

Code No.: CS403ES

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

**II-B.TECH-II-Semester End Examinations (Supply) - July- 2024**  
**ANALOG & DIGITAL ELECTRONICS**  
**(Common to CSE, CSC)**

[Time: 3 Hours]

[Max. Marks: 70]

**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**

**(20 Marks)**

1. a) Classify Semiconductors. [2M]
- b) What is Peak Inverse Voltage? [2M]
- c) Draw the circuit symbols of PNP and NPN transistors. [2M]
- d) What is an amplifier? [2M]
- e) Give any two differences between BJTs and FETs. [2M]
- f) Draw the symbols of basic gates. [2M]
- g) What is Decoder? [2M]
- h) State the truth table for Half adder. [2M]
- i) Write the Differences between combinational and sequential logic circuits. [2M]
- j) Define Flip-flop and latch. [2M]

**PART-B**

**(50 Marks)**

2. With neat diagram explain the V-I characteristics of a PN junction diode in forward bias and reverse bias conditions. [10M]
- OR**
3. Draw the circuit diagram and explain the working of Full wave rectifier and derive the expressions for average value, rms value and rectification efficiency. [10M]
4. With neat sketch, explain the input and output characteristics of Common Base configuration. [10M]
- OR**
5. Compare and contrast between CE, CB and CC configurations. [10M]
6. Illustrate the construction and operation of n-channel JFET with neat diagrams. [10M]
- OR**
7. For each of the following expressions, construct the corresponding logic circuit using AND/OR/INVERT logic. [10M]  
i)  $Y=AB(C+D)$  ii)  $Z=(W+PQ)'$
8. Simplify the Boolean function using K-map. [10M]  
 $F(w, x, y, z) = \sum m(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$
- OR**
9. Implement a Full adder using half adder and or gate. [10M]

10. Explain the JK and Master slave Flip-flop? Give its timing waveform? [10M]

**OR**

11. Explain the working of 3-bit asynchronous up-down counter with necessary waveform and truth table. [10M]

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