

**CMR ENGINEERING COLLEGE: : HYDERABAD**  
**UGC AUTONOMOUS**

**II-B.TECH-II-Semester End Examinations (Supply) -December- 2025**  
**ANALOG AND DIGITAL ELECTRONICS**  
**(Common for CSE,CSC)**

**[Time: 3 Hours]**

**[Max. Marks: 60]**

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

Part A is compulsory which carries 20 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 static and dynamic resistance of P-N diode. [1M]
- b) What is rectifier? [1M]
- c) Define operating point. [1M]
- d) Write about thermal runaway. [1M]
- e) Define FET. [1M]
- f) Define demorgan's law. [1M]
- g) Define Minterm & Maxterm. [1M]
- h) What are called don't care conditions? [1M]
- i) Define Flip Flop. [1M]
- j) What is shift Register? [1M]

**PART-B**

**(50 Marks)**

2. Explain the working of a PN junction diode in forward bias and reverse bias and plot the V-I characteristics. [10M]

**OR**

3. Describe the working principle of full wave rectifier with center tapped transformer and derive the expressions for the ripple factor, efficiency,  $V_{dc}$ ,  $I_{rms}$ ,  $IL_{max}$  and  $V_{rms}$ . [10M]
4. Construct the circuit diagram of a transistor in CE configuration and explain the output characteristics with the help of different regions. [10M]

**OR**

5. Construct the circuit diagram of a single stage RC coupled Amplifier and discuss the steps used for designing it. [10M]

6. Explain principle of operation JFET and draw the V-I Characteristics. [10M]

**OR**

7. Determine all logic gates using NAND gates. [10M]

8. Simplify the following expression to sum of products using K-Map  $F(a,b,c,d)=\sum m(0,4,8,10,12,13,15) + d(1,2)$ . [10M]

**OR**

9. With the help of Logic diagram and Truth Table, discuss  $8 \times 1$  Multiplexer. [10M]

10. Construct a block diagram of Modulo 10 ripple counter and explain its timing diagram. [10M]

**OR**

11. Design a 4-bit universal shift register and explain its operation. [10M]

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