Roll No .....

EI - 503

B.E. V Semester

Examination, December 2015

Communications Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What do you mean by mutually orthogonal functions explain?

b) What relationship exists between analog angular frequency and digital angular frequency.

c) What are the different conditions for the existence of the Fourier transform.

d) Evaluate the following integral by explaining shifting property of delta function $\int_{-\infty}^{\infty}\left(t^2+1\right)\delta(t)\,dt$

OR

Prove that $f(bt) \leftrightarrow \frac{1}{|b|}F\left(\frac{w}{b}\right)$

Where F(w) is the Fourier transform of $f(t)$

Unit - II

a) What is cost as loop?

b) Comment on power of an angle modulated wave.

c) Explain immunity of angle modulation to nonlinearities.

d) Draw and explain phasor diagram of AM wave.

OR

Comment on choice of intermediate frequency in AM receiver?

Unit - III

a) Write few merits and demerits of ratio detector.

b) Draw and explain AGC system.

c) What is VCO explain?

d) Draw the block diagram of superheterodyne receiver and explain function of each block.

OR

Draw and explain preemphasis and deemphasis in an FM system.

Unit - IV

a) Draw the equivalent circuit of a noise resister and explain.

b) A signal m(t) of bandwidth B = 4KHz is transmitted using a binary compounded PCM with $\mu = 100$. Compare the case of L = 64 with the case of L = 256 from the point of view of transmission bandwidth and output SNR.

c) Explain polar signalling of PSK.

d) Derive probability of error in ASK system.

OR

Explain intersymbol interference in PCM.

Contd...

Unit - V

5. a) An earth station antenna has a diameter of 30 m, has an overall efficiency of 68% and is used to receive a signal at 4150 MHz. At this frequency, the system noise temperature is 79K when the antenna points at the satellite at an elevation angle of 28°. What is the earth station G/T ratio under these conditions? If heavy rain causes the sky temperature to increase so that the system noise temperature rises to 88K, what is the new G/T value?

b) Draw the block diagram of simified earth station receiver and explain its function.

c) Draw and explain TDMA frame structure.

d) Derive for orbital period and explain the concept.

$$T = \frac{2\pi r^{3/2}}{\mu^{1/2}}$$

where $\mu = GM_E$

OR

Explain Kepler three law of planetary motion.

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