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Code No. : 31323

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (ECE) III Year I-Semester Main & Backlog Examinations, December-2017

Analog Communication

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Inspect whether coherent detector be used for AM signal detection? Present time domain analysis.
2. Compare linear modulation schemes based on transmission power requirement.
3. Justify that FM is a non-linear modulation technique.
4. An angle modulated wave is given by $S(t) = 10 \sin(2\pi 10^8 t + 5 \sin 2\pi 10^4 t)$. Calculate Maximum Frequency deviation & power dissipated in a 10Ω resistor.
5. When a super heterodyne AM receiver is tuned to 1000 kHz. What is the image frequency? The antenna of this receiver is connected to the mixer via a tuned circuit whose loaded Q is 60. Find Image Frequency Rejection Ratio (IFRR)?
6. Emphasize on the need for amplitude limiter in FM receivers?
7. Classify the sources of noise.
8. Define and relate Noise figure and Noise Equivalent temperature.
9. Draw the frequency spectrum for under sampling, critical sampling and over sampling of message signal.
10. Illustrate the generation of PPM signals with neat sketch.

Part-B (5 × 10 = 50 Marks)

11. a) Summarize the analysis on how a Square law device can be used for AM signal generation and detection with necessary time and frequency domain analysis, diagrams and waveforms. [8]
b) What are the advantages of SSB-SC over other linear modulation techniques? [2]
12. a) Discuss generation of Narrow Band FM signal. Bring out the similarities and differences between NBFM and AM. [5]
b) How Balanced frequency discriminator performs demodulation of FM signal. Explain. [5]
13. a) Explain the working of Low level AM transmitter with the help of a neat block diagram. What is the frequency range used for AM broadcasting? [5]
b) What are the drawbacks of TRF receiver and explain how these are overcome using super heterodyne receiver. [5]
14. a) Analyze the noise performance of FM system and derive the expression for Figure of Merit. [8]
b) Calculate Figure of Merit of AM system if a single tone message signal is modulated to depth of 60%. [2]
15. a) Explain the generation and detection of PPM signal. [5]
b) State and prove the sampling theorem for low pass signals. [5]
16. a) Demonstrate single tone SSB-SC modulation and demodulation assuming Upper Side Band transmission. [5]
b) Emphasize on the need for Pre & De-emphasis circuits in FM systems. [5]
17. Answer any *two* of the following:
a) FM transmitter [5]
b) Noise performance of AM system [5]
c) Natural and Flat –top sampling. [5]

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