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BOARD DIPLOMA EXAMINATION, (C–16)

MARCH/APRIL—2018

DEEE—FOURTH SEMESTER EXAMINATION

ELECTRICAL UTILISATION 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)* plane angle and *(b)* luminous flux.

2. State the requirements of good lighting

3. State the advantages of electric heating.

4. What are the applications of di-electric heating?

5. State the need for power saving devices.

6. What are the advantages of remote operated power devices?

7. List the factors affecting the schedule speed.

8. Define specific energy consumption.

9. Mention the miscellaneous equipments used at control posts or switching stations.

10. What are the requirements of train lighting?

PART—B

10×5=50

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

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

11. *(a)* State and explain the laws of illumination. 5

(b) Two street lamps of 1000 candela and 800 candela are mounted 12·5 m above road level and are spaced 25 m apart. Find the illumination on the ground *(i)* just below the lamp and *(ii)* in between the lamp posts. 5

12. *(a)* Write a brief note on glare and explain how it can be minimised. 5

(b) A drawing hall 30 m × 15 m with a ceiling height of 5 metre is to be provided with a general illumination of 120 lux. Taking coefficient of utilisation of 0·5 and depreciation factor as 1·4, 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. 5

13. *(a)* Explain direct resistance heating with neat diagram. 5

(b) What are the applications of di-electric heating? 5

14. *(a)* The power required to heat an insulating slab of area 100 sq. cm and 2·2 cm thick is 250 watt at 20 MHz. The relative permittivity and power factor of the slab are 4·9 and 0·047 respectively. Calculate the voltage necessary and current through the material. 5

(b) Explain the method of obtaining uni-directional polarity. 5

15. Explain the concept of energy audit and management. 10

16. *(a)* The average speed of an electric train on level track is 35 kmph between two stations which are 1·5 km apart. Draw the speed time curve with all values, if it is accelerated at 2 kmphps and braked at 3 kmphps. 5

(b) What are the important parts of a speed time curve? Explain. 5

17. *(a)* Explain the control of traction motor by autotransformer with a neat sketch. 5

(b) Specify any five signal boards and mention the purpose of each. 5

18. *(a)* What are the important points to be considered while selecting the site for traction substation? 5

(b) Explain end-on generation. 5

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