

GUJARAT TECHNOLOGICAL UNIVERSITY**ME Semester –II Examination Dec. - 2011****Subject code: 1720711****Date: 19/12/2011****Subject Name: Electrical Power Utilization****Time: 02.30 pm – 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Make a neat sketch and explain of Ajax-wyatt core type induction Furnace. **07**
(b) What is resistance welding? Explain any one resistance welding with necessary diagrams. **07**

- Q.2** (a) Explain Dielectric Heating with its application and advantages. **07**
(b) A 15 kW, 220V, single phase resistance heating elements, if wire temperature is not to exceed 1000°C and the temperature of the charge is to be 600°C. Calculate the diameter and length of wire. Assume radiating efficiency to be 0.6, emissivity as 0.9. and resistivity $\rho = 1.016 \times 10^{-6} \Omega \cdot m$. **07**

OR

- (b) Comparison between Resistance welding and Arc welding. **07**

- Q.3** (a) Enlist the requirements of an ideal traction system. **07**
(b) A train runs at an average speed of 50kmph between stations situated 2.5 km apart. It accelerates at 2kmph/s and retards at 3kmph/s. Draw the speed-time curve for the run and find its maximum speed assuming a trapezoidal speed –time curve. **07**

OR

- Q.3** (a) Draw the typical speed-time curve and give explanation for its different parts. **07**
(b) An electric train is to have acceleration and braking retardation of 0.8 km/h/s and 3.2 km/h/s respectively. If the ratio of maximum to average speed is 1.3 and time for stops 26 seconds, find schedule speed for a run of 1.5 km. Assume simplified trapezoidal speed-time curve. **07**

- Q.4** (a) Discuss the working of Sodium Vapour Lamp with neat sketch. **07**
(b) The illumination of drawing office 30 m × 10 m is to have a value of 250 lux and is to be provided by number of 300 watt filament lamps. If the utilization factor is 0.4 and depreciation factor is 0.9, determine the number of lamps required. The efficiency of each lamp is 14 lumens per watt. **07**

OR

- Q.4** (a) State and explain laws of Illumination. **07**
Q.4 (b) It is desired to illustrate a drawing, that with an average illumination of 200 lux. The hall is 30×20 m². The lamps are to be fitted 4m from ground floor. Find the number of the lamps and wattage/lamp for the lighting scheme. Given efficiency of the lamps available as 25 lumens/watt, depreciation factor 0.8 and co-efficient of utilization 0.75, space height ratio between 0.8 to 1.2. Give satisfactory spacing arrangement. **07**

- Q.5** (a) What do you mean by air conditioning system? What are the main parts of air conditioning systems? Explain function of each part in brief. **07**
(b) Explain construction and working of washing machine. **07**

OR

- Q.5** (a) Explain construction and working of vacuum cleaner. **07**
(b) What are the different applications of electrolysis? **07**
