

Total No. of printed pages = 3

Et-503/PE/5th Sem/2014/N

POWER ELECTRONICS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *six* from the rest.

1. (a) State whether the following statements are true or false. 5×1=5
- (i) A power diode has exactly similar construction as a low power pn junction.
 - (ii) A MOSFET has lower switching time than BJT.
 - (iii) An IGBT has low losses as well as low switching time.
 - (iv) In high power devices, rectifier circuit use diodes.
 - (v) As the firing of thyristor is delayed, the output voltage of the converter increases.

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(b) Fill in the blanks with suitable words.

1×5=5

- (i) An SCR has layers of semiconductor material.
 - (ii) In a DIAC the dropping of two junctions is
 - (iii) A chopper is a converter.
 - (iv) UPS stand for
 - (v) The base region of BJT is very
2. Discuss the operation and working of a single phase half wave controlled rectifier with a RL load and free wheeling diode. Also draw the wave form of input voltage, firing pulses, output voltage, current and voltage drop across thyristor. 10
3. What is an inverter ? Discuss the classification of inverters. Explain the operation of a voltage driven inverter with a neat circuit diagram. 10
4. What is UPS ? Explain the working of on line and off line UPS. 10
5. What is a SMPS ? What can be possible configurations ? Discuss and explain them in very brief. 10

6. What is a Triac ? Explain its mode of operation with a neat circuit diagram. Also draw the characteristics curve of a triac. 10
7. Draw the circuit of speed control of DC motor and explain its working. 10
8. Write short notes on any *two* : $5 \times 2 = 10$
- (a) IGBT
 - (b) GTO
 - (c) DIAC
 - (d) Heat Sink
 - (e) Power MOSFET.