



C09-EE-605A

3766

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2015

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. State the requirements of good lighting. 3
2. Define (a) depreciation factor and (b) reduction factor. $1\frac{1}{2}\times 2=3$
3. State any six advantages of electric heating. $\frac{1}{2}\times 6=3$
4. List the methods of temperature control in resistance heating. 3
5. State the disadvantages of group drive over individual drive. 3
6. State a suitable motor for the following drives : 3
 - (a) Lathes
 - (b) Flour mills
 - (c) Rolling mills
7. Compare different types of train services in any three aspects. 3
8. What are the materials used for (a) catenary, (b) droppers and (c) bow collector? 3
9. What are the advantages of using PLCs? 3
10. Draw the ladder diagram for NOR gate. 3

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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) State and explain the laws of illumination. 5
(b) A lamp is taking a current of 0.6 A at 230 V and 125 MHCP. Find its efficiency in MHCP per watt and lumen per watt, if the spherical reduction factor is 0.77. 5
- 12.** Explain (a) core type and (b) core-less type induction heating. 5+5=10
- 13.** (a) Draw and briefly explain load curves of different types of loads. 5
(b) State the methods employed for reduction in noise. 5
- 14.** A 500 tonne goods train is to be hauled by a locomotive up a gradient of 2% with an acceleration of 1.2 kmphs. Coefficient of adhesion is 25%, track resistance is 40 N per tonne and effect of rotational masses is 10% of dead weight. Find the weight of the locomotive and number of axles, if axle load is not to exceed 21 tonnes. 10
- 15.** Draw quadrilateral speed-time curve and derive expression for distance travelled and V_1 and V_2 . 10
- 16.** A train weighing 120 T is to be driven up an incline of 2% at a speed of 36 kmph. If the train resistance at this speed is 2 kg/T, find the current required at 1500 V DC supply, if efficiency of motors and gearing unit is 88%. If current were cutoff, how long the train would take to come to rest? 10
- 17.** (a) Explain the working of counters CTU and CTD with the help of ladder diagrams. 5
(b) How are PLC memories organized? 5
- 18.** (a) Draw the ladder diagram of DOL starter and explain. 5
(b) Explain the regenerative braking of 3-phase induction motor. 5

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