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8E8044	Roll No. _____	Total No. of Pages : 2
	8E8044	
	B.Tech. VIII Semester (Main) Examination - May 2016	
	Electrical and Electronics Engineering	
	8EX4.1 A Utilization of Electrical Power	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

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 suitably be assumed and stated clearly) Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Briefly describe the principle of induction heating at high frequency and highlight a few application of eddy current heating. (8)
- b) In the case of hardening a steel pulley, the depth of penetration required is 1.4 mm. The relative permeability is unity and the specific resistivity of steel is $5 \times 10^{-7} \Omega \text{ m}$. Determine the frequency of supply which is required to perform above operations. (8)

OR

1. Explain resistance welding, their types, advantages and disadvantages with suitable diagrams. (16)

Unit - II

2. a) Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp. (8)
- b) Discuss about the stroboscopic effect and its remedies with respect to illumination. Also explain sodium vapour lamp in detail. (8)

OR

2. a) Explain the principle of photometry. Also discuss about various photometer heads in detail. (8)
- b) Discuss the law of illumination and its limitations. (8)

Unit - III

3. a) State various types of power supplies used for electrolytic process. Discuss any one of them in detail. (8)
- b) Describe the process of extraction of metal or electro - extraction. Explain how zinc and aluminium are extracted from their ores. (8)

OR

3. a) State and explain faradays law of electrolytic process. What factors govern the rate of electrodeposition process. (8)
- b) Find the quantity of electricity and the steady current required to deposit 8gm of copper from the copper sulphate solution in 1 hour. The Electrochemical equivalent of copper is 0.3294 Mgm/c. (8)

Unit - IV

4. a) Discuss the suitability of DC series motor for its application in electric locomotive for traction duty. (8)
- b) Write short note on any two of followings: (2×4=8)
- i) Trolley collector
 - ii) Conductor rail system
 - iii) Third rail system of current collection.

OR

4. a) What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system. (8)
- b) Define any four terms of followings: (4×2=8)
- i) Crest speed.
 - ii) Average speed
 - iii) Schedule speed
 - iv) Adhesive weight
 - v) Coefficient of adhesion
 - vi) Tractive effort

Unit - V

5. a) Sketch the speed - time curve for urban, suburban and main line services. Give the approximate values of acceleration, braking and coasting period in each case. (8)
- b) Write short note on ward - leonard method for speed controls. (8)

OR

5. a) Discuss the advantages of series - parallel starting against the ordinary rheostatic starting for a pair of DC traction motors.
- b) Explain the advantages and disadvantages of the regenerative braking of electric traction motor? (8)