

F.E. (Semester - II) Examination, 2011  
**BASIC ELECTRONICS ENGINEERING**  
 (2008 Pattern)

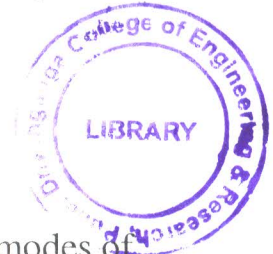
(For Students Admitted During the Academic Year 2008 - 2009)

Time : 3 Hours

Max. Marks : 100

- Instructions:**
- 1) Answer *any three* questions from *each* Section.
  - 2) Answers to the *two* Sections should be written in *separate* books.
  - 3) *Neat* diagrams must be drawn *wherever* necessary.
  - 4) *Black* figures to the *right* indicate *full* marks.
  - 5) *Use* of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is *allowed*.
  - 6) Assume *suitable* data, if *necessary*.

SECTION - I



1. A) Draw and explain the V-I characteristics of Ge diode in both the modes of operation. 4
- B) A bridge rectifier is applied with input from step down transformer having turns ratio 10:1. Input applied to transformer is 230V, 50 Hz. If the diode forward resistance is  $3\Omega$ , secondary resistance is  $12\Omega$  and load resistance is  $1900\Omega$ . Calculate : 1) Ripple factor 2) % efficiency. 4
- C) Explain the working of common cathode 7-segment LED display with the status of each segment for the digits from 0 to 9. 8

OR

2. A) Draw the neat circuit diagram of zener voltage regulator and explain its working. 4
- B) Explain with circuit diagram the working of centre-tap transformer full wave rectifier with capacitor filter. Draw appropriate waveforms. 8
- C) A  $S_i$  PN junction has  $I_0 = 30$  nA at a room temperature of  $300^\circ\text{K}$ . Calculate the junction forward voltage required to produce current of a) 0.1 mA b) 10 mA. 4

P.T.O.



3. A) Define  $\alpha_{dc}$  and  $\beta_{dc}$ . Derive the expression for their inter-relationship. 6
- B) Draw and explain two transistor analogy of SCR. 4
- C) A n-channel JFET has  $I_{DSS} = 8 \text{ mA}$  and  $V_P = -4 \text{ V}$ . a) If  $I_D = 4 \text{ mA}$  calculate the value of  $V_{GS}$  b) Calculate  $V_{DS(sat)}$  for  $I_D = 4 \text{ mA}$ . 6

OR

4. A) Derive the equation of DC load line for a CE amplifier circuit given in the fig. 4.1. Explain the effect of position of Q-point on the working of this amplifier. 6

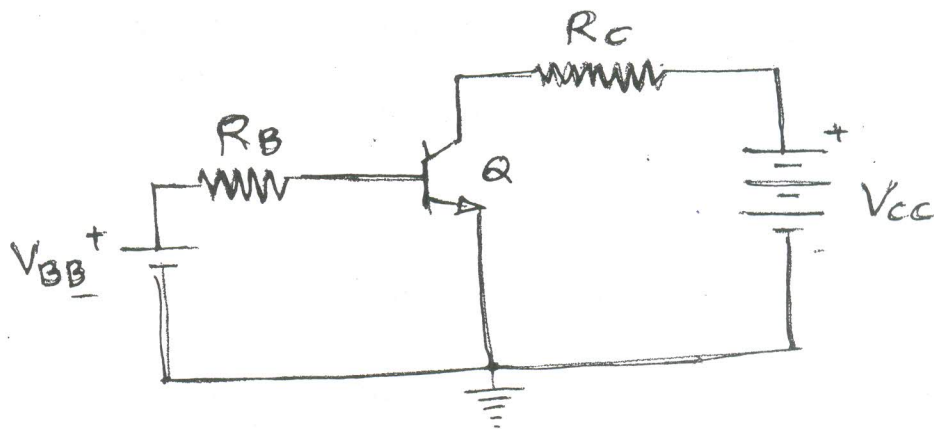


Fig. 4.1

- B) Explain the construction, working and characteristics of DIAC. 6
- C) Derive the equation  $\mu = g_m \times r_d$ . 4
5. A) Draw the circuit diagram and explain the working of an inverting summing amplifier. 7
- B) Draw the neat circuit diagram and derive the output equation of differentiator circuit. 7
- C) Give the typical values of following parameters for IC 741 : 1)  $R_i$   $\Omega$  2) Input Bias current 3) Slew rate 4) CMRR. 4

OR

