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

Roll No .....

MEPS - 302(B)

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

Examination, June 2016

Advanced Electrical Drives (Elective-II)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. What is meant by 'Power Modulator'? Discuss the role of power modulator in electric drive system.

2. What are various components of load torques? Discuss the concept of load equalization.

3. With the help of neat and clean illustrations, explain the closed-loop control of a separately excited dc motor drive.

4. Discuss the advantages of CSI over VSI? Also discuss the V/Hz controlled closed-loop CSI-fed induction motor drive.

5. A 3-phase, 480V, 4-pole, 60Hz induction motor is driving a constant torque load of 60Nm. The parameters of the motor are
$R_1 = 0.4$ ohm, $R_2 = 0.1$ ohm, $X_{eq} = 4$ ohm, $R_1/R_2 = 2$.
Calculate the magnitude of the injected voltage that would reduce the motor speed to 1000 rpm. Also calculate the power received by the source of the injected voltage.

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6. An elevator consists of the cabin, motor, counterweight, cables and pulleys. The elevator cabin is full and is moving down ward. The mass of the cabin plus people is greater than the mass of the counterweight. Explain the operation of the motor in terms of energy transfer and indicate the speed-torque quadrant for this motion.

7. A dc shunt machine is used in high performance operation. The starting time of the motor must be limited to 2 sec. The motor has a moment of inertia equal to 1 Nm-sec^2. The field constant of the motor $K\varphi$ is 3 V-sec and the armature resistance is 2 ohm. Show how we can achieve the desired starting time?

8. Explain in detail the basic components and working of solar and battery powered drive system.

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