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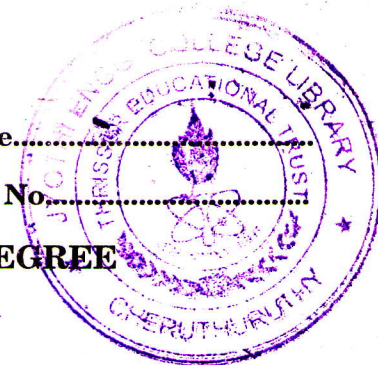
FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2006

EC 2K 503—ANALOG COMMUNICATIONS

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

I. (a) Write the properties of joint-distribution and density functions.

   (b) Define and explain ergodicity.

   (c) Define noise figure. Obtain an expression for noise figure.

   (d) Define SNR. Explain its significance.

   (e) Obtain the mathematical representation of AM wave.

   (f) What is VSB modulation ? Explain. Write its applications.

   (g) Differentiate AM from FM.

   (h) Explain how noise is minimized in FM receivers compared to AM.

   (8 × 5 = 40 marks)

II. (a) (i) Explain the correlation theory for WSS random process. (8 marks)

      (ii) Define and explain (1) Random process ; (2) Random variable. (7 marks)

Or

   (b) (i) State and derive Wiener Khinchie relation. (8 marks)

      (ii) Give an account on Ergodicity. (7 marks)

III. (a) (i) Derive the relation between noise figure and system temperature. (8 marks)

      (ii) With a neat sketch explain how noise figure is measured. (7 marks)

Or

   (b) Explain the characteristics of all noise components. Derive the supporting equations for all sources of noise.

   (15 marks)

IV. (a) (i) Derive the power relation for AM wave. (8 marks)

      (ii) Explain a method of generating and detecting SSB-SC wave with neat sketches.

   (7 marks)

Or

   (b) Draw neat block diagrams for TRF and super heterodyne receiver. Explain their principle of operation.

   (15 marks)

Turn over

V. (a) (i) Derive the mathematical representation of narrow band FM and wide band FM.

(8 marks)

   (ii) Explain a method to generate FM signals with a neat sketch. (7 marks)

Or

(b) Write short notes on :

   1 FM demodulators. (8 marks)

   2 Pre-emphasis and de-emphasis. (7 marks)

[4 × 15 = 60 marks]