[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

May-24-0443

EE-501 (Power Electronics-II)

B.Tech. 5th (CBCS)

Time : 3 Hours Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions in all, selecting One question each from section A, B, C & D. Section E is compulsory.

SECTION - A

1. What is the three-phase voltage source inverter? With the help of topology, explain the operating principle of three-phase 180 degree conduction mode voltage source inverter with switching matrix and deduce the expression of output voltage in terms of input voltage. (10)

2. (a) Describe the working of a single-phase half-bridge inverter. What are its main drawbacks and how are these drawbacks overcome? (5)

   (b) Using neat diagram and waveforms, explain the working of a McMurray Bedford Inverter. (5)

SECTION - B

3. Explain the operation of single-phase capacitor-commutated current source inverters with resistive load. Also, draw the related voltage and current waveforms in order to explain the operation of this inverter circuit. (10)

4. Explain the working and operation of Series and Parallel configuration of Inverters. (10)

SECTION - C

5. Discuss the various thyristor protection schemes. Explain each of them with suitable diagram. (10)

6. (a) Discuss the utility applications of thyristor in distribution system. (5)

   (b) Discuss, how the power electronics aids the energy storage system capacity for effective implementation? (5)

SECTION - D

7. What is UPS? Give its industrial applications. Describe rotating-type, short-break static and no-load UPS configurations. (10)

8. (a) Describe the operation of Single-phase AC switch using TRIAC. Also derive the average and rms value of currents for TRIAC. (5)

   (b) Describe ac solid state relays with relevant circuit diagrams. (5)

SECTION - E (Compulsory)

9. Explain the following:-

   (i) Compare VSI and CSI.

   (ii) What do you mean by full bridge inverter? Draw the circuit diagram.

   (iii) What is Pulse-Width Modulation?

   (iv) Differentiate between Series and Parallel Inverter.

(iii) What is the difference among Biostatic Mechanics and Biodynamic Mechanics?

(iv) What are the applications of Human body Kinematics in engineering sphere? Explain.

OR

6. Answer all the Questions (2+2+6=10)

(i) What is Forecasting? What are objectives of Forecasting?

(ii) What are the factors which affect Forecasting?

(iii) List out all the models of Forecasting and explain them.

SECTION-D

7. Answer all the Questions (5+5=10)

(i) What are the different types of plant layouts used in manufacturing? Explain them with suitable diagrams.

(ii) What are the different Quantitative Techniques of Operation Research which are used in Plant Layout evaluation? Explain all of them.

OR

8. Answer all the Questions (4×2.5=10)

(i) What is Inventory Control and its objectives?

(ii) What are the functions of Production, Planning and Control?

(iii) What are Inventory Control Strategies? List out all of them.

(iv) What is Economic Order Quantity? How is it calculated?

SECTION-E (Compulsory)

9. Answer all the Questions (8×2.5=20)

(i) What are social responsibilities of engineers?

(ii) What is the importance of training of employees in an organization?

(iii) How Standard Time is calculated for the job? Explain steps with suitable Formula.

(iv) Why the knowledge of Job Incentives is important for employee's welfare?

(v) Mention a product name where Ergonomics is used. Explain the various areas of applications of Ergonomics in that product.

(vi) What is the difference among short and long range forecasting?

(vii) List out the factors which affect Plant Location.

(viii) What is the function of Loading, scheduling and dispatching?