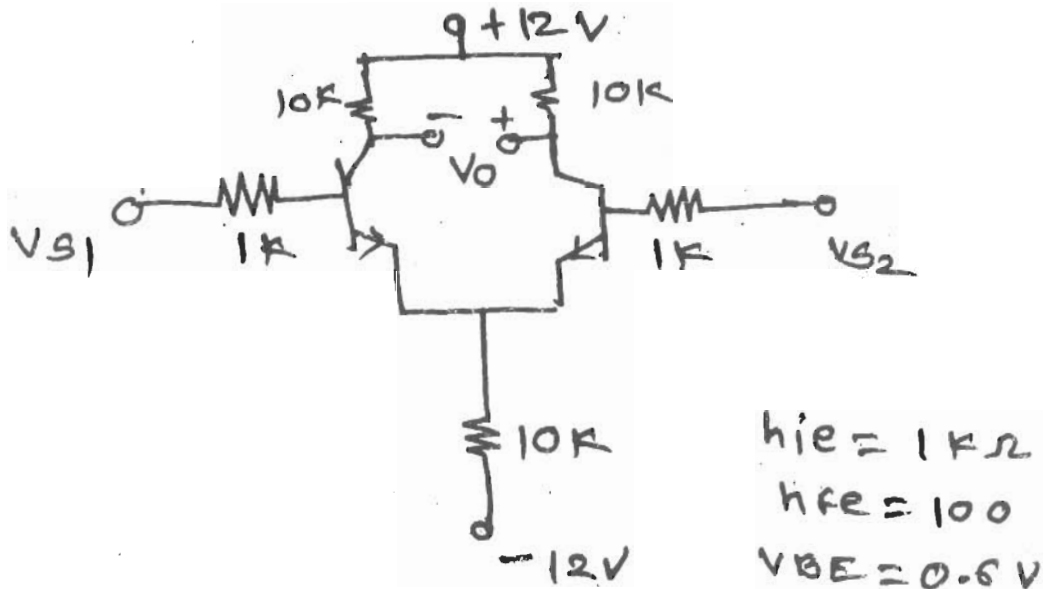


(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.
 (2) Solve any four questions from remaining six questions.
 (3) **Figures to the right** indicate full marks.
 (4) Assume suitable data if necessary.

1. (a) Explain the working of a Non-inverting adder using Op-amp. 5
- (b) Explain three terminal voltage regulator. 5
- (c) State and explain Barkhausen criterion for oscillator. 5
- (d) Explain Practical integrator. 5
2. (a) For differential amplifier find I_{CQ} , V_{CEQ} , A_d , A_c and CMRR. 10



- (b) Explain internal block diagram of monostable multivibrator using IC 555 and explain one application of it. 10
3. (a) Explain instrumentation amplifier using 3 Op-amp. Find the expression for output voltage. 10
- (b) Design astable multivibrator using IC 555 for $F_O = 1$ kHz, duty cycle = 25%. 10
4. (a) Design a first order lowpass filter for cut-off frequency of 1 kHz and pass band of 10. 10
- (b) Draw and explain the working of a triangular and square wave generator using Op-amp. 10
5. (a) What are advantages of active filters? With the help of circuit diagram, explain the operation of second order low pass filter. 10
- (b) Design Wein bridge oscillator for frequency of 1 kHz. 10

6. (a) Design a voltage regulator using IC 723 for the following specifications :— 10
 $V_o = 5\text{ V}$, $I_o = 100\text{ mA}$, $I_{sc} = 150\text{ mA}$, $V_{\text{sense}} = 0.7\text{ V}$.
- (b) A 6 bit DAC has an input 100101 and 10 V reference voltage. Find — 10
(i) Output Voltage
(ii) Conversion Resolution.
7. Explain the following :—
- (a) Switching mode regulator 5
(b) Schmitt trigger in Non-inverting mode 5
(c) Successive approximation type ADC 5
(d) RC phase shift oscillator. 5
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