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BIEEE-011

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

Term-End Examination

00126

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

(a) High Frequency Power Supply Sources

(b) Flood Lighting

(c) Direct Arc Furnace

2. Discuss Regenerative Braking of DC motors with proper illustration. *14*

3. (a) Discuss the electrical problems in Dielectric Heating. Write down the expressions for potential gradients with illustration. *4+3=7*

(b) A piece of an insulating material is to be heated by dielectric heating. The size of the piece is 10 × 10 × 3 cm. A frequency of 20 Mega Hz is used and the power absorbed is 400 watts. Calculate the voltage and current required for heating. Take relative permittivity as 5 and p.f. as 0·05. *7*

4. (a) Discuss Faraday's First Law of Electrolysis. *7*

(b) Find the thickness of copper deposited on a plate area of 0·00025 m^2 during electrolysis, if a current of 1 Ampere is passed for 100 minutes. Take density of copper as 8900 kg/m^2 and electrochemical equivalent of copper as $32{\cdot}96 \times 10^{-8}$ kg/°C. *7*

5. (a) State and derive Lambert's law of illumination with illustration. *7*

(b) A lamp emitting 900 lumens is placed inside a globe of frosted glass having a diameter of 30·5 cm. The globe has a uniform brightness of 250 millilamberts in all directions. Calculate the candle power of the globe and estimate the percentage of light emitted by the lamp that is absorbed by the globe. *7*

6. (a) Explain the electrical circuit of a domestic refrigerator. 7

(b) Explain vapour compression cycle of a refrigeration system in detail. 7

7. (a) Explain the construction and working of Sodium Vapour Lamp. $2 \times 3\frac{1}{2} = 7$

(b) Discuss the two principles of street lighting. $2 \times 3\frac{1}{2} = 7$