(3 Hours) **[Total Marks : 80]**

N.B. : 1. Question **One** is **Compulsory.**
2. Solve any **Three** out of remaining.
3. **Draw** neat and **clear** Diagrams.
4. Assume suitable **data** if required

Q.1. Attempt the following

A. Represent an AM signal both in time domain and frequency domain giving their mathematical equation for e_{AM}. 05

B. List the ideal and practical characteristics with their values for an op-amp. 05

C. What is DC load line? What is the importance of Q-point selection on a DC load line? 05

D. What are the differences between PAM, PWM and PPM? 05

Q.2.

A. Explain with neat diagram, the working of Hartley Oscillator using transistor. 10

B. Describe the working of class A and Class C power Amplifier in detail with relevant diagrams. 10

Q.3.

A. Explain the application of op-amp as differentiator. 10

B. Explain the need of biasing and stabilization. In a Silicon transistor circuit with a fixed bias, V_{CC}=9V, R_C=0.5KΩ, R_B=60KΩ, β=60, V_{BE}=0.7V. Find the operating point on DC load line. 10

Q.4.

A. What is the role of multiplexing in communication system? Explain TDM in detail. 10

B. Explain how Op-Amp can be used as inverting summer. 10

Q.5.

A. Derive the formula of total power in AM. An AM signal has a total power of 48 Watts with 45% modulation. Calculate the power in the carrier and the sidebands. 10

B. Draw Input and output characteristics of CE Configuration. 05

C. Explain Zero Crossing Detector using Op-amp 741. 05

Q.6.

A. Define measures of information. A source puts out one of five possible symbols once every millisecond. The probabilities of these symbols are 1/2, 1/4, 1/8, 1/16 and 1/16. Find information rate and Entropy. 10

B. Draw waveforms of natural and flat top sampling signal for a given sine wave signal 05

C. Draw block diagram of super-heterodyne receiver with waveforms for each block. 05

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