

B.E. Seventh Semester (Electrical & Electronics Engineering) (CGS)

10402 : Power Electronics - II : 7 EX 04

P. Pages : 2

Time : Three Hours



AU - 2914

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and chemical equations should be given wherever necessary.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. a) Explain the concept of electrical Drive and state its advantages. 7
b) Classify the electrical Drives. 6

OR

2. a) State & explain classes of duty? 7
b) Compare AC and DC drive in respect of advantages, limitation and application area. 6
3. a) State objective, advantages and limitation of electric braking. 7
b) A 200V, 10amp, 1800rpm shunt motor has the armature resistance 0.6Ω and field resistance 360Ω . It is used to drive a load whose torque is constant. Determine
i) Motor speed if supply voltage decreases to 180V
ii) Find the additional resistance to be added in series with armature at starting to limit the current at starting to 20 amp at 180V. 6

OR

4. a) Explain the braking system for induction motor in detail. 7
b) A 230V, 870rpm, 100Amp, separately excited dc motor has an armature resistance of 0.05Ω . It is coupled to load with torque of 200 Nm find the speed at which the motor can hold the load by regenerative braking. 6
5. a) How PLL speed control scheme operate where do we use it. 7
b) A 220V, 1500rpm, 50A sep. excited motor with armature resistance of 0.5Ω is fed a 3 ϕ fully controlled rectifier. Available ac source has a line vlg of 440V, 50Hz star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero°. 7
i) Calculate the turn ratio.
ii) Determining the firing angle when motor running at 1200 rpm and rated torque.

OR

6. a) Explain the working of single phase separately excited dc motor drive. 7
- b) A 230V, 1500rpm sep. excited dc motor has an armature resistance of 1Ω and rated armature current of 10A. it is fed from 230V single phase ac 50Hz supply through a fully controlled bridge converter compute (a) speed if torque is 5 N-m and firing angle is 30° . 7

SECTION – B

7. a) Explain variable frequency control Method in induction motor. 7
- b) A 440V, 4Pole, 50Hz 3Phase 10HP star connected induction motor has a no load slip of 1% and full load slip of 4%.
Find
i) Synchronous speed
ii) Speed at no load
iii) Speed at full load
iv) Frequency of rotor current at full load. 7

OR

8. a) Explain the microprocessor control based ac drive. 7
- b) A power input to rotor of 3 Phase 50 Hz 6 Pole induction motor is 100kw. The rotor emf makes 100 complete alternation per minute find
i) Slip
ii) Motor speed
iii) Mechanical power developed
iv) Rotor copper loss per phase
v) Rotor resistance per phase if rotor current is 65A. 7
9. a) Explain the principle of Vector control drive. 7
- b) Explain the vector control of current fed inverter drive. 6

OR

10. a) Explain the direct or feedback vector control. 6
- b) State the various speed estimation methods and explain EKF in details. 7
11. a) Discuss the control strategy of DTC. 7
- b) Explain the electric drive in sugar mills. 6

OR

12. a) Explain the important features of traction drive. 6
- b) Explain with block diagram the self tuning control. 7
