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C16-EE-**403**

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BOARD DIPLOMA EXAMINATION, (C-16)

MARCH / APRIL — 2021

DEEE — FOURTH SEMESTER EXAMINATION

ELECTRICAL UTILISATION AND TRACTION

Time : Three Hours] [*Maximum Marks* : 80

PART-A 3×10=30

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

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

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

1. Define Luminous flux and Luminous intensity.

2. The candle power of a lamp placed normal to a working plane is 40 CP. Find the distance if the illumination is 15 lux.

3. Write the applications of direct and indirect Arc Furnaces.

4. State the applications of core type induction heating.

5. Draw magnetic induction lamp and label its parts.

6. State the advantages of CFL's.

7. Define specific energy consumption.

8. State the importance of speed-time curve.

9. Define the function of Pantograph.

10. State the function of Circuit Breaker.

PART-B

10×5=50

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

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

(*iii*) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (*a*) Explain the different types of lamp fittings. 5

(*b*) Two lamps of luminous intensity 200 candela and 250 candela are mounted at 15 m and 18 m respectively. The horizontal distance between the lamp posts is 40m. Calculate the illumination in the middle of the post. 5

12. (*a*) Define Utilisation factor and maintenance factor. 4

(*b*) A drawing hall 24 m × 12 m is to have direct lighting giving illumination of 120 lux on the working plane 80 cm above the floor. Coefficient of utilisation is 0.5 and maintenance factor is 0.8. Find the number of 40 W fluorescent tube lamps required and their rating if lamp efficiency is 60 lumens/watt. Assume suitable space height ratio and draw the layout. 6

13. Explain direct and indirect resistance heating with legible sketches. 5+5

14. (*a*) State the need of power saving devices. 4

(*b*) Explain the concept of energy auditing and management. 6

15. (*a*) Explain the function of booster transformer. 4

(*b*) The schedule speed of a train is 45 km/ph between two stations which are 3 kms. The maximum speed is 1.5 times the average speed and braking retardation 2 km/ph/ps. Calculate the acceleration required to run the service for trapezoidal speed time curve if station stopping time is 30 seconds. 6

16. (*a*) State the importance of section insulator. 4

(*b*) An electric train weights 300 tonne is to be accelerated up a gradient of 1 in 150 at an acceleration of 2 km/ph/ps. The effect of rotational inertia and in train resistance are 10% of dead weight and 50 Newton per tonne respectively. Find the traction effort. 6

17. (*a*) Explain the process of dielectric heating and mention its applications. 5

(*b*) Explain feeding and sectioning arrangements. 5

18. (*a*) Explain a single battery system. 6

(*b*) Mention the requirements of railway coach air conditioning. 4

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