Roll No .....

EC - 405

B.E. IV Semester Examination, June 2014

Analog Communication

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) Find the Fourier transform of a constant function $f(t) = A$.
b) State and prove time shifting property of Fourier transform.
c) Prove the time convolution theorem.
d) Explain and differentiate the following
i) Linear and non linear system.
ii) Time invariant and time varying systems.
iii) Causal and non causal system.

OR

Define power signal. State and prove Parseval's power theorem.

Unit - II

2) a) A single tone modulating signal $e_m = E_m \cos wmt$ amplitude modulates a carrier $e_c = E_C \cos wct$ derive an expression for AM wave.
b) What are the various reasons for errors in synchronous detection?
c) With the help of block diagram describe the phase shift for SSB-SC generation.
d) Explain the envelope detector method for detection of AM. Also discuss the choice of time constant R-C.

OR

Describe any one method for generation of suppressed carrier signal.

Unit - III

3) a) Show how PM is generated from FM.
b) A single tone modulating signal $f(t)=E_m \cos wmt$ frequency modulates a carries A cos*wct*. Find the frequency deviation.
c) Define and explain modulation index for frequency modulation and phase modulation.
d) With the help of circuit diagram explain FM modulation circuit using varactor diode.

OR

Explain ratio detector method of detection of FM signals. Give its merits and demerits.

Unit - IV

4) a) Compare low level and high level AM transmitters.
   b) Why frequency stabilization system is required in FM transmitters? Explain.
   c) Define and explain following receiver characteristics
      i) Selectivity
      ii) Fidelity
      iii) Sensitivity
   d) How super heterodyne receiver is an improvement over TRF receiver? Draw the block diagram of super heterodyne receiver and explain its working.

OR

What is the function of FM receiver. Draw its block diagram and describe all the stages of the block diagram.

Unit - V

5) a) The noise figure of the individual stages of a two stage amplifier is 2.03 and 1.54 respectively 62. Evaluate the overall noise figure.
   b) Define and explain white noise. Draw power spectrum of white noise.
   c) State explain and prove the principle of superposition of spectra for noise signals.
   d) Define and explain in detail.
      i) Noise Bandwidth
      ii) Noise temperature
      iii) Noise figure

OR

Deduce expression for calculation of equivalent noise temperature of cascaded stages.

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