



C09-EE-605 C

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**BOARD DIPLOMA EXAMINATION, (C-09)
APRIL/MAY—2015
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. Define maximum speed, average speed and scheduled speed.
2. An electric train is to have a braking retardation of 3·2 kmphs with ratio of maximum speed to average speed being 1·3. The time for stop is 26 sec and acceleration is 0·8 kmphs. Find the scheduled speed for a run of 1·5 km.
3. Draw the connection diagram of booster transformer.
4. What are the factors affecting the specific energy consumption?

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5. What are the nonconventional sources of energy?
6. List the types of solar collector and state the function of it.
7. What are the advantages of PV cell?
8. List the components of a wind mill.
9. State the principle of biogas generation.
10. What are the advantages of combined-cycle power plant?

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. Derive an expression for speed at the end of coasting for a quadrilateral speed-time curve.
12. An electric train has a scheduled speed of 25 kmph between stations 800 m apart. The duration of station is 20 sec. The maximum speed is 20% higher than the average speed and braking retardation is 3 kmphs. Calculate the (a) rate of acceleration, (b) distance travelled before applying brakes, (c) accelerating time, (d) free running time, and (e) braking time.
13. A 200 tonne motor coach having four motors each developing 6000 NM torque during acceleration starting from rest. If the up gradient is 30 in 1000, gear ratio 4, gear transmission efficiency 90%, wheel radius 45 cm, train resistance 40 N/T and additional rotational inertia 10%, calculate the time taken to attain a speed of 50 kmph.

14. Derive an ^{*} expression for specific energy consumption for a trapezoidal speed-time curve.
15. (a) Explain the working principle of solar pond with a sketch. 5
(b) Explain solar water heating with neat sketch. 5
16. Explain, with neat sketch, horizontal-axis turbine wind mill.
17. (a) Classify tidal power plants. 4
(b) Briefly explain double-basin power plant. 6
18. Explain, with the help of block diagram, the working of combined-cycle power plant.

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