

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--

Code No. : 31303 S

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (E.C.E.) III Year I-Semester Supplementary Examinations, May/June-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. State the need for modulation.
2. Compare Amplitude Modulation techniques w.r.t. the spectrum bandwidth.
3. What is the difference and similarity between AM and NBFM.
4. Generate PM signal using FM Signal.
5. Define the following terms
  - a) Image Frequency
  - b) Double Spotting.
6. List out the advantages and disadvantages of TRF receiver.
7. Write SNR expressions for FM and AM.
8. Represent narrow band noise in terms of I and Q components.
9. Compare PAM, PWM, PPM.
10. Mention different types of sampling conditions.

**Part-B (5 × 10 = 50 Marks)**

11. a) Explain demodulation of AM using envelope detection with neat sketches. [6]  
b) The output power of an AM transmitter is 1KW when sinusoidally modulated to a depth of 100%. Calculate the power in each side band when the modulation depth is reduced to
  - i) 50%.
  - ii) 75%. [4]
12. a) Explain with neat block diagram, the direct method of generating FM signal. [6]  
b) Consider an angle modulated signal  $s(t) = 3 \cos [2\pi 10^6 t + 2 \sin(2\pi 10^3 t)]$  find it's
  - i) Instantaneous frequency at time  $t = 0.25$  ms and  $t = 0.5$  ms
  - ii) Maximum phase deviation
  - iii) Maximum frequency deviation. [4]
13. a) Explain TRF receiver. Also explain the basic super heterodyne principle. [6]  
b) In a broadcast super heterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 100. If the IF frequency is 455 kHz, determine the image frequency and its rejection ratio for tuning at 1.1 kHz. [4]
14. a) Explain Effect of Noise on DSB SC Modulation. [6]  
b) An AM system with envelope detection is operating at threshold. Determine the power gain in decibels needed at the transmitter to produce  $(S/N)_o = 30$  dB for tone modulation with  $m = 1$ . [4]

15. a) Describe the generation and demodulation of PPM with the help of block diagram. [7]  
b) What is aperture effect? [3]
16. a) What is quadrature null effect and explain how to overcome this using Costas Receiver? [5]  
b) Explain the Foster Seeley discriminator method of FM detection. [5]
17. Write short notes on any *two* of the following:
- a) Pre emphasis and De emphasis [5]
  - b) Amplitude limiters in FM [5]
  - c) Sampling theorem for Band pass signals. [5]

