C20-EE–504

7648

BOARD DIPLOMA EXAMINATION, (C-20)

MAY/JUNE—2023

DEEE - FIFTH SEMESTER EXAMINATION

POWER ELECTRONICS, PLC AND SCADA

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. State any six ratings of SCR.

2. State any six applications of SCR.

3. State the need of freewheeling diode in converters.

4. Define AC voltage controller and list any four applications.

5. State any six applications of inverter.

6. State any six applications of cyclo converters.

7. State any six factors affecting the speed of AC motors.

8. Draw the block diagram of an on-line UPS.

9. Draw the ladder diagram for NAND gate and X-OR gate.

10. State any three softwares used in SCADA.

PART—B

8×5=40

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

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

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

11. *(a)* Explain the V-I characteristics of SCR under forward bias and reverse bias conditions.

(OR)

(b) Explain Class C commutation of thyristor with a neat sketch.

12. *(a)* Explain the working of three-phase half wave controlled converter under resistance load with a neat waveforms.

(OR)

(b) Explain the operation of four quadrant chopper in all its four quadrants.

13. *(a)* Explain the operation of a series inverter with a neat circuit diagram.

(OR)

(b) Explain the working of single-phase centre tapped cyclo converter with a neat sketch.

14. *(a)* Explain speed control of three-phase induction motor using AC voltage controllers.

(OR)

(b) Explain the working of battery charging using SCR with a neat circuit diagram.

15. *(a)* Draw the block diagram of PLC and explain the purpose of each part.

(OR)

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

PART—C

10×1=10

Instructions : (1) Answer the following question.

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

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

16. State the need of data acquisition and explain the working of SCADA with PLC.

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