Con. 3026-11.

SE IT -Sem -III
Eelctoonics Devices and
Lineor RK-1326

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
  (2) Solve any **four** questions from remaining **six** questions.
  (3) Assume **suitable** data wherever **necessary**.

1. (a) For the common base circuit in **Figure 1** the transistor parameters are $h_{ib} = 22\ \Omega$, **15**
    $h_{fb} = -0.98\ h_{ob} = 0.49\ \mu A/v\ h_{rb} = 2.9 \times 10^{-4}$. Calculate the values of the input
    resistance, output resistance, current gain and voltage gain for the given circuit.
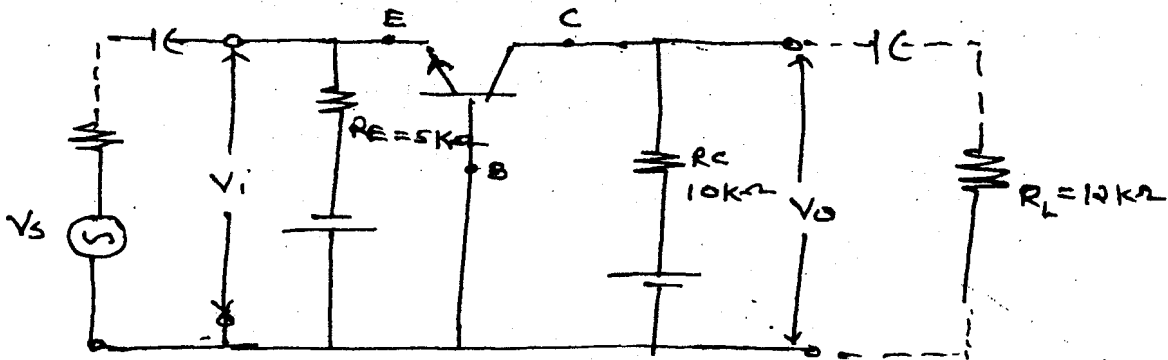
  (b) Write a note on current mirror circuit. **5**

2. (a) Show the use of OPAMP as an instrumentation amplifier. Derive the expression **10**
    for gain of an instrumentation amplifier.
  (b) How will you use OPAMP as on Schmitt trigger ? **10**

3. (a) Draw and explain internal architecture of Timer IC 555. **10**
  (b) Design voltage regulator using IC 723 for $V_o = 10V\ V_i = 12 \pm 10\%\ I_L$ max = 70 mA. **10**
    How will you boost the current to a level of 1Amp.

4. (a) Design ractangular wave generator using 7 IC 741 for following specifications **10**
    $V_o = \pm 1oV$
    Frequency = 10 KHz duty cycle = 60%.
  (b) Design Wienbridge oscillator for a frequency of 1 KHz. **10**

5. (a) Design astable multivibrator using IC 555 for a frequency of 1KHz duty **10**
    cycle = 60%, what modification you will do for duty cycle of 50%.
  (b) Explain in detail second order low pass filter. **10**

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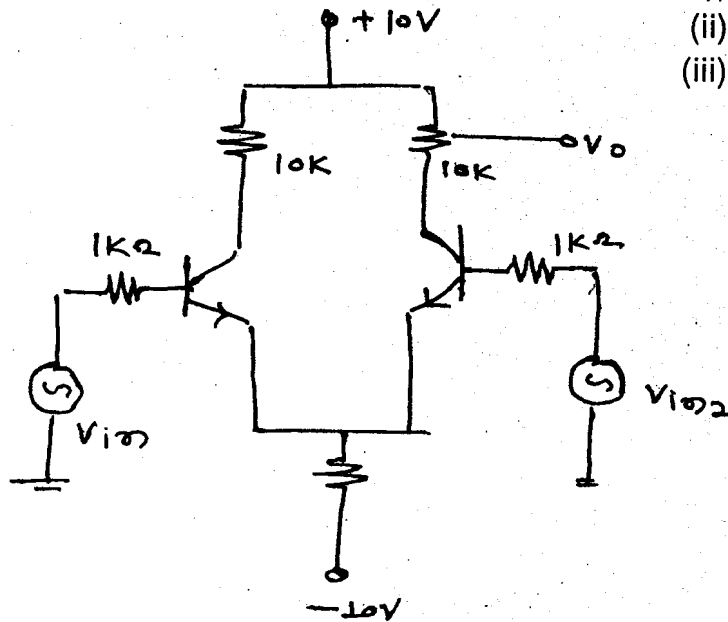
6. (a) For OPAMP explain following terms and give practical values :—   **10**
   (i) SVRR
   (ii) Slew rate
   (iii) CMRR.

(b) The specifications for the differential amplifier is given below. Determine the **10** following :—

(i) DC Bias Q point
(ii) Voltage gain Ad
(iii) Voltage gain Ac

Transistor data
$h_{ie} = 1k\Omega$ $h_{fe} = 100$
(neglect h_{oe} and h_{re})
$V_{BE} = 0.6$.

7. Write short notes on any **two** of the following :—   **20**
   (a) Stability factor of biasing circuit.
   (b) Successive approximation type ADC
   (c) Practical integrator and differentiator
   (d) Use of Timer as Frequency divider.