

CMR ENGINEERING COLLEGE: : HYDERABAD

UGC AUTONOMOUS

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

ANALOG & DIGITAL ELECTRONICS

(Common to IT, CSM & AI&DS)

[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) Define the terms (i) Static Resistance (ii) Dynamic Resistance [2M]
- b) List the applications of PN junction diode. [2M]
- c) Compare CB, CE, CC configurations. [2M]
- d) What is thermal runaway? [2M]
- e) Define the pinch-off voltage. Why the name field effect is used for the device FET? [2M]
- f) State the important characteristics of TTL family. [2M]
- g) Define minterm. [2M]
- h) Draw the truth table of Full Adder. [2M]
- i) What is Race Around condition? [2M]
- j) What is state assignment? [2M]

PART-B**(50 Marks)**

2. Draw a half-wave rectifier circuit and explain its operation with its input and output waveforms along with derivations for ripple factor and efficiency. [10M]
- OR**
3. Explain the Operation of Tunnel Diode. [10M]
4. Explain input and output characteristics of transistor in CB Configuration. [10M]
- OR**
- 5.a) Explain various methods used for coupling of multistage amplifiers with their frequency response. [6M]
- b) Draw and explain equivalent circuit of transistor at low frequencies. [4M]
- 6.a) Draw the V-I characteristics of enhancement MOSFET and explain it. [6M]
- b) Explain the operation of TTL with neat diagram. [4M]
- OR**
7. Explain the construction and principle of operation of N-channel JFET and also draw Drain and transfer characteristics. [10M]
- 8.a) Express the function $(xy+z)(y+xz)$ in canonical SOP and POS forms. [5M]
- b) Implement the following Boolean function with a multiplexer. [5M]

$$F(A,B,C,D) = \Sigma(1, 3, 4, 11, 12, 13, 14, 15)$$
- OR**
9. Explain 2-bit magnitude comparator. [10M]
10. Explain the operation of SISO, SIPO, PISO and PIPO shift registers. [10M]
- OR**
11. Design a mod-10 asynchronous counter using JK flip flops. [10M]
