

Total No. of Questions :8]

SEAT No. :

P3587

[5560]-541

[Total No. of Pages :2

T. E. (Electronics Engg.)

POWER ELECTRONICS AND APPLICATIONS

(2015 Pattern) (Semester - I) (304201)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers the Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*

- Q1)** a) What are heat sinks? Explain any one method of cooling technique with its need in high power industries. [7]
- b) Draw and explain V-I characteristics of SCR. Define I_L , I_H , V_{BO} , V_{BR} . [7]
- c) Compare MOSFET and IGBT. [6]

OR

- Q2)** a) Define triggering circuits. What are the different types of triggering methods? Explain any one in details. [7]
- b) Draw and explain single phase full converter for RL Load. [7]
- c) Explain Microprocessor based control circuit for power electronics applications. [6]

- Q3)** a) Explain Voltage control of inverters using PWM. [8]
- b) Explain Design of control circuit for three phase inverters. [8]

OR

- Q4)** a) Draw and explain three phase inverter with the help of waveform for 180° conduction mode for R load. [8]
- b) Explain Single phase AC voltage controller with RL load. [8]

P.T.O.

Q5) a) A buck converter operating at 50kHz is fed from a 12V battery and supplies 5V to load. Determine i) The maximum on-period of MOSFET switch given that battery voltage varies from 13.5V in fully charged state to 10V at the end of discharge. ii) Battery drain current under nominal condition with 10A load. iii) The value of choke required to maintain continuous current operation for a ripple current of 500 mA and worst case battery voltage condition. **[10]**

b) Explain Class C chopper with its wave forms. **[8]**

OR

Q6) a) Write short note on Low Drop out (LDO) Regulators ICs-TPS 7A4901. **[10]**

b) Explain Buck-Boost converter in detail. **[8]**

Q7) a) A UPS is driving 600W load which has lagging power factor of 0.8. The efficiency of inverter is 80%. The battery voltage is 24V DC. Assume that there is a separate charger for battery. Determine the following i) KVA rating of inverter ii) Wattage of rectifier iii) A-H rating of the battery for a backup time of 30 minutes. **[8]**

b) Explain performance parameter of a battery. **[8]**

OR

Q8) a) Draw and explain battery charger. **[8]**

b) Explain Selection of power converters for different drive applications. **[8]**

