

Code: EC4T5

II B.Tech - II Semester–Regular/Supplementary Examinations
April 2019

ANALOG COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22M

1.

- a) Write the formula for modulation index of a multi tone AM signal?
- b) Find the percentage of power saving when the carrier and one of the side bands are suppressed in an AM signal modulated to a depth of 50 percent?
- c) What are the advantages of SSB-SC over DSB-SC?
- d) Draw the spectrums of narrow band FM and AM signals.
- e) The output of an analog multiplier would be which modulated signal.
- f) Draw the block diagram to generate PM signal using frequency modulator.
- g) What is a coherent receiver and draw its block diagram?
- h) What is the need for modulation?
- i) Write the difference between TDM and FDM?

- j) Find the Nyquist sampling rate of the signal
 $g(t) = 10 \cos(20\pi t)\cos(200\pi t)$?
k) Define Pre-emphasis and De-emphasis.

PART – B

Answer any **THREE** questions. All questions carry equal marks.
3 x 16 = 48 M

2. a) Write the time domain and frequency domain equation of amplitude modulated signal. Describe its generation using square law modulator. 8 M
- b) Explain demodulation of AM using envelope detector with neat sketches. 8 M
3. a) Describe phase shift method of SSB demodulation and mention its disadvantages. 8 M
- b) What is VSB modulation? Prove that VSB plus carrier signal can be demodulated using envelope detector? 8 M
4. a) Derive the time domain equation for wide band FM signal and find its total power. 8 M
- b) Explain the operation of balanced slope detector for detecting FM signal with neat circuit diagram and mention its disadvantages. 8 M

5. a) Find the figure of merit of Frequency modulation receiver. 8 M
- b) Mention the disadvantages of tuned radio frequency (TRF) receiver. Explain the operation of super heterodyne receiver with neat block diagram and also mention how it overcomes the disadvantages of TRF. 8 M
6. a) Compare different pulse modulation techniques PAM, PWM and PPM. 8 M
- b) Draw the block diagram of TDM system and explain its working. 8 M