

OLD F.C.E.  
Sub: - Fundamentals of Communication Engineering  
(3 Hours)

Q.P. Code : 50770

Total marks: 80

Note : (i) Question 1 is compulsory and Solve any three from the remaining five questions  
(ii) Assume suitable data if necessary.  
(iii) Figures to the right indicate full marks

- Q.1. Answer any **four** questions from the following: [20]
- a Compare AM and FM..
  - b What is multiplexing? Compare TDM with FDM.
  - c Discuss the need for Pre emphasis and De emphasis circuits with waveforms.
  - d With a neat circuit diagram and waveforms , explain the working of envelope detector. What are its merits and demerits?
  - e Explain the working of TRF Receiver with a neat block diagram. What are its merits and demerits?
- Q.2.a Explain the generation and detection of DSB-SC with neat diagrams [10]
- b. Bring out the salient features of Vestigial Side Band system(VSB). [04]
- c. A sinusoidal carrier has amplitude of 6v and frequency 20 KHz is amplitude [06]
- modulated by a sinusoidal voltage of amplitude 3v and frequency 2 KHz. Modulated voltage is developed across a 50Ω resistance. i) find the modulation index and Write the equation for modulated wave and d ii) calculate total power and sideband power in the modulated wave iv) Draw the two sided spectrum of modulated wave and find its BW.
- Q.3.a With the help of a neat circuit diagram, explain the working of Ratio detector. Compare its [10]
- features with that of Foster Seelay discriminator.
- b. Draw the functional block diagram of Super-heterodyne receiver with waveforms at the output [10]
- of each block. Explain the functions of each block.
- Q.4.a With a neat block diagram ,discuss the working of Linear Delta modulation , Bring out its [10]
- advantages and disadvantages
- b. State and Prove Sampling theorem for low pass signals. Draw the spectrum of sampled signal for [10]
- $f_s > 2W$  ,  $f_s < 2W$  ,  $f_s = 2W$ . What is Aliasing error? How can you overcome it?
- Q.5.a. Explain the terms with reference to Radio receivers: Selectivity, Sensitivity, Fidelity and Double [10]
- spotting, AGC
- b. Discuss the generation and demodulation of PPM signal. For a sinusoidal modulating signal, [10]
- draw PPM, and PWM pulses.
- Q.6 **Write short notes on any four:** [20]
- a) Indirect method of FM wave generation
  - b) PCM Transmitter and receiver
  - c) Noise triangle
  - d) Product demodulator of SSB-SC
  - e) Companding

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