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BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

DEEE - FIFTH SEMESTER EXAMINATION

POWER ELECTRONICS AND PLC

Time : 3 Hours]   [*Total Marks* : 80

PART—A   3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Draw the ISI circuit symbols for *(a)* TRIAC, *(b)* SBS and *(c)* LASCR.

2. State the necessity of commutation in SCR's.

3. Draw the circuit diagram for the operation of chopper in all four quadrants.

4. Draw the circuit diagram of series inverter.

5. Define cyclo-converter and list any two applications of cyclo-converter.

6. State any three applications of power electronic circuits.

7. Mention any three devices used to suppress spikes in supply system.

8. State the need for automation.

9. List the types of timers and counters used in PLC.

10. List any three hardware components used in SCADA.

PART—B
10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Describe the constructional details of SCR. 5

(b) Describe the two transistor analogy of SCR. 5

12. Explain the construction, working and V-I characteristics of IGBT with neat sketches. 10

13. Explain the working of single-phase half-wave controlled converter with resistive load with neat waveforms. 10

14. *(a)* Explain the working of single-phase AC regulator with neat waveforms. 5

(b) Explain the working of single-phase bridge inverter with a neat sketch. 5

15. Explain the speed control for DC shunt motor using chopper with neat waveforms. 10

16. Explain the working of water level controller using closed loop control system with a neat sketch. 10

17. Draw the block diagram of PLC and explain the purpose of each part of PLC. 10

18. *(a)* List any four merits and four demerits of open loop control system. 5

(b) Draw and explain the ladder diagram for DOL starter. 5

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