

Code No: 117JJ

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, April/May - 2018

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) What are the advantages of electric drives? [2]
- b) What types of motors are used in electric traction? [3]
- c) What are the advantages of electrical heating? [2]
- d) List advantages of electric welding. [3]
- e) Define Space height Ratio. [2]
- f) Define Absorption factor and Reflection factor. [3]
- g) Why DC series motor was preferred for electric traction? [2]
- h) Draw the trapezoidal speed time curve of a train. [3]
- i) What factors affect specific energy consumption? [2]
- j) Define Coefficient of Adhesion. [3]

PART-B

(50 Marks)

- 2.a) What are the advantages of AC drives over DC drives.
- b) How are the electrical loads classified according to their duty? Explain with examples. [4+6]

OR

- 3.a) What is the need for speed control of electric drives? Explain the scheme used for the speed control of induction motor.
- b) What is meant by load equalization? Explain. [6+4]

4. Explain the various methods of electric resistance welding with neat sketches. [10]

OR

- 5.a) Differentiate between AC welding and DC welding.
- b) With a neat diagram, explain the working of metallic Arc welding. [4+6]
- 6.a) Explain with a neat diagram the principle of operation of a sodium vapour lamp and mention its use.
- b) A lamp with a reflector is mounted 12 m above the centre of a circular area of 24 meters diameter. If the combination of the lamp and reflector gives a uniform Candle Power of 1000 over the circular area, determine the maximum and minimum illumination produced on the area. [4+6]

OR

AG AG AG AG AG AG AG A

- 7.a) What is the difference between direct lighting and indirect lighting.
b) Two lamps are 16m apart and are fitted with a 100 candle power lamp each at a height of 6m above the ground. Calculate the illumination on the ground i) under each lamp ii) mid-way between the lamps. [4+6]

AG AG AG AG AG AG AG A

- 8.a) Explain how plugging and rheostatic braking are employed with dc motors.
b) What is Regenerative braking? Discuss their advantages. [5+5]

OR

9. Derive the equation of the crest speed for an approximate trapezoidal speed –time curve. [10]

AG AG AG AG AG AG AG A

10. 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. [10]

OR

11. Obtain the expression for tractive effort required in an electric train. [10]

AG AG AG AG AG AG AG A

---ooOoo---

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A

AG AG AG AG AG AG AG A