



C09-EE-605 C

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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2018

DEEE—SIXTH SEMESTER EXAMINATION

ELECTRICAL TRACTION AND RENEWABLE  
ENERGY SOURCES

Time : 3 hours ]

[ Total Marks : 80

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**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. Briefly explain single-phase to d.c. system of track electrification.
2. Define (a) maximum speed, (b) average speed and (c) schedule speed.
3. Define coefficient of adhesion.
4. What are the factors affecting specific energy consumption?
5. List the different sources of energy.
6. State the working principle of solar cell.

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7. What are the different types of concentrating collectors?
8. List the basic components of a windmill.
9. What are the advantages of tidal power generation?
10. What are the applications 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. (a) Derive an equation for  $V_m$  for trapezoidal speed time curve. 5  
 (b) Derive an expression for tractive effort. 5
12. Define specific energy consumption and derive an expression for specific energy consumption using simplified trapezoidal speed time curve. 10
13. A goods train of 400 tonne is to be hauled by a locomotive an up gradient of 2% with an acceleration of 1 kmphps. Track resistance is 40 N/tonne and effect of rotating mass is 10% of dead weight. Determine the weight of the locomotive and number of axles if the axle load is not to exceed 22 tonne. Take the coefficient of adhesion is 20%. 10
14. (a) List the various requirements of traction motor. 5  
 (b) Write a short note on pantograph collector. 5
15. Explain solar water pumping system with a neat diagram. 10

- 16.** (a) What are the site selection considerations for a windmill? 5  
(b) Explain the construction details and working principle of windmill with a neat diagram. 5
- 17.** Explain the floating dome biogas plant considering Khadi Village Industries Commission (KVIC). 10
- 18.** (a) What are the advantages of combined cycle power plant? 2  
(b) Explain the working of combined cycle power plant with a neat block diagram. 8

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