No. of Printed Pages : 3

BIEEE-011

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

00775 **December, 2014**

BIEEE-011 : ELECTRIC ENERGY UTILIZATION

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) What are the different systems of track electrification ? Discuss the various factors on which final choice of traction depends. *7*

(b) Define the term 'Welding'. Enumerate the various welding processes. *7*

2. (a) Sketch the typical speed – time curves for the train movement and from these derive a simplified speed – time curve. *6*

(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 stop is 26 seconds, find the schedule speed for a run of 1·5 km. Assume simplified trapezoidal speed – time curve. *8*

3. (a) Define the following terms : *8*

(i) Luminous flux

(ii) Lumen

(iii) Illumination

(iv) Lamp efficiency

(b) Explain briefly extraction and refining of metals by electrolysis. *6*

4. (a) What is electroplating and what for is it done ? Describe the various operations involved in electroplating. *7*

(b) Draw a complete diagram showing therein different components of an air-conditioning plant. What is the function of each component ? *7*

5. (a) Define refrigeration system. What are the main characteristic features of an air-refrigeration system ? *6*

(b) Calculate the efficiency of a high frequency induction furnace which takes 10 minutes to melt 1·8 kg of aluminium, the input to the furnace being 4·8 kW and initial temperature 15°C. Specific heat of aluminium = 0·88 kJ/kg°C; melting point of aluminium = 660°C; latent heat of fusion of aluminium = 32 kJ;
1 kJ = $2{\cdot}78 \times 10^{-4}$ kWh. *8*

6. (a) Describe with neat sketches, various types of electric light fittings used for illumination. 7

(b) Explain the principle of dielectric heating. Also write its applications. 7

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) Electric braking used in locomotives

(b) Hybrid electric vehicle

(c) Laws of illumination