



C09-EE-605 C

3768

BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2014
DEEE—SIXTH SEMESTER EXAMINATION
ELECTRIC TRACTION AND RENEWABLE
ENERGY SOURCES

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 advantages of electric traction.
2. Sketch speed-time curves of various services.
3. State various requirements of traction motor.
4. State the need of booster transformer.
5. State the need of renewable energy sources.
6. List the methods of solar energy storage.
7. List the applications of PV system.

- * 8. State different considerations for site selection for installing windmill.
9. List the advantages of tidal energy.
10. State the advantages of combined working of power plants.

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) Define maximum speed, average speed, schedule speed and coefficient of adhesion. 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 kmphps and is braked at 3.3 kmphps. Draw the speed-time curve with values. 6
12. (a) Derive an expression for the tractive effort. 5
- (b) An electric train weight 250 tonne is to be accelerated up a gradient of 1 in 80 at an acceleration of 1.2 kmphps. The effect of rotational inertia and train resistance are 10% of deadweight and 40 N/tonne respectively. Find the tractive effort. 5
- * 13. (a) Define specific energy consumption. List the factors affecting it. 5
- (b) List different current collectors used in electric traction and explain any one of them. 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/tonne and effect of rotational inertia is 10% of deadweight. Find the weight of locomotive and the number of axles, if axle load is not to exceed 24 tonne. 10
15. (a) Explain the flat-plate solar collector with sketch. 5
 (b) Explain the solar water pumping with sketch. 5
16. Explain the construction and working of windmill with neat sketch. 10
17. (a) Differentiate between Biomass and Biogas. 5
 (b) List the types of tidal power plants and explain any one of them. 5
18. Explain the working of combined-cycle power plant with block diagram and mention its applications. 10
