

(3 Hours)

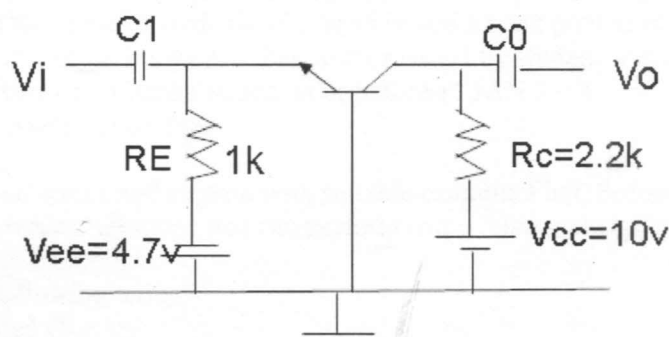
[Total Marks : 80]

- 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 $\beta=100$ 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 $V_0=5V_1+2V_2-3V_3$ 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 50Ω load and has the following equation $v(t)=12(1+\sin 12.566 \times 10^3 t)\sin 18.85 \times 10^8 t$ volts 10
 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.
