

**B. TECH  
(SEM IV) THEORY EXAMINATION 2017-18  
BASIC ELECTRONICS DEVICES**

*Time:3 Hours**Total Marks:100***Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION - A****1. Attempt *all* questions in brief. 2 x 10 = 20**

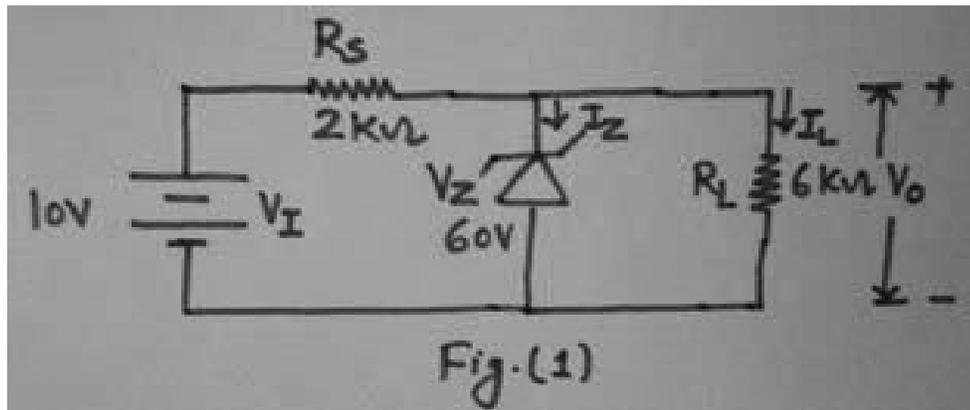
- a. Draw the V-I characteristics of an ideal PN diode.
- b. Why is silicon preferred over germanium in the manufacture of semiconductor devices?
- c. Write the relation between  $\alpha$  and  $\beta$ .
- d. Draw the symbol of PNP transistor and NPN transistor.
- e. Convert the following:  
 $(2374)_{10} = (?)_2$
- f. What is the dynamic resistance of JFET?
- g. Draw the circuit diagram of half wave rectifier.
- i. What are the universal gates?
- j. Give the names of at least three devices used for photo detection.

**SECTION - B****2. Attempt any *three* of the following: 10 x 3 = 30**

- a. Differentiate between zener diode and avalanche breakdown in Zener diode. Give voltage value for which zener and avalanche breakdown take place in zener diode.
- b. Draw the input and output characteristics of CE configuration.
- c. Explain the construction and working principle of N channel enhancement type of MOSFET.
- d. Draw the working principle of tunnel diode in all regions with neat diagram (show valley point).
- e. Draw the characteristic of SCR and DIAC.

**SECTION - C****3. Attempt any one part of the following: 10 x 1 = 10**

- (a) For the circuit of fig. (1) Determine
  - (i) the output voltage  $V_0$
  - (ii) the current  $I_L$  through  $R_L$



(b) Draw the VI characteristics of PN junction diode.

4. Attempt any one part of the following: 10 x 1 = 10

(a) Define following region of transistor:

(i) Active (ii) Cut off (iii) Saturation

(b) Draw the D.C. load line for NPN CE amplifier and also find operating point coordinates.

5. Attempt any one part of the following: 10 x 1 = 10

(a) Simplify the expression  $Y = \sum m(3,4,5,7,9,13,14,15)$  using K-map method.

(b) How many NAND gates are required to construct EX-OR gate? Explain with proper diagram.

6. Attempt any one part of the following: 10 x 1 = 10

(a) Explain the working of zener diode using voltage regulator with a neat sketch.

(b) Explain the voltage divider biasing circuit using NPN transistor.

7. Attempt any one part of the following: 10 x 1 = 10

(a) Express the function  $Y = B + A'C$  in

(i) Canonical SOP

(ii) Canonical POS form.

(b) Explain universal gates with symbol and truth table.