Q.1. Answer any four questions from the following:  
   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.  
   b. Bring out the salient features of Vestigial Side Band system (VSB).  
   c. A sinusoidal carrier has amplitude of 6V and frequency 20 KHz is amplitude 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 features with that of Foster Seelay discriminator.  
   b. Draw the functional block diagram of Super-heterodyne receiver with waveforms at the output 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 advantages and disadvantages.  
   b. State and prove Sampling theorem for low pass signals. Draw the spectrum of sampled signal for $f_s > 2W$, $f_s < 2W$, $f_s = 2W$. 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 spotting, AGC.  
   b. Discuss the generation and demodulation of PPM signal. For a sinusoidal modulating signal, draw PPM, and PWM pulses.  

Q.6. Write short notes on any four:  
   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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