

Total No. of Questions :6]

SEAT No. :

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**P91**

**APR. -16/TE/InSem. - 23**  
**T.E.(E & TC Engineering)**  
**POWERELECTRONICS**  
**(2012 Pattern) (Semester - II)**

*Time : 1Hour]*

*[Max. Marks :30*

*Instructions to the candidates:*

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q6.*
- 2) *Neat diagrams and waveforms must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Use of nonprogrammable calculator is allowed.*
- 5) *Assume suitable data if necessary.*

- Q1)** a) Draw & explain two transistor analogy of SCR. [6]
- b) For an SCR, the gate cathode characteristics has a straight line slope of 130. For triggering source voltage of 15V and allowable gate power dissipation of 0.5W, calculate the gate series resistance ( $R_g$ ). [4]

OR

- Q2)** a) Draw construction diagram of n-channel enhancement type MOSFET and explain its steady state characteristics. [5]
- b) Compare power MOSFET with SCR. [5]
- Q3)** a) Draw & explain single phase fully controlled bridge converter for R-L load with various o/p voltage waveforms. [7]
- b) A single phase semi converter is operated from 120V, 50Hz AC supply. The load is resistive having resistance of  $15\Omega$ . If the average output voltage is 25% of the maximum possible average output voltage, determine the firing angle ( $\alpha$ ). [3]

OR

- Q4)** a) Draw & explain three phase half controlled bridge converter for R load with o/p voltage waveforms. [7]
- b) Explain the significance of free wheeling diode in controlled rectifiers. [3]

**P.T.O.**

- Q5)** a) Draw & explain single phase full bridge inverter for R-L load with o/p voltage & current waveforms. [6]
- b) Single phase full bridge inverter is operated from 48V dc supply, it has a resistive load of  $R = 2.4 \Omega$ . Find its. [4]
- i) Output power( $P_o$ )
- ii) Total harmonic distortion(THD)

OR

- Q6)** Explain  $120^\circ$  mode in three phase inverters for balanced star R load with circuit diagram in detail. [10]

