PVP 12

Code: EC4T5

II B.Tech - II Semester – Regular Examinations - JUNE 2014

ANALOG COMMUNICATIONS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

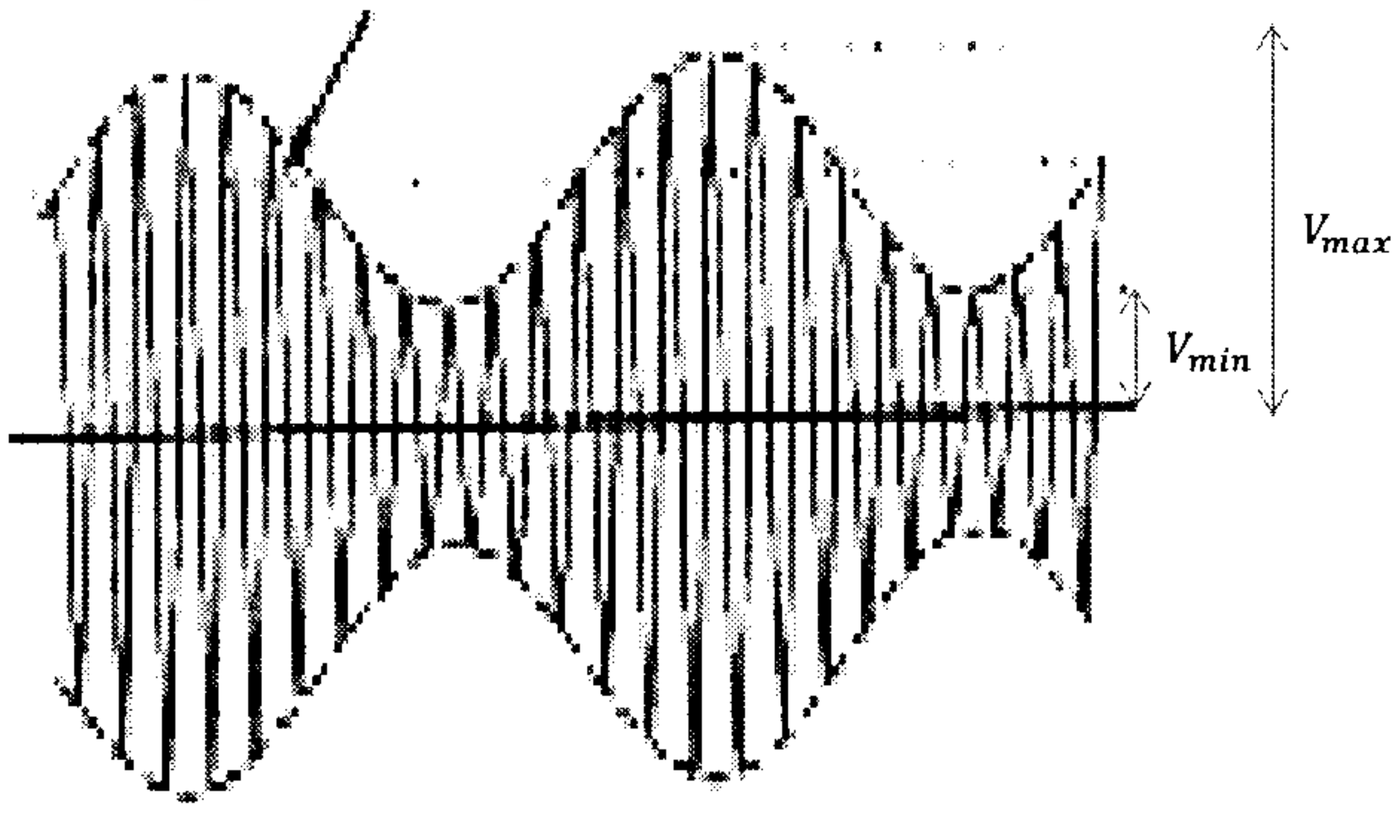
Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Define Amplitude Modulation and write the equation for modulated waveform and define modulation index and percentage modulation? 4 M

   b) Draw AM waveform and calculate modulation index in terms of V_{max} and V_{min}? 4 M

   c) For AM modulated wave shown in fig.1 V_{max} and V_{min} values are 20V and 10V respectively. Find the following for the modulated wave
      (i) Modulation Index. (ii) Amplitude of the carrier.
      (iii) Total power delivered to the load of 500Ω. 6 M



2. a) Explain the DSB-SC generation using balance modulator? 4 M

b) Evaluate the effect of a phase error and frequency error in the local oscillator on synchronous DSB-SC demodulator. 4 M

c) Explain the demodulation of DSBSC waveform using COSTAS LOOP. 6 M

3. a) Explain with block diagram, the frequency discrimination method of generating SSB modulated waves, and write its advantages and disadvantages? 7 M

b) Explain the need of VSB modulation and why it is widely used for TV broadcasting? 7 M

4. a) Derive the expression for wide band FM wave in terms of Bessel function? 8 M

b) Compute the bandwidth requirement for transmission of FM signal having a frequency deviation 75 KHz and an audio bandwidth of 10 KHz. What will be the change in the bandwidth, if modulating frequency is double? Determine the bandwidth when modulating signal amplitude is also doubled? 6 M

5. a) Explain the demodulation FM with the help of PLL? 8 M

b) The equation for an FM wave is
$s(t)= 10 \sin(5.7\times10^{8}t+5 \sin 12\times10^{3}t)$ Calculate 6 M
(i) Carrier frequency?
(ii) Modulating frequency?

(iii) Modulation index?
(iv) Frequency deviation?
(v) Power dissipated in 100Ω?

6. a) Distinguish between Pre-emphasis and De-emphasis? 8 M

b) Calculate signal to noise ratio for FM receiver? Find its figure of merit? 6 M

7. a) List the advantages and disadvantages of TRF(Tuned Radio Frequency) receivers? 6 M

b) A tuned circuit is having a 15 μH coil with a resistance of 25Ω is connected in parallel with a 67.6 pF variable capacitor. Calculate bandwidth of the tuned circuit? 4 M

c) What is an image frequency? How is image frequency rejection achieved in super heterodyne receiver? 4 M

8. a) What is Pulse position modulation ? How it is modulated and demodulated? 8 M

b) Explain Time Division Multiplexing? 6 M