8E8042

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B.Tech. VIII Semester (Main/Back) Examination, April/May - 2017
Electrical and Electronics Engineering
8EX2A Electric Drives and Their Control
Common with 8EE2A

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Unit-I

1. a) What are the advantages and disadvantages of electric drives. **(4)**

   b) Explain the operation of a closed-loop speed control scheme with inner current control loop. What are various functions of inner current control loop? **(12)**

(OR)

1. a) Explain the four quadrant operations in motor. **(8)**

   b) Derive the mathematical expression for steady state stability of equilibrium point. **(8)**

Unit-II

2. a) Explain electric braking for D.C. separately excited motor, with suitable connection diagrams and speed - torque curves. **(12)**

   b) Explain the dynamic braking for D.C. series motor. **(4)**

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(OR)

2. a) Discuss operation of a dual converter in different modes, feeding a separately excited dc motor drive. **(8)**

   b) Explain working of current control loop and speed control loop for close loop control of separately excited D.C. motor drive. **(8)**

Unit-III

3. a) Explain the stator voltage control for speed control of induction motor. Why this method suitable for fan and pump drives. **(10)**

   b) What are the advantages and disadvantages of electrical braking? Explain plugging braking. **(6)**

(OR)

3. Explain the following braking in induction motor drives : **(2×8=16)**

   a) Dynamic braking

   b) Regenerative braking

Unit-IV

4. a) Explain using a power circuit how the speed of an induction motor drive can be controlled by using current source inverter. **(10)**

   b) Compare CSI fed induction motor drive with VSI fed drive. **(6)**

(OR)

4. a) Explain static rotor resistance control in closed loop speed control. **(8)**

   b) Draw and explain a closed-loop operation for a static Kramer controlled drive. **(8)**

Unit-V

5. a) Explain the power factor control of synchronous motor drive. **(6)**

   b) Explain the braking of synchronous motor with VSI. Draw the speed torque characteristic for regenerative braking. **(10)**

(OR)

5. a) Explain the control of synchronous motor using current source inverter. **(8)**

   b) Explain the control characteristics of an open loop V/*f* controlled synchronous motor. **(8)**

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