Code No: 157FB

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, February/March - 2022
UTILIZATION OF ELECTRICAL ENERGY
(Common to CE, ME, ECE)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

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1. State the advantages of electrically produced heat by means of arc furnaces. Distinguish between the direct and indirect type of arc furnaces. State their field of application. [15]

2.a) What are the factors to be considered for inductor design in induction heating?
b) Explain the principle of dielectric heating. Also write the applications of Dielectric heating. [6+9]

3.a) Explain in detail about the working principle of resistance and arc welding.
b) With a neat diagram, explain the working of metallic Arc welding. [8+7]

4. Explain in detail about the following with respect to Welding:
a) Spot welding b) Seam welding c) Butt welding d) projection welding [15]

5.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. [9+6]

6.a) Define inverse square law and cosine cube law of illumination.
b) A lamp giving 300 C.P in all directions below horizontal is suspended 2m above the centre of a square table of 1m side. Calculate the maximum and minimum illumination on the surface of the table. [8+7]

7.a) An electric train has a maximum speed of 60 kmph. The scheduled speed including the station stop of 30 seconds is 40 kmph. If the acceleration is 1.5 kmphps, find the value of retardation when the average distance between the stops is 3 km.
b) Sketch the typical speed-time curves for mainline service and suburban service with electric traction. [6+9]

8.a) With the help of neat diagram, explain the method to obtain unidirectional polarity in train lighting.
b) Draw and explain the sequence of operation of Double Battery Parallel Block System in Train lighting. [7+8]

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