B.Tech. SEM -IV Electrical 2014 Course (CBCS) : WINTER - 2018

SUBJECT- POWER ELECTRONICS

Day: Tuesday **W-2018-2342** Time: 02.30 PM TO 05.30 PM

Date: 13/11/2018 Max. Marks: 60

N.B.:

1) Solve any **THREE** questions from each section.
2) Figures to the right indicate **FULL** marks.
3) Draw neat diagram **WHEREVER** necessary.

Q.1 **a)** Explain in detail the turn off mechanism of an SCR. **(05)**

b) Give in detail the comparison between transistors & thyristor (5 points minimum) **(05)**

OR

Q.1 **a)** What are *dv/dt* and *di/dt* ratings of SCR? What happens if these ratings are exceeded? **(05)**

b) What do you mean by commutation of SCR? What are the different classes of forced commutation method? **(05)**

Q.2 Explain the operation of 3phase half wave controlled converter with RL load draw & Explain with associated wave form. **(10)**

OR

Q.2 Explain the operation of 3phase fully controlled bridge converter with inductive load .Draw the voltage & current wave from for α=70 **(10)**

Q.3 **a)** Explain the difference between TRIAC & SCR. **(05)**

b) Explain the various triggering modes of TRIAC .Compare their sensitivity **(05)**

OR

Q.3 **a)** Explain the operation of multistage sequence control of AC voltage regulator with suitable power diagram. **(05)**

b) Explain why the 1phase AC regulator using 2SCR Must have its trigger sources isolated from each other. **(05)**

P.T.O.

Q.4 **a)** Discuss the static latch up & dynamic latch-ups in IGBT. **(05)**

b) State the Gate drive circuits for power MOSFET. **(05)**

OR

Q.4 **a)** Compare between online & offline UPS. **(05)**

b) Draw & Explain the IGBT Driver Circuit with over current protection. **(05)**

Q.5 A DC chopper circuit connected to a 100V dc source supplies an inductive load having 40mH in series with a resistance of 5ohm .A freewheeling dioed is placed across the load. The load current varies between the limits of 10A and 12A Determine the time ratio of the chopper. **(10)**

OR

Q.5 In a 110V DC Chopper drive using the CLC scheme the maximum possible accelerating current is 300A, the lower limit of the current pulsation is 140 A. The on state & off state are 15 ms and 12 ms respectively. Calculate the limit of current pulsation, chopping frequency, duty cycle & the output voltage. **(10)**

Q.6 **a)** The single phase half bridge inverter has a resistive load of 10Ω & the centre tap DC input voltage is 96 V compute RMS value of output voltage. **(05)**

b) Compare transistorised & Thyristorised Inverters **(05)**

OR

Q.6 **a)** A single phase full bridge inverter is operated from 48V battery & is supplying power to a pure resistive load of 10 Ω. Determine the output volatage **(05)**

b) Explain how is the output voltage & frequency of PWM inverter is varied? **(05)**

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