Total No. of Questions :10]

SEAT No. :

P3608

[Total No. of Pages : 2

[5560]-563
T.E. (Electrical)
POWER ELECTRONICS
(2015 Pattern) (Semester - I)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer any one questions from Q1 & Q2, Q3 & Q4, Q5 &Q6, Q7 &Q8, Q9 & Q10***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Black figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain with neat circuit diagram operation of R-C triggering circuit of Thyristor **[5]**

b) Write short note on Class E Chopper. **[5]**

OR

Q2) a) Describe working of single phase semi converter with RL load. Draw weveforms of load voltage, load current. **[5]**

b) Draw and explain output and transfer characteristics of MOSFET **[5]**

Q3) a) Describe working of single phase circulating type of dual converter with output voltage waveform. **[5]**

b) State and explain different modes of operation of SCR with the help of V-I characteristic. **[5]**

OR

Q4) a) Explain the following ratings of the thyristor.

i) Latching current

ii) Holding current **[5]**

b) For a type A chopper circuit, source voltage Vs = 220V, chopping period, T=2000 μs , on period =600 μs , load circuit parameters: $R = 1\Omega, L = 5mH$ and E=24V. Calculate the maximum and minimum values of steady state output current. **[5]**

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Q5) a) With neat diagram explain four mode operation of a TRIAC. **[8]**

b) Explain working of three phase fully controlled converter with RL load & firing angle of 30^0. Draw output voltage waveforms & obtain expression for phase voltage & Line voltage. **[8]**

OR

Q6) a) A three phase full converter operating from three phase, 415V, 50Hz supply with resistive load, Determine average output voltage for $\alpha = 30^o$ and $\alpha = 90^o$. **[8]**

b) What is two stage ac voltage regulator? Explain its operation with output waveform for RL Load. **[8]**

Q7) a) For single pulse width modulation with quasi square wave show that output voltage can be expressed as $V0=\sum_{n=1,3,5,.....}^{\infty} \frac{4Vs}{n\pi}\sin\frac{n\pi}{2}$ sinnd sinnwt. Where Vs is source voltage and pulse width is 2d. **[8]**

b) Explain with circuit diagram and waveforms operation of single phase current source inverter. **[8]**

OR

Q8) a) Explain Sinusoidal Pulse width modulation with necessary waveforms. **[8]**

b) A single phase full bridge inverter is operated from 48V battery and is supplying power to a pure resistive load of 10Ω .Determine **[8]**

i) Output voltage (rms voltage)

ii) Output rms power

Q9) a) List different harmonic elimination techniques used in inverter. Explain any two methods in detail. **[10]**

b) Draw a neat diagram and explain cascaded multi level converter. **[8]**

OR

Q10)a) Explain working of three phase six step voltage source inverter in 180^o mode of operation. For star connected load draw output voltage waveforms. Show devices conducting in each step. **[10]**

b) Write short note on Flying Capacitor multilevel converter. **[8]**

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