

Reg. No:

--	--	--	--	--	--	--	--	--	--

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

B.Tech IV Year I Semester Regular Examinations February-2022

UTILIZATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

- | | | | | |
|---|---|---|----|----|
| 1 | a | Define space to height ratio. | L2 | 2M |
| | b | Write the advantages of resistance welding. | L1 | 2M |
| | c | What are the major parts of an electric drive? | L3 | 2M |
| | d | Write any two advantages of electric traction system. | L2 | 2M |
| | e | Define specific energy consumption. | L1 | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- | | | | | |
|---|---|--|----|----|
| 2 | a | Explain principle and operation of fluorescent lamp with a neat sketch. | L1 | 5M |
| | b | A 250 CP lamp is hung 4m above the centre of a circular area of 6m diameter. Calculate the illumination at the (i) Centre of area, (ii) Periphery of the area, (iii) Average illumination. | L3 | 5M |

OR

- | | | | | |
|---|---|--|----|----|
| 3 | a | State and explain laws of illumination. | L1 | 5M |
| | b | If a lamp of 200CP is placed 1 m below a plane mirror, which reflects 90% of light falling on it, determine the illumination at point 3 m away from the foot of the lamp which is hung 4 m above the ground. | L3 | 5M |

UNIT-II

- | | | | | |
|---|---|---|----|----|
| 4 | a | Briefly discuss the method of Dielectric heating. | L2 | 6M |
| | b | Differentiate between DC and AC welding. | L2 | 4M |

OR

- | | | | | |
|---|---|--|----|----|
| 5 | a | What are the different types of heating? Write the advantages of electric heating. | L1 | 5M |
| | b | Discuss briefly about induction heating process. | L2 | 5M |

UNIT-III

- | | | | | |
|---|--|---|----|-----|
| 6 | | What is an individual drive, group drive and multi motor drive? Explain with suitable examples. | L3 | 10M |
|---|--|---|----|-----|

OR

- 7 a What are the advantages and disadvantages of Electric drives? **L3 5M**
b How do you select a motor for an industrial application? **L2 5M**

UNIT-IV

- 8 Describe how Plugging, Rheostatic braking and Regenerative braking are employed with DC series motor. **L2 10M**

OR

- 9 a Discuss the speed-time curves for urban service. **L2 5M**
b A train has schedule speed of 30 km/hr over a level track distance between stations being 1 km. Duration of stop is 20 sec. Assuming braking retardation of 3 km/hr/sec and maximum speed 25% greater than average speed, calculate acceleration required to run the service. **L3 5M**

UNIT-V

- 10 a A train is to run between two stations 1.6 km apart at an average speed of 40 kmph, the run is to be made to a quadrilateral speed- time curve. Maximum speed is to be limited to 64 kmph, acceleration to 2 kmphps, coasting retardation to 0.16, and braking retardation to 3.2, determine the duration of a acceleration, coasting and braking periods. **L3 6M**
b What factors affect the specific energy consumption? **L1 4M**

OR

- 11 A 100-ton weight train has a rotational inertia of 10%. This train has to be run between two stations that are 3 km apart and has an average speed of 50 km/hr. The acceleration and the retardation during braking are 2 kmphps and 3 kmphps, respectively. The percentage gradient between these two stations is 1% and the train is to move up the incline the track resistance is 50 N/ton, then determine:
(i) Maximum power at the driving axle.
(ii) Total energy consumption.
(iii) Specific energy consumption.

END