

Total No. of Questions : 12]

SEAT No. :

P1757

[4859]-116

[Total No. of Pages : 3

B.E. (Electronics)

b : ADVANCED POWER ELECTRONICS

(2008 Course) (Elective - I) (Semester - 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 packet 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 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) What is the need of converter in industry. Explain with neat circuit diagram and waveforms, working of 3 phase IGBT based PWM rectifier. Comment on Power Factor. **[10]**

b) Explain the need of Twelve-Pulse converter in industrial application. **[8]**

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

b) Explain with neat block diagram Microcontroller based DC drives. **[8]**

OR

P.T.O.

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

- a) Direct vector control of Induction Motor.
- b) Flux vector control of Induction Motor.
- c) Sensor less vector control of Induction Motor.
- d) Adaptive control of Induction Motor.

Q5) a) With the help of neat circuit diagram and associated waveforms, explain the operation of Diode-Clamped multilevel inverter and state its features, advantages and disadvantages. [12]

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

OR

Q6) a) With the help of neat circuit diagram and associated waveforms, explain the operation of Cascaded multilevel inverter and state its features, advantages and disadvantages. [12]

b) What are the techniques of advanced modulation? Explain staircase modulation. [4]

SECTION - II

Q7) a) What are Z-Source inverters/compare with VSI and CSI. [6]

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

OR

Q8) a) What are low drop out Regulators? Explain. [8]

b) What are Bi-Directional Power Supplies? Explain. [8]

Q9) a) What is role of Power Electronics in renewable energy? Explain with neat circuit diagram variable wind energy conservation system. [10]

b) What is Traction drives? Explain semiconductor converter controlled Traction drives and state its advantages. [8]

OR

Q10) Write a short note on any two:

[18]

- a) Solar battery powered 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) Define the term voltage sag. Explain different sources of sags and interrupts.

[8]

OR

Q12)a) Explain probable preventative solutions to control the factors contributing the power quality distortions.

[8]

- b) What is FACTS (Flexible AC transmission)? Explain.

[8]

