Total number of printed pages: 2 **D/3rd/DIE302**

2024

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) What is semiconductor? Write the types of semiconductor with examples. 6

   b) What is diode? With a neat diagram explain the working principle of diode in forward biased condition. 2+8=10

   c) Explain the V-I characteristics of a diode. 4

2. a) What is rectifier? Explain the working principle of full wave rectifier with the waveforms. 2+8=10

   c) Derive the expression for the average value of current and average voltage across load for half wave rectifier. 10

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

   b) Draw different transistor configuration. 6

   c) Write true or false in the following statement: 4

   i) A NPN transistor conducts when Collector is positive and the emitter is negative with respect to the base.

   ii) Common emitter is commonly used because the current gain is maximum.

   iii) Base is the least doped region in a transistor.

   iv)Emitter-base junction is forward biased when transistor is used as an amplifier.

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

   b) Explain Enhancement and Depletion type MOSFET. 10

5. a) Differentiate between A, B and C power amplifier. 6

b) Show that maximum collector efficiency of a class A transformer coupled power amplifier is 50%. 8

c) Write true or false: 3

(i) Transformer coupling is generally employed in power amplifier.

(ii) In a class A operation, the operating point is generally located at cut off point of the D.C. load line.

(iii) The output transformer used in a power amplifier is a step-down transformer.

d) Write the difference between voltage amplifier and power amplifier. 3

6. a) Draw and explain the block diagram of a voltage regulator. 8

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

c) Define Line regulation and Ripple Rejection. 4

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

i) Diode Breakdown

ii) Half Wave Rectifier

iii) Push-Pull Power amplifier

iv) Transistor as Amplifier

v) Field Effect Transistor.

****