M 23187

Reg. No. : .....

Name : .....

IV Semester B.Tech. Degree (Reg./Sup./Imp. – Including Part Time) Examination, May 2013
(2007 Admn. Onwards)
PT 2K6/2K6 EC 403 : COMMUNICATION ENGINEERING – I

Time: 3 Hours Max. Marks: 100

Instruction : *Answer* ***all*** *questions.*

1. a) Define Gaussian process and state its properties.
   b) What is stationarity ? State the conditions for stationarity.
   c) What is meant by noise equivalent bandwidth ? Explain.
   d) Write short notes on Shot noise and Flicker noise.
   e) Compare SSB transmission with VSB transmission.
   f) Explain what is meant by selectivity of a receiver.
   g) Define modulation index for FM.
   h) Explain what are the drawbacks of direct method for FM generation. **(8×5=40)**

2. a) Explain the response of LTI system to random process. **$7^1/_2$**
   b) Explain conditional PDF and its properties. **$7^1/_2$**

   OR

3. a) Explain when is a random process said to be ergodic in mean. **6**
   b) The PDF of a random variable is given as $f_x(x) = ke^{-bx}$ for $x \geq 0$
   $= 0$ for $x < 0$ and $k, b > 0$
   find the values of k in terms of b. **9**

4. a) Explain what is meant by thermal noise . **6**
   b) Derive an expression for power spectral density of thermal noise. **9**

   OR

5. With supporting equations, compare the characteristics of all sources of noise. **15**

P.T.O.

6. a) Define modulation index. Explain the significance of modulation index. **6**

   b) Broadly distinguish SSBSC from DSDSC. **9**

OR

7. Draw a neat circuit diagram and block diagram of an AM transmitter and explain its principle of operation. **15**

8. a) Explain what is meant by pre-emphasis and de-emphasis. **6**

   b) Draw a schematic diagram of FM slope detector and explain its operation. Why is this method not often used in practice ? **9**

OR

9. a) What is threshold effect ? **5**

   b) Draw a neat block diagram of FM transmitter and explain its principle of operation. **10**