

**R15****Code No: 127JJ****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, May/June - 2019****UTILIZATION OF ELECTRICAL ENERGY****(Electrical and Electronics Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART- A****(25 Marks)**

- 1.a) Which motor is mainly used in electric drives? Why? [2]
- b) What are inductive loads? List some inductive loads. [3]
- c) Mention the advantages of electrical heating. [2]
- d) What is arc welding? [3]
- e) Define Luminous intensity. [2]
- f) Define Absorption factor and Reflection factor. [3]
- g) List different electric braking schemes. [2]
- h) What are special features of traction motors? [3]
- i) List some factors that affect specific energy consumption. [2]
- j) How does the retardation affect the specific energy consumption for a given scheduled speed? [3]

**PART-B****(50 Marks)**

- 2.a) What is an electric drive? List its advantages and applications.
  - b) What is meant by load equalization? How is it achieved? [5+5]
- OR**
- 3.a) Explain the speed control scheme normally used to control the speed of a DC motor below its rated speed.
  - b) Discuss various types of industrial loads. [5+5]
- 4.a) Explain the advantages and disadvantages of electric welding.
  - b) With a neat diagram, explain the process of Dielectric heating. [4+6]
- OR**
- 5.a) Compare between AC and DC welding.
  - b) Explain various types of arc welding processes used in industries. [4+6]
- 6.a) Describe the laws of illumination.
  - b) Write short notes on polar curves and photometry. [5+5]
- OR**
- 7.a) Compare between tungsten filament lamps and fluorescent tubes.
  - b) Four lamps 25m apart are arranged to illuminate a corridor. Each lamp is suspended at a height of 10m above the floor level. Each lamp gives 500 C.P. in all directions below the horizontal, find the illumination at second and third lamp. [4+6]

- 8.a) Explain about various types of track electrification.  
b) Draw and explain the typical speed-time curve for urban service. [5+5]
- OR**
- 9.a) Compare between DC and AC traction.  
b) Explain how rheostatic braking is done in DC shunt motors. [4+6]
- 10.a) Briefly explain the tractive effort required while the trains moving up the gradient and down the gradient.  
b) A locomotive accelerates a 300 tonne train up a gradient of 1 in 100 at 0.9 km/hr/sec. assuming the coefficient of adhesion to be 0.25, determine the minimum adhesive weight of the locomotive. Assume train resistance 40 newtons/tonne and allow 10% for the effect of rotational inertia. [5+5]
- OR**
- 11.a) What is coefficient of adhesion? How does it affect slipping of the driving wheels of the traction unit?  
b) The maximum speed of a suburban electric train is 60 km/hr. Its scheduled speed is 40 km/hr and duration of stops is 30 sec. If the acceleration is 2 km/hr/sec and distance between stops is 2 km, determine the retardation. [5+5]

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