

R09

Code No: 09A50407

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech III Year I Semester Examinations, May/June – 2013

Analog Communications

(Electronics and Communications Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

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- 1.a) Give a mathematical expression for an AM signal and explain.
- b) Show, how a square-law device can be used to generate an AM signal? [15]
- 2.a) Draw AM transmitter block diagram and explain function of each block.
- b) Draw the circuit of a demodulator for DSB-SC signal and explain. [15]
- 3.a) Distinguish between DSB and SSB-SC system of modulation. Sketch their waveforms.
- b) Discuss a suitable method of generating an SSB signal. Describe a method of detecting such signal. [15]
- 4.a) Derive an expression for an FM signal with carrier frequency  $f_c$  and a modulating signal  $A_1 \cos \omega_1 t + A_2 \cos \omega_2 t$ . Obtain an expression for the spectrum.
- b) Compare narrowband FM and AM Signals. [15]
- 5.a) Explain a method for generating FM signal using a FET reactance modulator.
- b) Explain the operation of ratio detector with the help of neat diagrams. [15]
- 6.a) Compare the merits and demerits of AM and FM. Discuss the SNR improvements in the above systems, giving specific values in terms of modulating parameters.
- b) Explain the pre-emphasis and de-emphasis. [15]
- 7.a) Draw block diagram of superheterodyne receiver and explain function of each block.
- b) What do you understand by the following:
  - i) Selectivity
  - ii) Fidelity
  - iii) Delayed AGC. [15]
- 8.a) With a neat diagram explain the generation of PWM signal.
- b) Explain the generation of single polarity PAM signal. [15]

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