

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. IV Year I Semester Regular & Supplementary Examinations December-2024
UTILIZATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Draw and explain the operation of sodium vapour lamp with neat diagram and enumerate its advantages and disadvantages. CO1 L1 6M
 b A lamp having a uniform cp of 100 in all directions provided with a reflector which directs 60% of the light uniformly on to a circular area of 10m diameter. The lamp is hung 5m above the area. Calculate the illumination at the center. CO1 L2 6M

OR

- 2 a Explain with sketch the principle and operation of fluorescent lamp. CO1 L2 6M
 b Write short notes on flood lighting. CO1 L1 6M

UNIT-II

- 3 a Describe direct and indirect core type furnace with neat sketches. CO2 L2 6M
 b Explain application of induction heating. CO2 L2 6M

OR

- 4 Discuss the various applications of electrolysis in detail. CO2 L2 12M

UNIT-III

- 5 What is an electric drive? What are the different types of electric drives? Explain. CO3 L2 12M

OR

- 6 What are the different Types of Industrial Loads? Explain in detail. CO3 L3 12M

UNIT-IV

- 7 a Compare A.C traction with D.C traction with necessary examples. CO4 L3 6M
 b Explain about the different methods of electric braking systems in the case of traction. CO4 L2 6M

OR

- 8 a Discuss the speed-time curves for main line services. CO4 L1 6M
 b A train has schedule speed of 60 km/hr between the stops which are 6 km apart. Determine the crest speed over the run assuming trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3 km/hr/sec. Duration of stops is 60s. CO4 L3 6M

UNIT-V

- 9 An electric train of weight 250 ton has eight motors geared to driving wheels, each is 85 cm diameter. The tractive resistance is of 50/ton. The effect of rotational inertia is 8% of the train weight, the gear ratio is 4-1, and the gearing efficiency is 85% determine. The torque developed by each motor to accelerate the train to a speed of 50 kmph in 30 s up a gradient of 1 in 200. CO5 L3 12M

OR

- 10 a Write short notes on specific energy consumption. CO5 L2 6M
 b What factors affect the specific energy consumption? CO5 L2 6M

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