Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 41250

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Electrical and Electronics Engineering

080280075 – ELECTRIC DRIVES AND CONTROL

(Common to B.E. (Part-Time), Seventh Semester, Electrical and Electronics Engineering)

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What are the components of load torque?
2. What is meant by load equalization?
3. What are the drawbacks of rectifier fed DC drives.
4. Write about the time ratio control of DC choppers.
5. What is the effect of ripples on the performance of the motor?
6. Give the principle of vector control of Induction motor drive.
7. What are the advantages of static rotor resistance control over conventional methods?
8. Differentiate between true synchronous mode and self synchronous mode of speed control of synchronous motor.
9. What are the major advantages and disadvantages of cycloconverter fed synchronous motor?
10. List the advantages of microprocessor control of electric drives over dedicated hardware control.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Draw and explain the general electric drive system. (8)

(ii) How loads are classified based on their speed to torque characteristics? Explain. (8)

Or

(b) (i) Explain the choice of selection of the motor for different loads. (8)

(ii) Discuss in detail the determination of power rating of motors. (8)

12. (a) Explain the operation of a single phase fully controlled converter fed separately excited DC motor with neat waveforms and derive the Speed torque characteristics. (16)

Or

(b) (i) Explain using a power circuit the working of a single phase full converter fed d.c series motor drive. (8)

(ii) Explain the four quadrant operation of a DC motor with the help of a chopper circuit. (8)

13. (a) (i) Explain the operation of v/f control technique of speed control method of Induction motor. (8)

(ii) Describe the principle of operation of Static Scherbius system. (8)

Or

(b) (i) Explain the Voltage Source Inverter (VSI) fed induction motors drive operated as PWM inverter. (8)

(ii) Draw and explain the slip power recovery scheme applicable for three phase slip ring induction motor. (8)

14. (a) (i) Explain in detail about the self controlled mode of the Synchronous motor. (8)

(ii) Discuss the operation of a synchronous motor fed from a cycloconverter. (8)

Or

(b) (i) Explain the control of a commutator less DC motor. (8)

(ii) Explain the method of AC voltage regulator based speed control of three phase Induction motor. (8)

15. (a) (i) Describe the factors that affect the choice of drives for a particular application. (8)

(ii) Discuss the choice of a specific drive for a paper mill. (8)

Or

(b) (i) Briefly explain the microprocessor based control of drives. (8)

(ii) Describe the drives motors, the requirements of a drive and speed control methods applicable for a steel rolling mills. (8)
