SE | IT | III (R) 13|5|13

~~EDC — I~~

EDLC

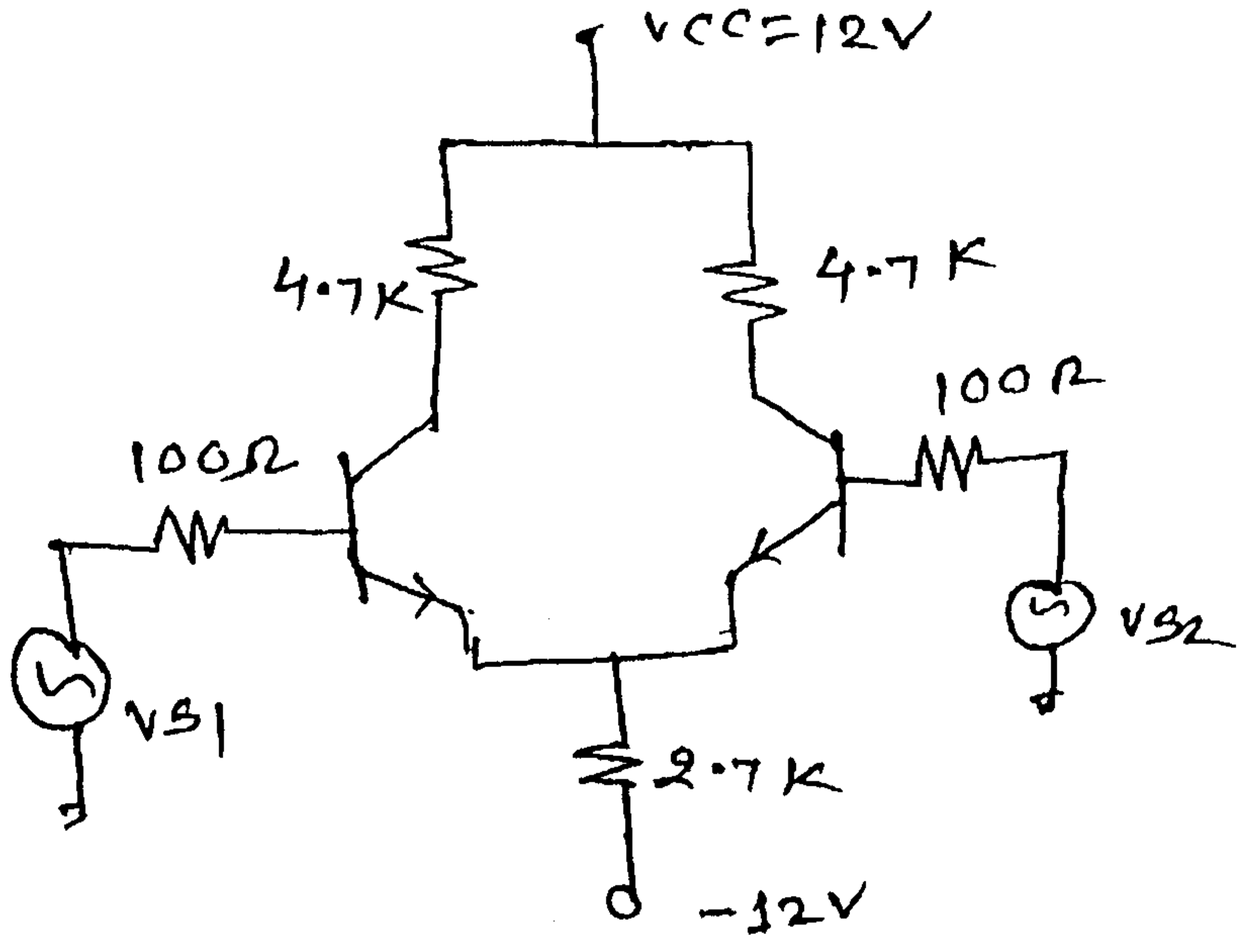
Con. 6463-13. **GS–6243**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) Draw **neat** labelled diagrams wherever **necessary**.
(4) Assume **suitable** data if **necessary**.

1. (a) Explain block diagram of op-amp **5**
   (b) Explain zero crossing detector **5**
   (c) Explain significance of CMRR for a differential amplifier **5**
   (d) Explain the basic principle of D to A converter. **5**

2. (a) Explain internal block diagram of astable multivibrator using IC 555 and explain the one application of it. **10**
   (b) For the differential amplifier find Ad, Ac, CMRR, Rin and Ro. **10**



β = dc = βac = 100
h_{ie} = 1k Ω

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3. (a) Draw the transfer characteristics of an n-channel JFET with the help of Schockley's expression and explain its significance. **10**
   (b) Design a wide bandpass filter for FL = 1KHz and passband gain equal to 4. Also find quality factor. **10**

4. (a) Draw the block diagram of an oscillator and explain the Barkhausen conditions to obtain sustained oscillations. **10**
   (b) Design a stable multivibrator using 555 for duty cycle 75% and output frequency 5 KHz. **10**

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5. (a) Explain the basic requirement for the instrumentation amplifier. Find the expression for output voltage using three op-amp. **10**

   (b) Explain the non-inverting Schmitt trigger and give the Schmitt trigger advantages over the conventional comparators. **10**

6. (a) Design a voltage regulator using I_c 723, $V_o = 5V$, $I_o = 50$ mA, Isc = 75 mA, vin = 15V. **10**

   (b) Design a R-C phase shift oscillator for output frequency 1 KHz. **10**

7. (a) Explain the averaging amplifier. **5**

   (b) Explain three terminal voltage regulator **5**

   (c) Explain dual slope ADC and state its advantages **5**

   (d) Explain 555 as a voltage controlled oscillator. **5**
