

**6442**  
**BOARD DIPLOMA EXAMINATION**  
**MARCH/APRIL - 2019**  
**DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING**  
**ELECTRICAL UTILISATION & TRACTION**  
**FOURTH SEMESTER EXAMINATION**

**Time: 3 Hours****Total Marks: 80**

**PART - A (3m x 10 = 30m)**

*Note 1: Answer all questions and each question carries 3 marks*

*2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences*

1. Define (a) Utilization Factor (b) Luminous Efficiency
2. State the requirements of good lighting.
3. List the industrial applications of coreless type induction furnace
4. List any three applications of dielectric heating
5. List any three advantages of using energy efficient systems for electric motors
6. List any three advantages of remote operated power utility devices
7. State the methods of improving coefficient of adhesion
8. State the importance of section insulator in electric traction
9. State the requirements of Train lighting
10. Define elementary section in traction system

**PART - B (10m x 5 = 50m)**

*Note 1: Answer any five questions and each carries 10 marks*

*2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer*

11. A hall is to be provided with a lighting installation. The hall is of size 30m X 20m x 8m. The mounting height is 5m and the required level of lamination is 110 lux. Using metal filament lamps, estimate the size and no. of signal lamp luminaries required and draw their spacing layout. Assume D.F = 0.8, U.F = 0.6 and space/height ratio = 1

Watt	200	300	500
Lumen/watt	10	12	12.3

12. A corridor is lighted by 4 lamps 10m apart and suspended at a height of 4m above the center line of the floor. If each lamp gives 100 C.P in all directions below the horizontal. Find illumination at a point on the floor mid-way between second and third lamps
13. A 20 kW, 1-phase, 220V oven employs circular nickel chrome wire for its heating elements. If the wire temperature is not to exceed 1170°C and the temperature of the charge is to be 500°C. Calculate the length and diameter of the wire required. Assume radiation efficiency as 0.6, emissivity as 1 and specific resistance of the nickel-chrome wire as  $1.016 \times 10^{-6} \Omega\text{-m}$
14. Explain the concept of Energy Auditing and Energy Management
15. What is tractive effort? Derive the expression for it. (3+7)M.
16. An electric train has quadrilateral speed-time curve as follows.
- (i) Uniform acceleration from rest to 2 kmph for 30 seconds
  - (ii) Coasting for 50 seconds
  - (iii) Breaking period of 20seconds
- (iii) Breaking period of 20seconds The train is moving a uniform up gradient of 1%; tractive resistance is 40 newtons per ton; rotational inertia effect 10% of dead weight; duration of station stop 15seconds and overall efficiency of transmission gear and motor is 75%. Calculate the value of its schedule speed and specific energy consumption of run if the distance travelled by the train is 1.03km
17. Draw the circuit of Double battery parallel block system in electric traction and explain about it.
- 18A. Write any five applications of dielectric heating
- B. Explain sectioning and paralleling post in traction system

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