

D 33164

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Name:

Reg. No.



**FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
FEBRUARY 2013**

EC 04 406—ANALOG COMMUNICATIONS

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

- I. (a) Explain the operation of diode detector with the help of circuit diagram.
- (b) What is pre-emphasis and de-emphasis ? Explain.
- (c) Explain, what is FDM system ?
- (d) Discuss the basic principles of colour TV.
- (e) Define Gaussian processes and state its properties.
- (f) Explain, what is meant by thermal noise ?
- (g) Explain, what is threshold effect in FM system ?
- (h) What is meant by aliasing in sampling theory ? Explain.

(8 × 5 = 40 marks)

Part B

- II. (a) (i) Draw the block diagram of phase-shift method for generating SSB signal and explain its operation.

(9 marks)

- (ii) Draw the spectra of VSB signal and explain what is VSB ?

(6 marks)

Or

- (b) (i) Explain, how FM is generated with the help of varactor diode ?

(9 marks)

- (ii) Explain, how phase modulated signal is generated from FM ?

(6 marks)

- III. (a) Draw the block diagram of FM receiver and explain the function of each block in detail.

(15 marks)

Or

- (b) (i) Explain the functional operation of a TDM system. Compare its performance with the FDM system.

(8 marks)

- (ii) Discuss the principle of operation of colour TV receiver.

(7 marks)

Turn over

IV. (a) (i) A random process is characterized by the auto-correlation function :

$$R(\tau) = \exp(-2|\tau|).$$

Determine the power spectral density of the random process.

(12 marks)

(ii) Explain, what is noise figure ?

(3 marks)

Or

(b) (i) Consider a random process $x(t) = 5 \cos(100t + \theta)$, where θ is a random variable uniformly distributed over $[0, \pi]$. Determine whether the process $x(t)$ is ergodic in mean.

(10 marks)

(ii) Explain, what is meant by wide-sense stationary random process ?

(5 marks)

V. (a) Derive the signal-to-noise ratio for coherent reception with SSB modulation system.

(15 marks)

Or

(b) (i) Explain the detection of pulse time modulated signal.

(6 marks)

(ii) Show that mean of quadrature component of a zero-mean narrow-band noise is zero.

(9 marks)

[4 × 15 = 60 marks]