2911N889

Candidate's Seat No :_____

B.Sc. Sem.-5 Examination

Ele-304

Electronic Communication

Time : 2-30 Hours] **Sepetmber 2024** **[Max. Marks : 70**

Instructions : (1) All questions are compulsory.

(2) All questions carry equal marks.

1 (a) Define amplitude modulation. Derive an expression for amplitude modulated wave. Also explain the side-frequencies. 7

(b) Derive the equation for rms voltage and current of the modulated wave. The rms antenna current of a radio transmitter is 10A when unmodulated, rising to 12A when the carrier is sinusoidally modulated. Calculate the modulation index. 7

OR

1 (a) Explain the trapezoidal method of monitoring modulation. 7

(b) What do you mean by demodulation? Explain diagonal peak clipping in detail. 7

2 (a) Obtain an expression for the frequency modulated wave, when the modulating wave is a sine-wave. Also draw the necessary waveforms. 7

(b) What is phase modulation? Derive the expression for phase modulated wave. 7

OR

2 (a) Discuss the frequency spectrum and band width of a frequency modulated wave. 7

(b) Explain the equivalence between FM and PM using necessary equations. 7

3 (a) Explain the basic principle of antenna and how transmission of E. M. wave takes place. 7

(b) Explain, antenna pattern, radiation resistance, radiation effiency and beam width of an antenna. 7

OR

3 (a) Explain the principle of loop aeriel and obtain the expression for the output voltage. 7

(b) Write a note on Yagi antenna. 7

4 (a) Explain the fixed satellite service in detail. 7

(b) Draw the block diagram of satellite communication. Earth station and explain it. 7

OR

4 (a) Write a note Indian Domestic Satellite (INSAT). 7

(b) Write a note on television. 7

5 Answer the following in a sentence or two (Any seven) : 14

(1) Define modulation index.

(2) Write the equation for the average power in an amplitude modulated wave.

(3) Give the equation to avoid negative peak clipping.

(4) What is frequency deviation constant?

(5) What is the unit of frequency deviation constant?

(6) Give the Carson's rule of bandwidth for FM.

(7) What is a folded dipole?

(8) Draw the radiation pattern of Ferrite rod antenna.

(9) In a _____ antenna the two ends are at equal potential relative to the mid-point.

(10) Give the full form of LNA and VHRR.

(11) What is a geosynchronous orbit?

(12) Why is the downlink frequency lower than the uplink frequency?
