

Total No. of Questions : 12]

SEAT No. :

P2138

[Total No. of Pages : 3

[4659] - 112

B.E. (Electronics)

B : ADVANCED POWER ELECTRONICS

(Semester - I) (2008 Pattern) (Elective - I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) *Answer Q.no. 1 or 2; Q.no. 3 or 4; Q.no. 5 or 6 from Section - I and Q.no.7 or 8; Q.no.9 or 10; Q.no.11 or 12 from Section - II.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams and waveforms must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and stream tables is allowed.*
- 6) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is the need of series converter? Explain with the help of neat circuit diagram and waveforms working of single phase series full converter for level load. **[10]**
- b) For the above converter, derive an expression for input power factor.**[8]**

OR

- Q2)** a) With the help of neat circuit diagram, explain double side PWM Converter. Comment on power factor. **[10]**
- b) With the help of neat circuit diagram and relevant waveforms, explain Twelve-Pulse converter and its industrial application. **[8]**

P.T.O.

Q3) a) With the help of block diagram, explain PLL control of DC drives and state its advantages. [8]

b) With the help of neat circuit diagram, explain Cycloconverter based 3-phase induction motor drive. [8]

OR

Q4) Write a short note on any two : [16]

a) Microcontroller based DC drives.

b) Indirect vector control of AC drives.

c) Adaptive control.

Q5) a) With the help of neat circuit diagram and relevant waveforms, explain the operation of cascaded multilevel inverters. What are the advantages and disadvantages of it? [12]

b) What are the types and features of multilevel inverters? [4]

OR

Q6) a) What are the advanced modulation techniques of inverters? Explain. [12]

b) With the help of neat circuit diagram, explain the operation of variable dc-link inverter. [4]

SECTION - II

Q7) a) What are the advantages of resonant converters over switch mode converters? [6]

b) With the help of neat circuit diagram, relevant waveforms and mode equivalent circuits, explain the operation of a ZCS resonant DC-DC converter. [10]

OR

- Q8)** a) What are low drop out Regulators? Explain. [8]
b) What is the need of hot swappable redundant power supplies in industries? Explain. [8]

- Q9)** a) What is the role of Power Electronics in renewable energy? Explain with neat circuit diagram variable wind energy conservation system. [10]
b) What are solar powered drives? Explain. [8]

OR

- Q10)** Write a short note on any three : [18]
a) Traction drives.
b) Battery Charger.
c) Photo voltaic energy conservation system.
d) Energy conservation in electrical drives.

- Q11)** a) What is the need of energy audit? Explain in brief. [8]
b) What is HVDC? Explain. [8]

OR

- Q12)** a) What is power quality? Why it is required? Explain different types of power line disturbances. [8]
b) Explain the term 'voltage sag' and 'voltage swell'. What are the different sources / causes of voltage sags and swells? [8]

