| O.P.Code: 20EE0243 | R20 | H.T.No. | | | | | | | | | |
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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

(AUTONOMOUS)

**B.Tech. IV Year I Semester Regular & Supplementary Examinations December-2024**

**APPLICATION OF ELECTRICAL POWER**

(Open Elective (OE) – IV)

**Time: 3 Hours** **Max. Marks: 60**

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

**UNIT-I**

| | | | | | |
|---|---|---|---|---|---|
| 1 | a | Write short notes on polar curves. | CO1 | L1 | 6M |
| | b | If a lamp of 200 cp is placed 1m below a plane mirror which reflects 90% of light falling on it, determine illumination at a point 3 m away from the foot of the lamp which is hung 4 m above ground. | CO1 | L3 | 6M |
| | | **OR** | | | |
| 2 | a | Draw and explain the operation of sodium vapor lamp with neat diagram. | CO1 | L1 | 6M |
| | b | Six lamps are used to illuminate a certain room. If the luminous efficiency of each lamp is 12 lumens/watt and the lamps have to emit a total lux of 10,000 lumens, calculate (i) The mean spherical luminous intensity (ii) The cost of energy consumed in 3 hours if the charge for electrical energy is 50 paise per unit. | CO1 | L3 | 6M |

**UNIT-II**

| | | | | | |
|---|---|---|---|---|---|
| 3 | a | Describe Indirect core type furnace with neat sketch. | CO2 | L3 | 6M |
| | b | Explain the principle of Induction heating. What are the applications of Induction heating. | CO2 | L2 | 6M |
| | | **OR** | | | |
| 4 | a | What are the disadvantages of direct core type induction furnace? | CO2 | L2 | 6M |
| | b | Explain the working of Ajax Wyatt vertical core furnace with a neat sketch. | CO2 | L1 | 6M |

**UNIT-III**

| | | | | | |
|---|---|---|---|---|---|
| 5 | a | Write briefly about flash welding. | CO3 | L1 | 6M |
| | b | Explain briefly the arc welding process. | CO3 | L1 | 6M |
| | | **OR** | | | |
| 6 | | Explain in detail about the following with respect to Welding: i) Spot welding ii) Seam welding iii) Butt welding iv) projection welding. | CO3 | L2 | 12M |

## UNIT-IV

| | | | | | |
|---|---|---|---|---|---|
| 7 | | Describe briefly the process of electrolysis and power supply for electrolysis. | CO4 | L1 | 12M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 8 | a | Calculate the thickness of copper deposited on a plate area of 2.2 $cm^2$ during electrolysis if a current of 1 A is passed. for 90 minutes. E.C.E. of copper = 32.95 x 10-8 kg/C and density of copper is 8900 Kg/m3 | CO4 | L2 | 12M |

## UNIT-V

| | | | | | |
|---|---|---|---|---|---|
| 9 | a | Compare A.C traction with D.C traction. | CO5 | L2 | 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. | CO6 | L3 | 6M |

**OR**

| | | | | | |
|---|---|---|---|---|---|
| 10 | a | Discuss the speed-time curves for main line services. | CO6 | L2 | 6M |
| | b | A sub urban electric train has a maximum speed of 70 km/hr. The schedule speed including a station stop of 30 sec in 45 km/hr. If the acceleration is 1.5 km/hr/sec. Find the value of retardation when the average distance between stops is 600 m. | CO6 | L3 | 6M |

*** END ***