

Roll No.

24024

**B. Tech. 3rd Semester (EEE)
Examination – December, 2018**

ELECTRONIC DEVICES AND CIRCUITS

Paper : EE-201-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is *compulsory*. Attempt any *one* question from each Section.

1. (i) What are the characteristics of good amplifier ? 5
- (ii) Define drift velocity of charge carriers. Does it depends on length of the conductor ? 5
- (iii) Define mobility of electrons in a conductor. Prove that conductivity of conductor is directly proportional to concentration of free electrons. 5
- (iv) Discuss the *two* applications of LED. 5

SECTION – A

2. (a) Explain the meaning of valence band, conduction band, and forbidden energy gap. 10

- (b) State and explain conductivity, collision time, relaxation time. 10
3. (a) State and discuss various factors which effect the conductivity of materials. 10
- (b) Explain super conductivity and applications of conducting materials. 10

SECTION – B

4. (a) The barrier potential developed across an open circuit PN junction aids the flow of minority carriers. Explain how the current due to this flow of charge carrier is counter balanced. 10
- (b) Explain how the process of zener breakdown occurs in PN junction diode. How it is different from process of avalanche breakdown ? 10
5. Write a short note on :
- (a) Planer technology for device fabrication. 10
- (b) Diffusion and transition capacitance in diode. 10

SECTION – C

6. (a) A BJT is connected in common base configuration and is biased in such a way that $I_E = 2\text{mA}$. If its DC alpha is 0.98. Calculate the values of I_C and I_B . 10
- (b) Explain why in the active operation the base current I_B is much smaller than I_C or I_E . What is the relation between these currents ? 10

7. (a) Explain briefly the working of enhancement type MOSFET. 10
- (b) For JFET define I_{DSS} , $V_{GS(0)}$ and V_P . 10

SECTION – D

8. (a) State and explain the *two* applications of LEDs. 10
- (b) State the special features of Tunnel diode. Explain the applications of tunnel diode. 10
9. Write notes on : 20
- (a) TRIAC
- (b) NPN diode