(3 Hours)   [Total Marks : 80]

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

Q.1. Attempt the following

A. Explain with diagram Input and output characteristic of Common base configuration	5
B. List the ideal Characteristic of op-amp	5
C. Calculate the percent power saving an SSB signal if the AM wave is modulated to a depth of (a) 100 % and (b) 50%	5
D. Define the term Information theory. Give definitions for Information Rate and Entropy	5

Q.2. A. For the circuit shown in Figure below calculate V_{CB}, I_E, and I_B if ß=100   10
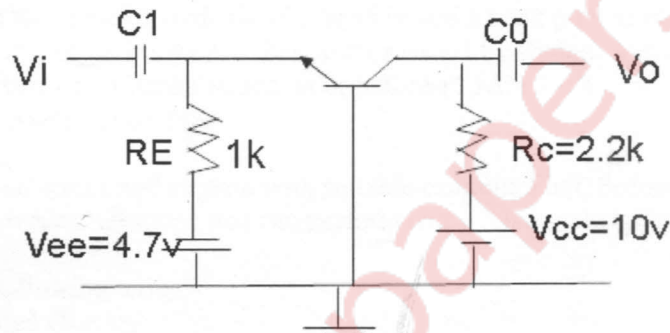
B. Explain how op-amp can be used as a differentiator.   10

Q.3. A. What do you mean by Zero Crossing detector? Explain with diagram   5
B. Write Short note on generation of FM by Armstrong method.   5
C. Use op-amp IC741 to realize the expression
$V0=5V_1+2V_2-3V_3$ 5
D. What is a Nyquist criteria? What is its significance   5

Q.4. A. Explain Delta Modulation with neat diagram and waveforms after each block.   10
B. An AM signal appears across a 50 Ω load and has the following equation   10
$v(t)=12(1+\sin 12.566 \times 10^3 t)\sin 18.85 \times 10^8 t$ volts
1. Sketch the envelope of this signal in time domain
2. Calculate modulation index, sideband frequencies, total power and bandwidth

Q.5. A. Compare PAM,PWM and PPM pulse modulation techniques   10
B. Explain the generation of DSBSC using Balance modulator   10

Q.6. A. What do you mean by multiplexing? Explain TDM   10
B. List down various parameters of op-amp with their practical values for IC741.   10
Explain common mode gain and differential mode gain.

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