Total No. of Questions : 12]

SEAT No. :

P2328

[Total No. of Pages :3

[4758] - 63
T.E. (Electronics)
POWER ELECTRONICS
(2008 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Answer 3 questions from Section -I and 3 questions from Section -II.***
2) ***Answers 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) Explain the operation of 3ϕ fully controlled bridge converter with resistive load. Describe in detail the following modes of operation with associated waveforms. **[12]**

i) Discontinuous conduction mode

ii) Continuous conduction mode.

b) For 3ϕ fully controlled bridge converter with resistive load derive an equation for rms output voltage. **[6]**

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) What is triggering? Give types of triggering? Explain any one type of it. **[6]**

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) A step down chopper has resistive load of R = 15 Ω and input voltage Edc = 200V. When the chopper remains in ON, its voltage drop is 2.5V. The chopper frequency is 1kHz. If the duty cycle is 50%, determine **[6]**

i) average output voltage

ii) RMS output voltage

iii) chopper efficiency.

OR

Q4) a) What are Cycloconverter? Explain with diagram & waveforms, 3 pulse cycloconverter. State its advantages & disadvantages. **[10]**

b) What is SMPS? Explain in brief. **[6]**

Q5) a) What is resonant converter? Explain the need of resonant converter. **[4]**

b) Explain 3-pulse and 6-pulse cycloconverter. **[6]**

c) Write a short note on SLR half bridge DC to DC converter. **[6]**

OR

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

a) 4 Quadrant chopper

b) μP based firing circuit for triggering.

c) Inverse Cosine Method

d) Matrix converter.

SECTION - II

Q7) a) What are inverters? Explain with circuit diagram & waveforms, working 3ϕ voltage source inverter operating in 180^{o}mode with R-load. **[10]**

b) Draw the schematic of a 3ϕ CSI and describe its operation with current waveforms. **[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 is auto sequential current fed PWM inverter? Explain. **[8]**

Q9) a) What is electric ballast? Explain with diagram and characteristics. **[8]**

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

OR

Q10)a) What is HVDC? Explain with its application. **[10]**

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

Q11)a) What is power quality? Explain different types of power line disturbances, preventive & nullifying measurement techniques. **[10]**

b) What is the need of 12 pulse inverter in industry? Explain. **[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]**

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