

**DIPLOMA IN ELECTRICAL ENGINEERING
(DELVI)**

Term-End Examination

June, 2017

00964

**BIEEE-005 : UTILIZATION OF ELECTRICAL
ENGINEERING**

Time : 2 hours

Maximum Marks : 70

Note : *Question no. 1 is compulsory. Answer any four questions from questions no. 2 to 7: Use of scientific calculator is permitted.*

1. Choose the correct answer from the given alternatives :

$7 \times 2 = 14$

(a) Lux is a unit of

- (i) Luminous flux
- (ii) Luminous intensity
- (iii) Illumination
- (iv) Luminance

(b) The inside wall of a fluorescent tube is coated with

- (i) Sulphur powder
- (ii) Phosphor powder
- (iii) Sodium
- (iv) Krypton

(c) A good heating element should have

- (i) High resistivity and low melting point
- (ii) Low resistivity and high melting point
- (iii) High resistivity and high melting point
- (iv) Low resistivity and low melting point

(d) The temperature produced in indirect arc furnace is

- (i) More than direct arc furnace
- (ii) Less than direct arc furnace
- (iii) Equal to direct arc furnace
- (iv) None of these

(e) The practical luminous efficiency of a sodium vapour lamp is of the order of

- (i) 20 to 25 lumen per watt
- (ii) 25 to 40 lumen per watt
- (iii) 40 to 50 lumen per watt
- (iv) 60 to 67 lumen per watt

(f) The magnitude for the tractive effort which is required for the propulsion of the train depends on

- (i) The adhesive weight
- (ii) Friction between the driving wheel and the track
- (iii) Both (i) and (ii)
- (iv) Neither (i) nor (ii)

(g) The voltage – current characteristics of the arc welding must be

- (i) Exponentially rising
- (ii) Drooping
- (iii) Straight line
- (iv) Parabolic

2. (a) Define and explain the following terms with reference to lighting scheme :

4×2=8

- (i) Illumination
- (ii) Luminous intensity
- (iii) Solid angle
- (iv) Luminous flux

(b) Describe in brief the requirements of good lighting. Enumerate the factors to be considered while designing an indoor lighting scheme.

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3. (a) State seven advantages of electric heating over other types of heating. 7
- (b) Explain the working principle of arc furnaces. Describe with the help of a sketch, the construction and working of any one type of arc furnace. 7
4. (a) What are the main requirements of a traction motor with regard to electrical and mechanical features ? 7
- (b) Explain clearly 'free running', 'coasting' and 'braking' with reference to electric traction system. 7
5. (a) Draw the electric circuit of a refrigerator and explain its working. 7
- (b) Discuss the role of air-conditioning in our day-to-day life. 7
6. (a) What are the advantages and disadvantages of regenerative braking of electric traction motors ? 7
- (b) State and explain the laws of illumination. 7
7. (a) Why is tungsten selected as a filament material and on what factors does its life depend ? 7
- (b) Draw and explain a typical speed – time curve for electric train. 7