FACULTY OF ENGINEERING
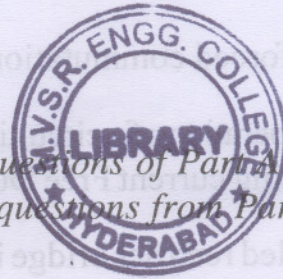## BE 3/4 (E & EE/Inst.) I Semester (Main) Examination, December 2010
POWER ELECTRONICS

Time : 3 Hours]

[Max. Marks : 75

Note : 1) Answer **all** questions of Part A.
2) Answer **five** questions from Part **B**.

PART – A

(2½×10=25 Marks)

1. What is the basic difference between a BJT and an SCR ?

2. Define the terms :
   i) Turn ON time
   ii) Turn OFF time
   iii) HOLDING current
   iv) LATCHING current of SCR.

3. Draw the UJT triggering circuit.

4. Explain the necessity of a snubber circuit.

5. What is the function of a Free Wheeling Diode ?

6. What is the difference between a Dual Converter and a Cyclo Converter ?

7. What is the basic function of an A.C. voltage regulator ?

8. Explain briefly about buck regulators.

9. Explain about single pulse width modulation adopted for Inverters.

10. Mention the practical applications of Inverters.

PART – B   (50 Marks)

11. a) Explain the V – I and transfer characteristic of N-channel MOSFET.

    b) Compare IGBT and MOSFET.   10

12. Discuss in detail any 4 types of forced commutation circuits.   10

13. Discuss in detail the principle of operation of circuiting current mode dual-converter.
    Compare circulating and circulating current Free Dual converters.   10

14. A single-phase full-wave controlled rectifier bridge is supplied from a 150 V source
    with a load resistance of 10 ohms. If the firing angle is 30° find

    i) the average load voltage

    ii) the average load current

    iii) Max. load current

    iv) RMS load current and

    v) Power supplied to the load.   10

15. a) Discuss in detail the principle of operation of class – A chopper.   5

    b) A step up chopper is supplied from a 110 V DC source. The voltage required
       by the load is 440 V. If the switch is turned on for 0.25 ms find the chopper
       frequency.   5

16. With suitable circuit diagrams and wave forms explain the principle of operation of
    a 3 phase Inverter for 120° mode.   10

17. Write short notes on **any two** :   (5×2=10 Marks)

    a) Two-transistor analogy of SCR

    b) Protection of SCRS.

    c) Multiple pulse width modulation of Inverters.