Seventh Semester B.E. Degree Examination, May / June 08
Electrical Power Utilization

Time: 3 hrs.

Note : *1. Answer any FIVE full questions.*
2. Any missing data can be assumed.

Max. Marks:100

1 a. Explain clearly resistance and arc heating. (04 Marks)
   b. With neat figure, explain Vertical core type Induction furnace. (06 Marks)
   c. A cubic water tank has surface area of $6.0m^2$ and is filled to 90% capacity six times daily. The water is heated from 20^0C to 65^0C. The losses per square metre of tank surface per 1^0C temperature difference is 6.3 watts. Find the loading in kW and the efficiency of the tank. Assume specific heat of water = 4,200 $J/kg/^0C$ and 1kWh = 3.6 MJ. (10 Marks)

2 a. What are the requirements of good welding? (05 Marks)
   b. Write the classification of electric welding. (05 Marks)
   c. What are the advantages of resistance welding? Explain clearly Butt welding along with its application. (10 Marks)

3 a. Explain clearly Faraday's laws of electrolysis. (05 Marks)
   b. Write and explain the factors governing the better electro – deposition. (05 Marks)
   c. A coating of nickel 1mm thick is to be built on a cylinder 20 cm in diameter and 30cm in length in 2 hours. Calculate the electrical energy used in the process if the voltage is 10 volts. E.C.E of Ni is 0.000304. Specific gravity of nickel is 8.9. (10 Marks)

4 a. Define the terms : i) Plane angle ii) Luminous efficiency iii) Luminous intensity iv) Reduction factor. v) Illumination. (05 Marks)
   b. State and explain laws of illumination and explain clearly illumination of a point. (07 Marks)
   c. A section of a road is to be illuminated by two lamps of 500 CP and 400 CP both being horizontally 20m apart and are suspended 6m above the surface level. Calculate illumination at A directly below the lamp of 500 CP and at B directly below the lamp of 400 CP. Also calculate illumination at C in the middle of points A and B. (08 Marks)

5 a. Explain clearly Trapezoidal speed - time curve by deriving relationship between principal quantities in speed - time curve. (12 Marks)
   b. A train runs with an average speed of 40 kmph. Distance between stations is 2km. Values of acceleration and retardation are 1.5 km. p.h.s and 2.5 kmph. p.s. respectively. Find the maximum speed of train assuming trapezoidal speed – time curve. (08 Marks)

6 a. Explain clearly regenerative braking as applied to d.c. shunt motor. (06 Marks)