

- (b) Discuss the phase shift method of generating DSBSC signal, consisting of the lower side band, with a neat block diagram. (7)
- (c) Why is VSB used in Television ? (4)
4. (a) What are the limitations of direct method of FM generation ? (4)
- (b) Draw the complete block diagram of the Armstrong frequency modulation system and explain the function of the mixer and multipliers. Under what circumstances can we dispense with the mixer ? (7)
- (c) A carrier wave of 1 MHz frequency and amplitude of 3 Volts is frequency modulated by a sinusoidal modulating signal frequency of 500 Hz and of peak amplitude of 1 volt. The frequency deviation is 1 KHz. If the peak level of the modulating wave form is changed to 5V and the modulating frequency is changed to 2 KHz, write the expression for the modulated wave in both the cases. (4)
5. (a) What is meant by the term "tracking error" in a super-heterodyne receiver ? (4)
- (b) Draw the block diagram of a double conversion receiver. When is there a need for double conversion ? (7)
- (c) In a super heterodyne receiver used for the reception of signals in AM broadcast band, among the incoming signal frequency and local oscillator frequency, which is larger and why ? (4)
6. (a) Explain how a PLL can be used for FM demodulation. (7)
- (b) Discuss capture effect in FM receivers. (4)
- (c) How do pre-emphasis and de-emphasis provide extra noise immunity in FM. (4)
7. (a) Derive the transfer function of a High Pass Filter (using R and C) for the condition $RC \ll T$, where T is the time period of the signal applied. If a square wave is applied at the input of such a filter, draw the output waveform and output spectrum. (7)
- (b) What is the difference between noise factor and noise figure ? (4)
- (c) A tandem connection has three links each having a SNR of 60dB. What is the overall SNR ? (4)