

R09

Code No: 09A70202

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, May/June - 2013

Utilization of Electrical Energy

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

- 1.a) A 220V d.c. series motor takes an armature current of 20A at 800 rpm. Calculate the speed if a diverter of 0.4Ω is connected in parallel with series field and the motor remains 20A. An armature resistance is 0.5Ω . series field resistance is 0.2Ω .
- b) Discuss the running characteristics of any two electric motors.
- c) Discuss the selection criterion of a motor for a drive application. [15]
- 2.a) What is meant by load equalization? Derive necessary equations.
- b) Discuss the i) plugging and ii) regenerative braking of electric motors. [7+8]
- 3.a) Classify various types of electric furnaces. List out their applications.
- b) Explain the construction and working of core type induction furnace.
- c) Discuss about the electrical problem in dielectric heating. [15]
- 4.a) List out different types of resistance welding. Explain them in detail.
- b) Discuss about various arc welding processes briefly. [7+8]
- 5.a) State and explain laws of illumination
- b) Find the height at which a light having uniform spherical distribution should be placed over a floor in order that the intensity of horizontal illumination at a given distance from its vertical line may be half of its maximum value. [7+8]
- 6.a) With the help of circuit diagrams, explain the working of the following light sources.
 - i) HPMV lamp
 - ii) Fluorescent tube
- b) Discuss the principles of street lighting. [7+8]
- 7.a) Derive the expression for the tractive effort of a propelling train.
- b) Derive the expression for specific energy consumption on a level track. Discuss about the factors affecting specific energy consumption. [7+8]
- 8.a) Discuss about various types of traction available in India.
- b) What is meant by schedule speed of a train?
- c) A schedule speed of 45 kmph is required between two stops 1.5 km apart. Find the maximum speed over the run if the stop is of 20 seconds duration. The values of acceleration and retardation are 2.4 kmphs and 3.2 kmphs respectively. Assume a simplified trapezoidal speed time curve. [15]

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