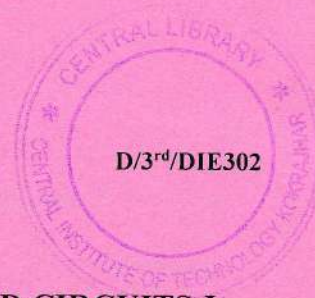


Total number of printed pages:3



2021

## ELECTRONICS DEVICES AND CIRCUITS-I

Full Marks: 100

Time: Three hours

*The figures in the margin indicate full marks for the questions.*

*Answer any five questions.*

1.

- a) Explain the behaviour of p-n junction under no bias. 6
- b) What is biasing of p-n junction diode? 2
- c) Explain the operation of forward biased diode. 6
- d) Explain breakdown of diode due to Avalanche effect. 6

2.

- a) Draw and explain the V-I characteristics of a p-n junction diode. 6
- b) Draw the circuit and explain the operation of a half wave rectifier. 8
- c) Derive the expression for the D.C. load current for half wave rectifier. 6

3.

a) What is transistor? Explain the working principle of npn transistor. 2+8=10

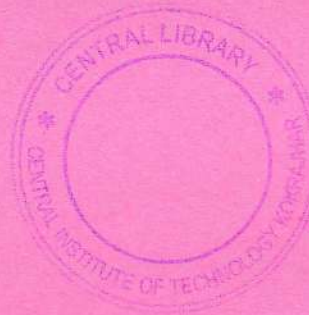
b) Explain different types of transistor circuit configuration. 6

c) A transistor has  $I_B=100 \mu\text{A}$  and  $I_C=2 \text{ mA}$ . Find 4

i)  $\beta$  of the transistor

ii)  $\alpha$  of the transistor

iii) Emitter current  $I_E$



4.

a) Explain the operation of n-channel JFET. 10

b) What is the difference of Enhancement MOSFET and Depletion MOSFET? Explain the operation of N-channel E-MOSFET. 2+8=10

5.

a) Give the difference between voltage amplifier and power amplifier. 4



b) Explain the following 6+6= 12

i) Class A power amplifier

ii) Class B power amplifier

c) Explain Harmonic distortion in amplifiers. 4

6.

a) Differentiate between series and shunt voltage regulator. 8

b) Explain the block diagram of basic three terminal IC regulator. 8

c) Define Line regulation and Load regulation. 4

7. Write short notes on (any four): 5X4=20

- i) Full Wave Rectifier
- ii) Zener Breakdown
- iii) Power amplifier
- iv) Adjustable voltage regulator
- v) Field Effect Transistor.

