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BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2018

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. List the advantages and disadvantages of electrical traction.

2. State the factors which affect the schedule speed.

3. Define coefficient of adhesion.

4. List the conventional energy sources.

5. Explain the V-I characteristics of PV cell.

6. Define isovents and isodynes.

7. Differentiate between biomass and biogas.

8. State the requirements of tidal plants.

9. List different types of solar collector.

10. Write the advantages of combined cycle power plants.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. Define and derive the expression for tractive effort for electrical traction.

12. The average speed of an electric train is 45 kmph and the distance between the stations is 2.1 km. the acceleration, coasting and braking are 2.5 kmphps, 0.15 kmphps and 3 kmphps respectively. Find the distance covered during each period. (Assume quadrilateral speed time curve)

13. *(a)* With a neat diagram, explain how a traction motor will be controlled by an auto transformer.

(b) Draw and explain briefly the connection diagram of a booster transformer

14. An electrical train weighing 200 tonne has a rotational inertia of 12%. The train runs between two stations which are 3 km apart and has an average speed of 45 kmph. The acceleration and braking retardations are 1.5 kmphps and 2.5 kmphps respectively. The up gradient is 2%, the track resistance and overall efficiency are 50 N/tonne and 85% respectively. Find—

(a) maximum power on driving axle

(b) energy consumption

(c) specific energy consumption

15. *(a)* Explain clearly the construction of flat-plate solar collector.

(b) Explain vertical axis windmill.

16. *(a)* Explain the necessity of developing nonconventional energy.

(b) List various thermal devices.

17. *(a)* Briefly explain the working of PV cell.

(b) Explain the single basin tidal power plant.

18. *(a)* Explain the construction and working of fixed dome-type bio gas plant.

(b) Draw and explain briefly the block diagram of a combined-cycle power plant.

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