



C09-EE-605 A

3766

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2016

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 utilisation factor and space-height ratio.
2. Define glare and mention the reasons for glare.
3. State the requirements of good heating material.
4. State the advantages of coreless induction furnace.
5. Explain the use of flywheel in drives.
6. State the advantages of electric breaking.
7. Distinguish between urban and suburban services.
8. Classify the systems of track electrification.

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9. List the input and output devices used with PLC.
10. State the advantages 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 maximum and minimum illumination on the table. 5
12. Explain different methods of temperature control of resistance heating with neat sketches. 10
13. (a) State any five factors governing the selection of electric drive. 5
 (b) A motor has duty cycles—
 100 HP for 10 minutes
 80 HP for 5 minutes
 60 HP for 8 minutes
 No load for 4 minutes
 which repeats indefinitely. Determine the suitable rating of motor. 5
14. (a) Explain regenerative breaking of a DC shunt motor. 5
 (b) Explain Timer-on delay and Timer-off delay instructions. 5

- 15.** An electric train has an average speed of 45 kmph on a level track between stops 1.5 km apart. It is accelerated at 1.8 kmphs and braked at 3.4 kmphs. Determine (a) maximum speed and (b) schedule speed and also draw the speed-time curve. Assume duration of stop as 20 sec. 10
- 16.** Derive an expression for the tractive effort of an electric train. 10
- 17.** (a) Explain the need of Booster transformer in electric traction. 5
 (b) Explain the purpose and material used for pantograph collector. 5
- 18.** (a) Explain about ladder diagram in PLC. 5
 (b) Explain the following COUNTER instructions : 5
 (i) Count up (CTU)
 (ii) Count down (CTD)
