

Code :RR320206

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**III B.Tech II Semester(RR) Supplementary Examinations, April/May 2011**  
**UTILIZATION OF ELECTRICAL ENERGY**  
 (Electrical & Electronics Engineering)

Time: 3 hours

Max Marks: 80

**Answer any FIVE questions**  
**All questions carry equal marks**  
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1. (a) "Torque in a shunt motor varies with the armature current" Justify. Also plot torque characteristics of shunt motor.  
 (b) A squirrel cage induction motor takes twice full load current and develops half Full load torque when started by a star delta starter. If started by an auto Transformer with a 50% tapping, find the starting current and starting torque in terms of the full load values.
2. (a) "A flywheel is not used with a synchronous motor for load equalization" - Discuss.  
 (b) A 25 h.p. 3-phase 10 pole, 50 Hz induction motor fitted with flywheel has to supply a load torque of 750 Nw-m for 12 sec followed by a no load period during which the flywheel regains its original speed. Full load slip of the motor is 4% and the torque-speed curve is linear. Find the moment of inertia of the flywheel if the motor torque is not to exceed 2 times the full load torque.
3. (a) What are the factors to be considered for inductor design in induction heating?  
 (b) Give some applications of induction heating.
4. (a) Compare the features of individual and group drives.  
 (b) Explain how electric regenerative braking is obtained with a D.C. locomotive? How is the braking torque varied?
5. (a) Compare a tungsten filament lamp with fluorescent lamp in detail.  
 (b) Explain with sketches the constructional features of a filament lamp.
6. (a) What are the various types of lighting schemes? Explain with a neat sketch.  
 (b) Discuss the various factors that determine the design considerations for any lighting installation.
7. State the condition under which regenerative braking with d.c. series motor is possible and explain with the help of circuit diagram. Also explain the various methods of providing regeneration.
8. (a) Derive expression for the tractive effort for a train on a level track.  
 (b) The maximum speed of a suburban electric train is 60km/hr. Its scheduled speed is 40km/hr and duration of stops is 30sec. If the acceleration is 2km/hr/sec and distance between stops is 2kms, determine the retardation.

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