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BOARD DIPLOMA EXAMINATION, (C–16)

SEPTEMBER/OCTOBER - 2020

DEEE—FOURTH SEMESTER EXAMINATION

ELECTRICAL UTILIZATION AND TRACTION

Time : 3 hours] [*Total Marks* : 80

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 *(a)* luminous intensity and *(b)* MSCP.

2. Define fluorescence.

3. Write the classification methods of electric heating methods.

4. What is induction heating?

5. Write the advantages of CF lamps.

6. Draw the circuit of illumination control using LDRs.

7. What are the requirements of a traction motor?

8. List out the factors affecting specific energy consumption.

9. What are the various constituents of supply systems in traction substation?

10. What are the requirements of Railway coach air conditioning?

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)* What are the different lighting schemes? Explain them briefly. 5

(b) Two street lamps of each 600 candela are mounted 8 m above road level and are spaced 10 m apart. Find the illumination on the ground *(i)* just below the lamp and *(ii)* in between the lamp posts. 5

12. *(a)* Explain the phenomenon of production of light by *(i)* excitation and *(ii)* ionization. 4

(b) A drawing hall 30 m × 15 m with a ceiling height of 5 metre is to be provided with a general illumination of 100 lux. Taking coefficient of utilization of 0·5 and depreciation factor as 0·8, determine the number of fluorescent tubes required, their spacing, mounting height and total wattage. Assume luminous efficiency of 40 lumen per watt for 80 watt tube. 6

13. Draw the basic circuit for electric arc furnace and explain. 10

14. *(a)* Explain coreless induction heating method with neat diagram. 5

(b) Write a note on the interruptors used in traction substations. 5

15. *(a)* Explain the benefits of LED lighting. 5

(b) What are the various advantages of using remote operation of appliances? 5

16. A 250 tonnes train with 10% rotational inertia effect is started with uniform acceleration and reaches a speed of 50 kmph in 25 secs. on level track. Assume simplified trapezoidal speed time curve and find the specific energy consumption if braking retardation is 3 kmphps, distance between stops 3 km, efficiency of motor 0·9 and track resistance is 5 kg per tonne. 10

17. Derive the expressions related to quadrilateral speed time curve. 10

18. *(a)* Explain feeding and sectioning arrangement. 5

(b) Draw the layout of a typical traction substation. 5

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