



RM-6583

B. E. - II (Sem. IV) (TT/TP) Examination

May / June - 2010

Basic Electronics

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

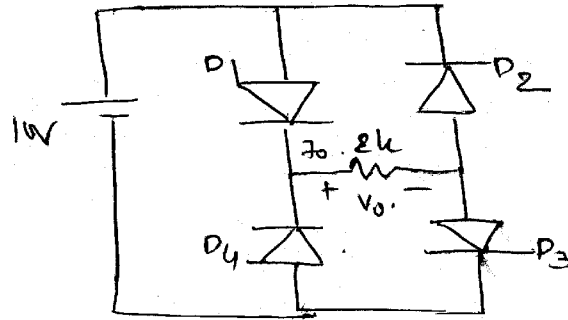
नीचे दृष्टावेव निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 2 (Sem. 4) (TT/TP)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Basic Electronics"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="5"/> <input type="text" value="8"/> <input type="text" value="3"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="1&amp;2"/>	<input type="text"/>
	Student's Signature

- (2) Attempt all questions.
- (3) Figures on right side indicate full marks.
- (4) Support your answer with neat sketch.
- (5) Assume necessary data, if required.
- (6) Answer to the two sections must be in separate answer book.

**SECTION - I**

- 1 (a) Answer the following : 10
- (i) Define PIV.
  - (ii) The best method for transistor biasing is \_\_\_\_\_.
  - (iii) During avalanche breakdown the electric field produced across the junction of diode is \_\_\_\_\_.
  - (iv) Relation between  $\alpha$  and current gain  $\beta =$  \_\_\_\_\_.
  - (v) The ripple factor of a half wave rectifier is \_\_\_\_\_.
  - (vi) The depletion region is called as \_\_\_\_\_ region.
  - (vii) The best method of biasing is \_\_\_\_\_.
  - (viii) Improper biasing of a transistor that lead to \_\_\_\_\_.
  - (ix) Rectifier converts ac into \_\_\_\_\_.
  - (x) Zener breakdown mechanism needs relatively \_\_\_\_\_ electric field compared to avalanche breakdown.

- (b) For the circuit shown in figure 1 find  $V_o$  and  $I_o$ . 5  
All diodes have  $V_r=0.7$  V.

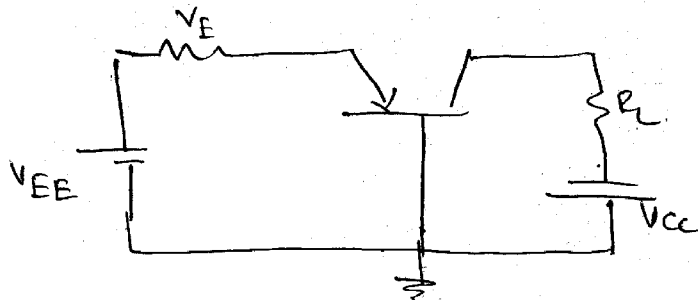


(Figure 1)

- (c) Explain how zener diode can work as a voltage regulator. 5
- 2 (a) Derive the relationship between  $\alpha$  and  $\beta$  for common emitter configuration with proper diagram. Derive equation of current gain  $\beta$ . 7
- (b) Design a full wave rectifier with LC filter to provide 8  
gv DC at 100 mA with a maximum ripple of 2% line  
frequency  $F = 60$  Hz. 8

OR

- 2 (a) Draw the circuit for center tapped full wave rectifier and explain its working. Also derive the expression for its rectifier efficiency. 7
- (b) A transistor having  $\alpha=0.96$  is placed in common base configuration with a load resistance of  $5\text{ k}\Omega$ . If  $R_E=80\ \Omega$ . Find the value of amplifier current, voltage and power gain. 8



(Figure 2)

- 3** Attempt any **three** : **15**
- (a) Explain common base configuration of transistor. Draw input and output characteristic of CB amplifier.
  - (b) Draw and explain inductor coupled class-A power amplifier.
  - (c) Zener diode as a voltage stabilize.
  - (d) Short note on voltage doubler.
  - (e) For transistor  $I_E = 5\text{mA}$ ,  $I_C = 4.95 \text{ mA}$ ,  $I_{CEO} = 200 \mu\text{A}$   
Calculate  $\beta$  and  $I_{CBO}$ .

## SECTION - II

- 4** (a) Answer the following : **10**
- (i) Define the following terms:
    - (a) Work function
    - (b) Electron Emission
  - (ii) List out the names of different temperature measuring devices.
  - (iii) In C.R.O. Lissajous pattern is used for measurement of \_\_\_\_\_.
  - (iv) Thermocouples are \_\_\_\_\_.
    - (a) Passive transducers
    - (b) Active transducers
    - (c) Active and passive transducers
    - (d) Output transducers
  - (v) LC oscillator cannot be used to produce \_\_\_\_\_ frequencies.
    - (a) high
    - (b) Audio
    - (c) Very low
    - (d) Very high

- (b) Describe photo conductive, photovoltaic and photoemissive effect. 6
- (c) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with  $L_1 = 58.6 \mu\text{H}$  and  $C_1 = 300 \text{ PF}$ . Calculate the frequency of oscillations. 4
- 5** (a) Draw the block diagram of C.R.O. Explain the function of each block. State the application of C.R.O.
- (b) What is a L.V.D.T? Explain its use as a displacement transducer. 7
- OR**
- 5** (a) Explain the principle, working construction and applications of thermistors. 8
- (b) Draw and explain RC phase shift oscillator. 7
- 6** Write short notes on any **three** : 15
- (a) Digital computer
- (b) Photo Diode
- (c) V.T.V.M.
- (d) Cathode ray tube
- (e) Astable Multivibrator