Total No. of Questions : 12]

SEAT No :

P1629

[Total No. of Pages : 3

[5058]-76

T.E. (Electronics)

DRIVES AND CONTROLS

(2008 Course) (304207) (Semester - II)

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

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.*
2) *Answers to the TWO sections should be written in separate book.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Assume Suitable data if necessary.*
6) *Use of nonprogrammable Electronic pocket calculator is allowed.*

SECTION - I

Q1) a) What are DC motor performance parameters? Explain in brief. **[6]**

b) Compare chopper fed and Converter fed DC drives? Also explain how to select a power electronics converter for a DC motors drive. **[6]**

c) Explain with circuit diagrams the operation of single phase dual converter fed drive for a separately excited DC motor. **[6]**

OR

Q2) a) Draw and explain the working of three phase full converter feeding a separately excited d.c. motor. Explain with typical waveforms, the operation in continuous and discontinuous armature current modes. **[8]**

b) Explain any two power factor improvement techniques for single phase converters. **[10]**

Q3) a) What is PLL? Explain in brief with block diagram PLL based speed control of a DC motor. Explain the advantages of this control. **[8]**

b) What are the advantages of Microprocessor based drives? With the help of a neat block diagram, explain the operation of Microcontroller based single phase dual converter fed DC drive. **[8]**

OR

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Q4) a) What is the need of braking? Explain in detail dynamic and regenerative braking for DC machines. **[8]**

b) Explain the operation of a closed loop DC motor drive. Also explain closed loop control of DC drives with Transfer function. **[8]**

Q5) a) With the help of neat diagram explain use of CSI for speed control of three phase induction motor. **[8]**

b) Explain Direct and Indirect Vector control of three phase induction motors? **[8]**

OR

Q6) a) Enlist different methods for speed control of induction motor. Explain variable frequency control of 3 phase induction motor using Cycloconverter. **[8]**

b) State and explain various schemes for induction motor speed control by voltage source inverters. **[8]**

SECTION - II

Q7) a) Compare Salient pole motor and Permanent magnet motor. **[4]**

b) Draw and explain block diagram of a self controlled synchronous motor fed from a three phase inverter. **[8]**

c) Draw and explain briefly the torque speed characteristics of synchronous reluctance motor at constant voltage and frequency. **[6]**

OR

Q8) Write Short note on **[18]**

a) Salient pole motor Drive.

b) Cylindrical rotor motor Drive.

c) Synchronous Reluctance motor drive.

Q9) a) With the help of a neat circuit diagram and waveforms explain the operation of 3 phase brushless dc motor drive. Also explain related waveforms. **[8]**

b) Explain the operation of Switched Reluctance motor. Also list the advantages of SRM used as adjustable speed drive. **[8]**

OR

*Q10)*a) What is a stepper motor? Explain various operating modes of stepper motor. Mention various types of stepper motors. Explain any one in details. **[8]**

b) Compare variable reluctance motor with permanent magnet stepper motor. **[4]**

c) Explain the operation of any one stepper motor driver circuit. **[4]**

*Q11)*a) What is Neuro Fuzzy system? Explain Adaptive network based Fuzzy Interface System. **[8]**

b) Explain the operation of Fuzzy logic based Induction motor drive. **[8]**

OR

*Q12)*Write Short notes on (any two) **[16]**

a) Neural network based PWM controller.

b) Application of neural network in drives and control.

c) Traction drives.

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