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C09–EE–604

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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

DEEE—SIXTH SEMESTER EXAMINATION

POWER ELECTRONICS

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 the following thysistor devices :

(a) GTOSCR

(b) ASCR

(c) LASCR

2. List the applications of DIAC.

3. What is the necessity of commutation in power electronics?

4. List any three applications of chopper.

5. State the advantages of using freewheeling diode.

6. List the applications of cycloconverters.

7. State any three advantages of thyristor-controlled drives.

8. Write any three factors that affect the speed of induction motor.

9. List the types of disturbance in commercial power supply.

10. Draw a neat circuit diagram of emergency lamp circuit using SCR.

PART—B

10×5=50

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

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

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

11. *(a)* Explain the constructional features of SCR. 5

(b) Draw and explain the *V-I* characteristics of SCR. 5

12. *(a)* Explain the operation of LASCR with neat diagrams. 5

(b) Draw and explain SCR circuit triggered by UJT. 5

13. *(a)* Draw and explain the overvoltage protection circuit using thyristor. 5

(b) Draw and explain the burglar alarm circuit using SCR. 5

14. Explain the three-phase half-wave controlled converter with resistive load and draw its waveforms. 10

15. Explain the control modes of chopper by using *(a)* variable frequency control, and *(b)* constant frequency control. 5+5

16. Explain the basic series inverter and parallel inverter with neat diagrams. 5+5

17. Explain the speed control of induction motor using voltage-frequency control along with converter and inverter. 10

18. *(a)* Draw and explain the block diagram of SMPS. 5

(b) Draw and explain the block diagram of online UPS. 5

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