0411E1028

Candidate's Seat No : _____

B.Sc. Sem.-5 Examination

304 - Electronics

Time : 2-30 Hours] **November-2025** **[Max. Marks : 70**

Instructions : (1) All question carry equal marks.
(2) All questions are compulsory.

1 Derive the equation for sinusoidally amplitude modulated wave. Explain the frequency spectrum of the modulated wave. 14

OR

1 Explain the trapezoidal method of monitoring modulation. In a trapezoidal pattern displaying modulation, the length of the long vertical side is 5cm, and of the short vertical side, 2cm. Determine the modulation depth. 14

2 Derive an equation of sinusoidally frequency modulated wave and explain its frequency spectrum. 14

OR

2 Derive an expression for average power in sinusoidal FM. A 15-Watt unmodulated carrier is frequency modulated with a sinusoidal signal such that the peak frequency deviation is 6 KHz. The frequency of the modulating signal is 1KHz. Calculate the average power output by summing the powers for all of the side frequency components. 14
(Given : $J_0 = 0.15$, $J_1 = 0.28$, $J_2 = 0.24$, $J_3 = 0.11$, $J_4 = 0.36$, $J_5 = 0.36$, $J_6 = 0.25$).

3 Explain the basic principle on which the antenna works. 14

OR

3 Describe the loop antenna in detail and explain how it can be used for direction finding. 14

4 Write a note on INSAT. 14

OR

4 Describe in detail the earth station. 14

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

(1) Which are the basic types of modulation?
(2) Draw the circuit of a basic detector used for amplitude modulation.
(3) Define modulation depth.
(4) What is frequency deviation constant?
(5) What is the unit of frequency deviation constant?
(6) What is phase modulation?
(7) What is a dipole?
(8) Define beam-width of antenna.
(9) Define radiation resistance of antenna.
(10) What is a geosynchronous orbit?
(11) What is the periodic time of a geostationary orbit?
(12) What is the full form of LNA?