**1087**

**Code : 9EE-44**

*Register Number* | | | | | | | |

**IV Semester Diploma Examination, Nov./Dec., 2014**

# POWER ELECTRONICS

**Time : 3 Hours ]** **[ Max. Marks : 100**

***Note :*** (i) Section – **I** is *compulsory*.
(ii) Answer any **two** full questions each from remaining Sections – **II**, **III** and **IV**.

## SECTION – I

1. (a) Fill in the blanks with appropriate word/words : **5**
   (i) _____ is one of the most important devices used to trigger the triac.
   (ii) The semiconverter is a _____ converter.
   (iii) The chopper circuit using SCRs requires _____ to turn off the SCR.
   (iv) The accident firing of SCR can take if _____ rating is exceeded.
   (v) The switching boost regulator is a _____ converter.
   (b) Describe how power conditioners provide effective suppression to all electrical disturbances. **5**

## SECTION – II

2. (a) Explain the static V-I characteristic of SCR. **6**
   (b) List the modes of operation of triac and mention the preferred modes. **6**
   (c) List the applications of BJT. **3**

3. (a) Explain the operation of MOSFET and draw its transfer characteristic. **6**
   (b) Draw Resistance firing circuit and explain. **6**
   (c) List the applications of IGBT. **3**

4. (a) List the different methods of Turn-ON of an SCR. **4**
   (b) Draw the general layout diagram of firing circuit and explain. **5**
   (c) Compare IGBT, BJT and MOSFET. **6**

**[Turn over**

## SECTION – III

5. (a) Explain Line Commutation. 4

(b) With circuit diagram and wave forms explain the operation of single phase fully controlled bridge converter. 7

(c) Describe the process involved in selecting an SCR for a particular application. 4

6. (a) Define cyclo-converter and list the advantages of Cyclo-converter. 5

(b) With circuit diagram and wave form explain the operation of single phase full bridge inverter. 6

(c) Draw the basic power circuit of a step up chopper and explain its operation. 4

7. (a) Explain $\frac{dv}{dt}$ and $\frac{di}{dt}$ protection of SCR. 6

(b) Differentiate between voltage source inverter and current source inverter. 3

(c) Explain the three failure of an SCR. 6

## SECTION – IV

8. (a) Draw the schematic diagram of SMPS and explain its operation. 8

(b) Explain with circuit diagram step up DC to DC converter. 7

9. (a) Define the different types of power line disturbances. 5

(b) Explain speed control of shunt wound DC motor by armature voltage control method. 6

(c) List the application of linear power supply and SMPS. 4

10. (a) Draw the diagram of AC servo voltage stabilizer and explain its operation. 7

(b) Compare buck, boost and buck-boost DC to DC Converter. 4

(c) Draw circuit diagram of Solid State Relay and explain. 4