**
   (b) Compare DSB-FC method with DSB-SC and SSB-SC. **5**

4. Explain with the help block diagram, the Armstrong method for generating FM signal. **10**

5. What is capture effect in FM ? Explain the necessity of pre-emphasis and de-emphasis. **10**

6. (a) Discuss the types, causes and effects of the various forms of noise which may be created within an amplifier. **6**

   (b) The noise figure of an amplifier is 10 dB. What is its noise temperature ? **4**

7. With the help of block diagram explain briefly the non-linear model of the phase locked loop. **10**

8. (a) Draw the block diagram of a super heterodyne receiver and explain the functions of each block. **6**

   (b) What do you mean by sensitivity and selectivity ? **4**

9. The probability density function (PDF) of a continuous random variable x in the range $(-3, 3)$ is defined as follows : **10**

$$f_X(x) = \begin{cases} \frac{1}{16}(3 + x^2), -3 \le x \le -1 \\ \frac{1}{16}(2 - 6x)^2, -1 \le x \le 1 \\ \frac{1}{16}(3 - x)^2, -1 \le x \le 3 \end{cases}$$

Verify that the area under the curve is unity. Also prove that the mean is zero.

10. Write short notes on **any two** of the following : 2x5=10

(a) Frequency division multiplexing

(b) Properties of Gaussian Process

(c) Generation of VSB modulated wave.