Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

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MEPS-302(B)

M.E./M.Tech., III Semester

Examination, November 2018

Advanced Electrical Drives

(Elective - II)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

iii) Assume suitable data if not given.

1. a) What is an electrical drive? What are the advantages of electrical drives? 7
   b) Explain essential parts of electrical drives? What are the functions of a power modulator? 7

2. a) What are the reasons for using load equalization in an electrical drive? 7
   b) A drive has following parameters.
   $J = 10$ Kg-m^2, $T = 100–0.1$ N, N-m, passive load torque $T_l = 0.05$ N, N-m where N is the speed in rpm. Initially the drive is operating in steady state. Now it is to be reversed. For this motor characteristics is changed to $T = -100–0.1$ N, N-m. Calculate the time of interval? 7

3. a) Explain what do you understand by the steady-state assumption stability? 8
   b) Explain in details different method of braking in DC motor drives? 6

4. a) A 2200V; 50 Hz 3-phase; 6-pole Y-connected squirrel cage induction motor has following parameters $R_S = 0.075\Omega$; $R_r' = 0.12\Omega$; $X_s = X_r' = 0.5\Omega$. The combined inertia of motor and load is 100 kg-m^2. Calculate time taken and energy dissipated in the motor during starting? 8
   b) What are the disadvantages of induction motors operation with unbalanced supply voltages? 6

5. a) List different speed control method of an induction motor. Explain in detail the speed control of Induction motor by stator voltage/Hertz control method? 7
   b) What are the advantages of squirrel cage induction moor over DC motors? 7

6. a) What is the basic differences between true synchronous mode and self control mode for variable frequency control of synchronous motor? Discuss? 8
   b) Why a self-controlled synchronous motor is free hunting oscillations? 6

7. a) Describe the operation of brushless DC motor drive with neat diagram and output quantities waveforms. 7
   b) Explain dynamic braking operation of 25 KV AC traction drive using thyristor controlled fed DC motors? 7

8. Write short notes on any two of the following: 14
   a) Solar powdered drives
   b) Energy conservation in electric drives
   c) Brushless DC motor
   d) Traction drives

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