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BIEL-014

B. TECH. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2013

BIEL-014 : ANALOG COMMUNICATION

Time : 3 hours *Maximum Marks : 70*

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

1. (a) The cumulative distribution for a certain random variable is given as **6**

$$Fx\,(x) = \begin{cases} 0 & -\infty < x \leq 0 \\ kx^2 & 0 < x \leq 10 \\ 100k & 10 < x < \infty \end{cases}$$

(i) Find the value of k.

(ii) Find the value of P $(5 < x \leq 7)$

(b) Define mean or average, Variance of a random variable. **4**

2. (a) Determine the power content of the carrier and each of the sidebands for an AM signal having a percent modulation of 80% and a total power of 2500W. **5**

(b) Explain the square - law modulation for AM generation . **5**

3. (a) Write the properties and applications of Hilbert transform. 5

(b) Discuss briefly " Quadrature Carrier multiplexing". 5

4. Discuss how the VSB modulation is used in commercial TV signal. Discuss its merits and demerits. 10

5. (a) Define the following terms for FM wave 4

(i) Frequency deviation

(ii) Modulation index

(b) Explain the generation of FM waves using indirect method. 6

6. (a) What is shot noise ? Write expression for the shot noise current in a diode. 5

(b) A Receiver connected to a antenna whose resistance is 500 Ω has equivalent noise resistance of 30 Ω Calculate equivalent noise temperature. 5

7. (a) Discuss the non - linear effects in FM systems. 5

(b) Compare between slope detector and phase discriminator in FM demodulation. 5

8. (a) What is threshold effect in an envelope detector and in FM receivers ? 5

(b) What do you mean by figure of merit ? Calculate the figure of merit for a DSB - SC system. 5

9. (a) Explain briefly the coherent detection of DSBSC modulated waves. **6**

(b) State the properties of Gaussian Process. **4**

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

(a) Central limit theorem

(b) Comparison of amplitude modulation techniques.

(c) FM stereo multiplexing.
