



C14-EE-501

4636

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**MARCH/APRIL—2018**  
**DEEE—FIFTH SEMESTER EXAMINATION**  
**ELECTRICAL UTILIZATION**

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

**Instructions** : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define the following terms regarding electric lighting :  $1\frac{1}{2}+1\frac{1}{2}=3$

(a) Utilization factor

(b) Depreciation factor

2. Define glare regarding electric lighting. 3

3. State the laws of illumination. 3

4. State any six requirements of good heating material. 3

5. List any six industrial applications of induction furnace. 3

6. List any six conditions for successful welding. 3

- \* 7. State the function of any three components in the electric circuit of a refrigerator. 3
8. Draw a neat electrical circuit diagram of car stereo wiring. 3
9. Compare between compact fluorescent (CF) lamps and tungsten filament lamps in any six aspects. 3
10. State the need of power saving devices. 3

**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Explain the production of light by ionization with a neat sketch. 5

- (b) A room 9 m × 12 m is illuminated by 12 lamps of 100 watt each. The luminous efficiency of the lamps is 30 lumen per watt and the coefficient of utilization as 0.45. Find the average illumination. 5

12. In a street-lighting scheme, two lamps with candle power of 500 are mounted 5 meters above the ground level. The distance between the posts is 10 metres. Determine the illumination (a) just below the lamp posts and (b) at the mid-point between the posts. 10

13. (a) Explain direct arc furnace with a neat sketch. 5

- (b) Explain the principle of operation of coreless induction heating with a neat sketch. 5

- \* 14. (a) A piece of plywood is to be heated by dielectric heating. The area of cross-section of the piece is  $0.5 \text{ m}^2$  and the thickness is  $2.5 \text{ cm}$ . If the frequency of  $25 \text{ megacycle per second}$  is used and the power absorbed is  $1000 \text{ watt}$ , find the voltage employed necessary for heating. The relative permittivity of wood is  $2.5$  and power factor is  $0.046$ . 6
- (b) State any eight industrial applications of dielectric heating. 4
15. (a) Explain the principle of spot welding with a neat sketch. 5
- (b) Explain the principle of operation of welding transformer with a neat sketch. 5
16. (a) Explain the principle of metal arc welding with a neat sketch. 5
- (b) Explain the characteristics of welding generator with a neat sketch. 5
17. Draw a neat electric circuit diagram of an air-conditioner and state the function of each component. 10
18. (a) Explain the working of magnetic induction lamp with a neat sketch. 7
- (b) Draw a neat automatic illumination control circuit using light dependant resistors (LDRs). 3

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