

**B.Tech. - VIEP - ELECTRICAL ENGINEERING
(BTELVI)**

00683

**Term-End Examination
December, 2016**

BIEEE-011 : ELECTRIC ENERGY UTILIZATION

Time : 3 hours

Maximum Marks : 70

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

1. Discuss any *two* of the following : 2×7=14
 - (a) AC Series Motor for Electric Traction
 - (b) Heating of Buildings
 - (c) Faraday's Laws of Electro-Deposition

2. (a) Explain how MSCP is determined while using an integrating sphere. Draw a labelled diagram of an integrating sphere. 4+3=7

- (b) Draw the complete wiring diagram of a High Pressure Mercury Vapour (HPMV) discharge lamp. Explain the functioning of an HPMV lamp. 4+3=7

3. (a) Deduce the expression for total tractive effort for propelling a train on an elevated track from fundamentals. 7
- (b) Classify the various welding methods and explain any one of them. 7
4. (a) Discuss series-parallel starting of DC traction motors while illustrating with motor connection diagrams. 7
- (b) Define the following : $2 \times 3 \frac{1}{2} = 7$
- (i) Electrolysis
- (ii) Electroplating
5. (a) Derive expressions for length and diameter of a heating element using Stefan's law in case of a Resistance Heating Oven. $2 \times 3 \frac{1}{2} = 7$
- (b) Six resistances each of 50Ω are used in a resistance oven. How much power is drawn in the following cases ? $2 \times 3 \frac{1}{2} = 7$
- (i) For a supply of 400 V AC 1-phased resistances connected as 3 groups in parallel, each of 2 resistance units in series.
- (ii) For a supply of 400 V AC 3-phased resistances connected as Y with 2 resistance elements in parallel in each phase.

6. (a) Draw a labelled electrical circuit diagram of a refrigerator. Explain switching on/off of the compressor unit by a thermostat. 7
- (b) Discuss the working of an air-conditioning system with the help of a labelled diagram. 7
7. (a) Write down any seven important features of High Frequency Eddy Current Heating. 7
- (b) State the inverse-square law of illumination. 7
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