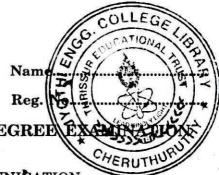**C 40951**

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FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, APRIL 2013

EC 09 404/PTEC 09 403—ANALOG COMMUNICATION

(2009 Scheme)

[Regular / Supplementary / Improvement]

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer **all** questions.*

1. What is the significance of Power spectral density ?

2. Draw the phasor representation of an AM wave.

3. Define frequency deviation.

4. What is an Image frequency ?

5. Define effective noise temperature.

(5 × 2 = 10 marks)

Part B

*Answer any **four** questions.*

6. Write a note on Ergodic processes.

7. A modulating signal $V_m = 25 \cos 2\pi(1 \times 10^3)t$ is used to amplitude modulate the carrier signal $V_c = 50 \cos 2\pi(25 \times 10^3)t$. Find the lower and upper side frequencies, modulation Index and efficiency of the modulated wave.

8. State and explain Carson's Rule.

9. What is a varactor diode ? How it is used to generate the FM wave ?

10. The Q factor of a preselector receiver is 100. Find the Image frequency and its rejection ratio for a tuning of 1155 kHz.

11. Write a note on :

    (a) Thermal noise and

    (b) Flicker noise.

(4 × 5 = 20 marks)

Turn over

Part C

12. (a) Discuss in detail about the Random Variables and its significance in Communication.

Or

(b) Discuss in detail about auto correlation and cross correlation.

13. (a) Derive an expression for the AM wave, its power relation and efficiency.

Or

(b) Derive an expression for the output signal to noise ratio of a DSB – SC receiver using Coherent detection.

14. (a) Explain the operation of a Double conversion receiver.

Or

(b) Draw the block diagram of a Phase Locked Loop and explain the FM demodulation process using PLL.

15. (a) Explain the various sources of noises.

Or

(b) Derive an expression for the output signal to Noise ratio of an FM receiver.

(4 × 10 = 40 marks)