DEGREE IN ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

December, 2012

BIEL-014 : ANALOG COMMUNICATION

Time : 3 hours   *Maximum Marks : 70*

Note :   (i) Attempt **any seven** questions.

(ii) Use of scientific calculator is **allowed**.

1.   Find the mean and variance of Random Variable   **10**
      X defined by the probability density function.

$$f \times (x) = \begin{cases} \dfrac{1}{b-a}, & a \leq x \leq b \\ 0 & \text{elsewhere} \end{cases}$$

2.   (a)   A broadcast transmitter radiates 10 kW   **4**
            when the modulation percentage is 60. How
            much of this is carrier power ?

      (b)   Explain the square-law diode modulation   **6**
            method for AM generation.

3.   (a)   Why cannot SSB-SC signal be used for   **5**
            'compatible' AM broadcasting ? What form
            of SSB could be so used ?

      (b)   State the properties of Hilbert transform.   **5**

4. (a) What do you mean by frequency translation ? **4**

   (b) Discuss the applications, merits and demerits of VSB modulation. **6**

5. Explain the Armstrong method for the generation of wideband FM. **10**

6. Describe the working of phase-locked loop with the help of block diagram. **10**

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

   (b) What is FM threshold ? How is FM threshold reduced ? **5**

8. An amplifier with a noise figure of 6 dB and gain 20 dB connected to another amplifier with a noise figure 16 dB and gain 60 dB. What is the overall noise temperature of cascaded system ? **10**

9. Derive an expression for figure of merit for SSB-SC system. **10**

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

    (a) Properties of Gaussian Process.

    (b) Costas loop.

    (c) White noise.