

II B. TECH I SEMESTER REGULAR EXAMINATIONS, FEB - 2022
ELECTRONIC DEVICES AND CIRCUITS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours**Max. Marks: 70**

Note: Answer ONE question from each unit (5 × 14 = 70 Marks)

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UNIT-I

1. a) Explain about the Diffusion and Drift currents for a semiconductor. [7M]
- b) Narrate the operation of Tunnel diode with V-I characteristics. [7M]

(OR)

2. a) Discuss about the formation of depletion region in a PN junction. [7M]
- b) With the help of V-I characteristics explain the principle of PN junction diode. [7M]

UNIT-II

3. a) How the Zener diode is used for regulation purpose? Discuss. [7M]
- b) Draw the circuit diagram of full-wave rectifier with inductor filter and explain it. [7M]

(OR)

4. a) An L-C filter is to be used to provide a dc output with 1% ripple filter from a full-wave rectifier operating at 50Hz. Assume  $L/C = 0.01$ , determine the required values of L and C. [7M]
- b) What is the need for filters in power supplies? Explain in detail. [7M]

UNIT-III

5. a) Distinguish details about drain and transfer characteristics of a JFET. [7M]
- b) List out comparisons of CB, CE and CC configurations. [7M]

(OR)

6. a) Draw the circuit diagram of CB amplifier and explain its operation in detail. [7M]
- b) Draw the constructional features and working of depletion MOSFET. [7M]

UNIT-IV

7. a) What is Biasing? Explain the need of it. List out different types of biasing methods. [7M]
- b) Explain the collector to base bias method along with circuit diagram and derive the stability factor "S" for it? [7M]

(OR)

8. a) Draw and explain the self-bias circuit for BJT and derive for the stability factor 'S'. [7M]
- b) In a self-bias circuit containing  $R_1 = 50\text{K}\Omega$ ,  $R_2 = 25\text{K}\Omega$ ,  $R_e = 1\text{K}\Omega$ ,  $R_c = 3\text{K}\Omega$ ,  $\beta = 90$ ,  $V_{CC} = 12\text{V}$ ,  $V_{BE} = 0.7\text{V}$ . Find the operating point, S and S'. [7M]

UNIT-V

9. a) Draw the h-parameters equivalent circuit for a common base amplifier and derive the expressions for  $A_i$ ,  $R_i$  and  $A_v$ . [7M]
- b) Derive the expression for  $A_v$  for common source J-FET amplifier. [7M]

(OR)

10. a) Define h-parameters. How they will be used? Derive units for them. [7M]
- b) Using small signal analysis derive the expressions for  $A_v$  for common drain J-FET amplifier [7M]

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