Total No. of Questions :12]

SEAT No. :

P2921

[Total No. of Pages :3

[4958] - 155

T.E. (Electronics)

POWER ELECTRONICS

(Semester - I) (2008 Course)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer 3 questions from section - I and 3 questions from Section - II.***
2) ***Answer to the two Sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic tables, electronic pocket calculator is allowed.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) For 3 ϕ fully controlled bridge converter with R-L load derive an equation for r.m.s output voltage. **[6]**

b) Explain the operation of 3 ϕ fully controlled bridge converter with R-L load. Describe in detail the following modes of operation with associated waveforms. **[12]**

i) Rectifier mode

ii) Inverter mode

OR

Q2) a) What is dual converter? Explain in detail the operation of dual converter with Circulating current. List the advantage and disadvantage of the same. **[12]**

b) Define **[6]**

i) Holding Current

ii) Latching Current

iii) Forward break over voltage

P.T.O.

Q3) a) What is DC to DC converter? Explain with circuit diagram & waveforms working of chopper? Why it is preferred over phase controlled converters. **[10]**

b) Ad.c chopper circuit connected to a 100 V d.c source supplies an inductive load having 40mH in series with a resistance of 5Ω . A freewheeling diode is places across the load. The load current varies between the limits of 10A and 12A. Determine **[6]**

i) average value of load current

ii) maximum value of load current.

iii) the time raio of the chopper.

OR

Q4) a) Explain working of SLR half bridge DC ot DC converter along with waveforms. **[8]**

b) What is SMPS? Explain in brief. **[8]**

Q5) a) What is resonant converter? Explain the need of resonant converter. Give its classification. **[8]**

b) Define cycloconverter. Explain basic principle of operation of cycloconverter with neat equivalent circuit diagram. State its advantages & disadvantages. **[8]**

OR

Q6) Write short notes on any three, **[16]**

a) 4 Quadrant chopper.

b) 2 - quadrant type C chopper.

c) Inverse Cosine Method

d) Matrix converter

SECTION - II

Q7) a) Classify Inverters. Explain with circuit diagram & waveforms, working 3ϕ voltage source inverter operating in 120° mode with R - load. **[10]**

b) Explain the sinusoidal pulse width modulation tech used in inverter. **[8]**

OR

Q8) a) What is the need of cooling in industries? Suggest the remedies for reducing heating & power Dissipation in the Semi - conductor devices.**[10]**

b) What do you mean by Snubberscircuit. Give design of snubber circuit.**[8]**

Q9) a) Explain HF induction heating. **[8]**

b) What is the difference between soldering & welding? Explain at least onetype of welding techniques. **[8]**

OR

Q10)a) What is HVDC? Explain advantage of HVDC over HVAC. **[10]**

b) What is CTPT? Explain. **[6]**

Q11)a) What is importance of power factor. Explain the EAC method for PF improvement. **[10]**

b) Explain sequence control of series converters. **[6]**

OR

Q12)a) What is necessity of power quality? Explain with different types of power line disturbances. **[8]**

b) What is energy audit? Explain the required procedure for energy audit.**[8]**