

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P3601

[5560]-556

TE(E & TC)

POWER ELECTRONICS

(2015 Pattern) (Semester - II) (304186)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.

- Q1)** a) Explain the nature of gate characteristics & analyze the gate circuit requirements. [7]
- b) Draw & explain working of single phase fully controlled rectifier for R load .Draw input output Voltage waveforms. State equation for average output voltage. [7]
- c) Explain 120° conduction mode of three phase inverter for balanced star R load with circuit diagram [6]

OR

- Q2)** a) Describe the concept of Safe operating areas of MOSFET & IGBT.[7]
- b) Draw & explain three phase semi converter for R load with input & output voltage waveforms. [7]
- c) Explain 180° conduction mode of three phase inverter for balanced star R load with circuit diagram [6]

- Q3)** a) Explain the operation of step down chopper with circuit diagram and derive an expression for its output voltage in terms of chopping frequency.[8]
- b) Classify SMPS ,draw a generalized block diagram of SMPS State its advantages and limitations. [8]

OR

- Q4)** a) In DC chopper ,average load current is 30 A, Chopping freq. is 500 Hz, $V_s = 110V$. Calculate on and off period of chopper ,if R_L is 2 Ohms. Illustrate your answer with suitable waveforms [8]
- b) Explain working of single phase full wave bidirectional controller using SCR with R load. Draw waveforms and State equation of RMS output voltage. [8]

P.T.O.

- Q5)** a) What is resonant converter? State necessity of the resonant converter?[8]
b) Explain design considerations of heat sink to reduce switching losses in the power circuits? Name four protection devices. [8]

OR

- Q6)** a) Compare zero current and zero voltage switching resonant converters?[8]
b) A power device has a thermal resistance of 200 deg C/watt. Calculate the maximum permissible power dissipation when maximum junction temperature is 75 deg C and ambient temperature is 37dgs C? [8]

- Q7)** a) With a circuit diagram, explain an application of Triac to control the domestic fan speed. [8]
b) Explain working of LED lamp Driver Circuit used as a domestic tube light. [10]

OR

- Q8)** a) What are Drives? Explain the working of Variable frequency three phase induction motor drive. [8]
b) Explain working of on Line UPS. State four important commercial specifications. [10]

