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# P.E.S. College of Engineering, Mandya - 571 401

***(An Autonomous Institution affiliated to VTU, Belagavi)***

## Fourth Semester, B.E. - Electronics and Communication Engineering

## Semester End Examination; May/June - 2019

## Analog Communication Theory

*Time: 3 hrs* *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

### UNIT - I

1 a. Define Amplitude Modulation. Derive the expression on AM by both time domain and frequency domain representation with necessary waveforms. 10

b. What is Hilbert transform? State any three properties of Hilbert transform. 4

c. Derive the expression for the following :

i) Modulation index in terms of $P_T$ and $P_C$ 6

ii) Current relation of AM wave

2 a. Explain the generation of AM wave using SQUARE-LAW modulator along with relevant diagram and analysis. 10

b. Explain the detection of message signal from amplitude modulated signal using an envelope detector and bring out the significance of RC time constant. 10

### UNIT - II

3 a. With neat block diagram, explain the balanced modulator method of generating DSB-SC wave. 10

b. With block diagram and related equation, explain coherent detection of a DSB-SC wave. What are its disadvantages? 10

4 a. List the advantages, disadvantages and applications of SSB-SC wave. 10

b. With a neat transmitter and receiver block diagram, explain Quadrature amplitude modulation. 10

### UNIT - III

5 a. Describe the generation of VSB-SC wave using filtering technique. 10

b. With block diagram, explain multiplexer and demultiplxer in TV transmitter and reciver respectively. 10

6 a. Explain the coherent detection of VSB-SC wave. 10

b. With a neat block diagram, explain the operation of FDM technique. 10

### UNIT - IV

7 a. Define angle modulation. Describe with the help of block diagram schemes for generating;

i) FM wave using PM 10

ii) PM wave using FM

b. Derive the equation for FM wave. Define modulation index, maximum deviation and bandwidth of FM signal. 10

Contd…2

8 a. Explain the generation of FM wave using direct method. 10

b. Explain the demodulation of FM wave using PLL. 10

**UNIT - V**

9 a. Define the following terms :

i) Shot noise ii) Thermal noise 10

iii) White noise iv) Noise figure

b. For a linear two port device, derive an equation for equivalent noise temperature. 10

10 a. Describe the noise in SSB-SC receiver. 10

b. With a block diagram and equivalent circuit, explain preemphasis and deemphasis. 10

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