

PART B — (5 × 16 = 80 marks)

11. (a) With suitable block diagrams and equations show how will you generate :
- (i) DSBSC and
 - (ii) VSB signals.

Or

- (b) A sine wave of frequency 10Hz is applied to a product modulator, together with a carrier wave frequency of 1 MHz. The modulator output is next applied to a resonant circuit. Determine the modulated wave after transmission through the circuit. Assume suitable data.
12. (a) A carrier wave of frequency 80 MHz is frequency modulated by a sine wave amplitude of 20 volts and frequency of 80 KHz. The frequency sensitivity of the modulator is 20 KHz/vdf.
- (i) Determine the approximate bandwidth of the FM wave by Carson's rule.
 - (ii) Determine the bandwidth by transmitting only those side frequencies whose amplitude exceed 1% of the unmodulated carrier amplitude (use the universal curve/ideal condition).

Or

- (b) Describe how FM wave is generated by the indirect method and give a suitable demodulating scheme for the same.
13. (a) Summarise the characteristics of various noise found in a communication channel.

Or

- (b) Derive the equation for finding the probability density function of a one to one differentiable function of a given random variable.
14. (a) Explain the functioning of a superhetrodyne radio receiver and enlist its characteristics.

Or

- (b) Compare the performance of any two CW modulation schemes.
15. (a) (i) Prove how you use the source coding to increase average information per bit.
- (ii) Write the advantages of Huffman coding.

Or

- (b) Write short notes on :
- (i) Lossy source coding
 - (ii) S/N trade off.