

Code No: 135SA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, February - 2022

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Define modulation and modulating signal.
b) AM radio transmitter radiates 10KW and carrier power is 8.5 KW. Calculate the modulation index?
c) Draw the frequency spectrum of DSB-SC modulation with necessary mathematical expressions. [5+5+5]
- 2.a) Explain generation of DSB-SC signal with the help of balanced modulator using diodes.
b) How AM is generated using square law modulator? Derive relevant expressions. [8+7]
- 3.a) Illustrate the block diagram for the detection of SSB – SC signal using phase discrimination method.
b) Why VSB modulation is used in TV broad casting? Give the VSB filter characteristics with spectrum. [7+8]
- 4.a) Explain with diagram various types of Single sideband system. Compare the relative power distribution and frequency spectra of conventional AM and Single sideband (SSB) systems.
b) A modulating signal of $2 \cos 5000t$ is amplitude modulated over a carrier signal of $5 \cos 20000t$. Derive expressions for LSB and VSB frequencies, Bandwidth and the ratio of Side Band Power in the Total Power of AM wave. [7+8]
- 5.a) Explain the generation of FM wave using direct method.
b) Discuss the detection of FM wave using zero crossing detector. [7+8]
- 6.a) Explain how FM signal is detected with the help of PLLs.
b) Explain the generation of Narrowband Frequency Modulation with suitable block diagrams. [7+8]
- 7.a) Describe thermal noise and shot noise.
b) Compare the noise performance in frequency modulated system and amplitude modulated system. [7+8]
- 8.a) Draw the circuit of PPM demodulator and explain the operation.
b) Explain FM receiver with neat block diagram. [8+7]

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