



C09-EE-605 A

**3766**

**BOARD DIPLOMA EXAMINATION, (C-09)  
MARCH/APRIL—2018  
DEEE—SIXTH SEMESTER EXAMINATION**

ELECTRICAL UTILISATION AND AUTOMATION

*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 plane angle and solid angle.
2. Define glare and mention the reasons for glare.
3. State any six applications of dielectric heating.
4. State the advantages of coreless induction furnace.
5. State any six advantages of electric drive.
6. State any three advantages of electric braking.
7. State the factors affecting schedule speed.

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8. Classify the <sup>\*</sup> systems of track electrification.
9. List the input and output devices used with PLC.
10. List any six applications of PLC.

**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) Briefly explain different types of lamp fittings. 5  
 (b) A lamp giving 400 CP in all directions below the horizontal is suspended 3 m above the centre of a square table of 1.5 m side. Calculate the maximum and minimum illumination on the table. 5
12. (a) Explain direct arc heating with a neat sketch. 5  
 (b) Explain coreless-type induction heating with a neat sketch. 5
13. (a) Explain how noise can be reduced in drive. 5  
 (b) Write the classification of loads. 5
- \* 14. (a) Explain regenerative braking of a d.c. shunt motor. 5  
 (b) Explain timer-on ( $T_{ON}$ ) delay and timer-off ( $T_{OFF}$ ) delay instructions. 5
15. (a) Define coefficient of adhesion and list the factors affecting it. 4  
 (b) An electric train has an average speed of 42 kmph on a level track between stops 1.4 km apart. It is accelerated at 1.7 kmphs and braked at 3.3 kmphs. Draw the speed-time curve for the run. 6

16. Derive an <sup>\*</sup>expression for the tractive effort of an electric train. 10
17. An electric train has an average speed of 45 kmph on a level track between stops 3 km apart. It is accelerated at 1.5 kmphs and braked at 2.5 kmphs. Draw the speed-time curve for the run and find the specific energy consumption. Take tractive resistance 50 N/tonne and allow 12% for the rotational inertia. Assume efficiency of the motor as 90%. 10
18. (a) Explain different memories used in PLC. 5  
(b) Draw the ladder diagrams for AND, OR and NOT gates. 5

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