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Name....

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Reg. No.

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2007

Electronics and Communication Engineering EC 2K 503—ANALOG COMMUNICATIONS

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

- I. (a) Explain the process of characterization of strict sense stationary random process in linear systems in the frequency domain.
 - (b) Define and explain the types of correlation and Covariance functions of random processes.
 - (c) Distinguish thermal noise from shot noise.
 - (d) Obtain the expression for noise figure for 2 stage amplifiers interms of gain.
 - (e) Compare SSB transmission with VSB transmission.
 - (f) Obtain the mathematical representation of AM wave. Draw its spectrum.
 - (g) List the methods to generate FM signals by indirect methods. Explain any one with neat sketches.
 - (h) Explain the properties of Narrow band FM.

 $(8 \times 5 = 40 \text{ marks})$

II. (a) (i) State and derive the properties of joint distribution and density functions. (8 marks)
(ii) Explain the correlation theory for WSS random process. (7 marks)

- Or
- (b) (i) Obtain the expense of LTI systems to random process. (8 marks)
 - (ii) Explain about filtered Gaussian random process.
- III. (a) Compare the characteristics of all sources of noise, with the supporting equations.

(15 marks)

(7 marks)

Or

(b) (i) Define and explain Noise figure. Derive an expression relating noise figure with effective temperature of the system.

(8 marks) (7 marks)

(8 marks) (7 marks)

- (ii) Explain the significance of noise equivalent bandwidth.
- IV. (a) (i) Explain any two methods of DSB-SC generation and detection with neat sketches.

(ii) Derive an expression for SNR for DSB-SC wave.

Or

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(b) Draw neat block diagrams for an transmitter and AM receiver. Explain their operating principle in detail.

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(15 marks) (8 marks) V. (a) (i) Differentiate wideband FM from narrow band FM. (ii) Obtain the mathematical representation of PM wave. (7 marks) Or (b) (i) Explain the effect of pre-emphasis and de-emphasis in FM. (8 marks)

(ii) Explain about noise in FM reception.

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 $[4 \times 15 = 60 \text{ marks}]$

(7 marks)