

Code No.: R22EC301PC

R22

H.T.No.

8

R

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

II–B.TECH–I–Semester End Examinations (Supply) - June- 2025

ELECTRONIC DEVICES AND CIRCUITS

(ECE)

[Time: 3 Hours]

[Max. Marks: 60]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 10 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(10 Marks)

1. a) Define the term Electronics. [1M]
- b) What is the effect of temperature on V-I characteristics of a PN Junction Diode? [1M]
- c) Why CE configuration is most widely used in amplifier circuits? [1M]
- d) Define BJT thermal runaway. [1M]
- e) What is Pinch off voltage in FETs? [1M]
- f) Draw the symbols for various MOSFETs. [1M]
- g) Draw the simplified h- parameter model of CE Transistor. [1M]
- h) Express the simplified h – parameters of CC amplifier. [1M]
- i) Draw the small signal model of JFET amplifier. [1M]
- j) List the key differences between Enhancement mode and Depletion mode MOSFET amplifier. [1M]

PART-B

(50 Marks)

- 2.a) Explain in brief about the P-N junction diode in forward bias condition along with V-I characteristics. [5M]
- b) The reverse bias saturation current of the Ge diode is $2\mu\text{A}$ at room temperature of 25°C and increases by a factor of 2 for each 10°C temperature rise. Find the saturation current of the diode at a temperature of 75°C . [5M]

OR

3. Draw the circuit of a half wave rectifier and explain its operation. Derive the expression for V_{dc} , V_{rms} , ripple factor and efficiency. [10M]
4. Why biasing is necessary in BJT amplifiers? Describe different biasing techniques in BJT amplifier circuit. [10M]

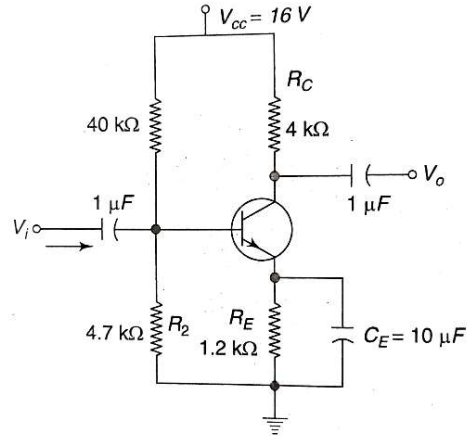
OR

5. Explain the concept of thermal run away in BJT amplifiers. [10M]
 6. Explain in detail about N – Channel JFET Volt - Ampere characteristics. [10M]
- OR**
7. Explain the working principle of UJT relaxation Oscillator. [10M]

8. Explain in detail about response characteristics of CE amplifier in low frequency region. [10M]

OR

9. Determine the input impedance, output impedance, voltage gain and current gain of the CE amplifier using h-parameters model equivalents for the transistor with $h_{ie} = 3.2\text{k}\Omega$ and $h_{fe} = 100$ at the operating conditions. [10M]



10. Using simplified small signal model of JFET and derive the relationship in between its parameters. [10M]

OR

11. Explain with the help of neat diagrams, the structure and operation of an n-channel depletion mode MOSFET. [10M]
