CBCS SCHEME

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18EC36

CMR INSTITUTE OF TECHNOLOGY BANGALORE

Third Semester B.E. Degree Examination, June/July 2025
Power Electronics and Instrumentation

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define power electronics and discuss the applications of power electronics. **(06 Marks)**
b. Explain the operation of SCR with VI characteristics. **(08 Marks)**
c. Discuss various types of turn ON methods for SCR. **(06 Marks)**

OR

2 a. Define commutation differentiate natural and forced commutation. **(06 Marks)**
b. With neat circuit diagram, explain the operation of full wave RC firing circuit for SCR. **(08 Marks)**
c. Discuss basic operation of UJT. **(06 Marks)**

Module-2

3 a. With neat circuit diagram, explain the operation of 1ϕ half wave phase controlled rectifier with resistive load. **(10 Marks)**
b. Explain the followings with respect to choppers :
i) Step up chopper
ii) Step down chopper. **(10 Marks)**

OR

4 a. Classify the choppers based on the operating quadrants and discuss. **(10 Marks)**
b. Explain the operation of full wave phase controlled rectifier with resistive load. **(10 Marks)**

Module-3

5 a. Explain the operation of 1ϕ full bridge inverter with R_L load. **(10 Marks)**
b. Explain the operation of buck converter with circuit diagram. **(10 Marks)**

OR

6 a. Discuss the various types of static error in measurements. **(10 Marks)**
b. With neat diagram, explain multirange ammeter and voltmeter. **(10 Marks)**

Module-4

7 a. With the help diagram, explain the operation of successive approximation type of digital voltmeter. **(10 Marks)**
b. Explain dual slope integrating type of DVM. **(10 Marks)**

OR

8 a. Describe with block diagram the operation of digital frequency meter. **(10 Marks)**
b. Explain the followings:
i) Wheat stone bridge
ii) Wein bridge. **(10 Marks)**

Module-5

9 a. With neat diagram, explain the operation of LVDT. **(10 Marks)**
b. Describe the followings:
i) Electrical transducer parameters
ii) Resistive position transducer. **(10 Marks)**

OR

10 a. With neat structure explain the operation of PLC. **(10 Marks)**
b. Explain operation of instrumentation amplifier using transducer bridge. **(10 Marks)**

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