C09–EE–**605C**

3768

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

DEEE—SIXTH SEMESTER EXAMINATION

ELECTRICAL 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. What are the types of services in electric traction?

2. Briefly explain the factors which affects schedule speed.

3. What are the methods of improving coefficient of adhesion?

4. Briefly explain the pantograph collector.

5. List the different types of non-conventional sources of energy.

6. State the function of flat-plate collector.

7. What are the applications of solar pond?

8. Classify windmills.

9. What are the types of tidal power plants?

10. What do you understand by combined working power plants?

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)* Derive an equation for total distance travelled and V_m for trapezoidal speed-time curve.   5

(b) Deduce an expression for tractive effort in terms of wheel diameter, motor torque, gear ratio and efficiency of transmission.   5

12. Find the specific energy consumption of a 250 tonne electric train with 10% rotational inertia. The train reaches a maximum speed of 50 kmph in 25 second on level track. The distance between the stations is 2·4 km. The acceleration and retardation are 2 kmphps and 3 kmphps respectively. Assume the track resistance as 49 N/tonne and the efficiency of motors is 90%.   10

13. *(a)* Draw the connection diagram of a booster transformer in traction system and briefly explain the working.   5

(b) An electric train has an average speed of 40 kmph. The acceleration and retardation are 1·5 kmphps and 2·5 kmphps respectively between two stops of 2 km apart. Find the maximum speed.   5

14. *(a)* Explain single-catenary and double-catenary systems in electric traction.   5

(b) What are the requirements of traction motor?   5

15. *(a)* Explain the working principle of parabolic trough solar collector.   5

(b) Explain the working principle of solar air-heater and also mention the applications.   5

16. Explain the construction and working of a windmill with a neat sketch.   10

17. *(a)* Explain the construction and working of fixed dome biogas plant considering Janata model.   5

(b) Explain the working principle of tidal power generation.   5

18. *(a)* Write the applications of combined cycle power plant.   2

(b) Explain the working of combined cycle power plant using block diagram.   8

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