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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

DEEE—SIXTH SEMESTER EXAMINATION

ELECTRIC TRACTION

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 electric traction, in any three aspects.

2. Distinguish between mainline, urban and sub-urban services.

3. List the factors affecting specific energy consumption.

4. Classify electric traction equipment.

5. What is uninsulated overlap?

6. List three methods of raising and lowering of pantograph.

7. What are the constituents of traction substation?

8. Write a brief note on circuit breaker in traction substation.

9. List the requirements of train lighting.

10. Draw a single-battery system.

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 the expression for maximum speed of a trapezoidal speed time curve. 5

(b) The average speed of an electric train on level track is 35 kmph between two stations which are 1·5 km apart. Find the maximum speed, time duration for acceleration, free run and retardation when the acceleration and retardations are 2 kmphps, 3 kmphps respectively. 5

12. *(a)* Define coefficient of adhesion. 4

(b) What are the factors affecting the coefficient of adhesion? 3

(c) What are the methods of improving coefficient of adhesion? 3

13. A 250 tonnes train with 10% rotational inertia is started with uniform acceleration and reaches a speed of 50 kmph in 25 seconds on level road. Find the specific energy consumption if the journey is to be made according to simplified trapezoidal speed-time curve. The acceleration is 2 kmphps, braking retardation 3 kmphps and distance between stations is 2·4 km, assume efficiency of motors as 0·9 and track resistance as 5 kg/tonne.

14. Draw a neat sketch of single catenary construction of OHE and explain.

15. Write the annual maintenance carried for *(a)* section insulator assemblies and *(b)* isolator, *(c)* overlaps and *(d)* neutral sections.

16. *(a)* Explain booster transformer with a neat diagram. 6

(b) Explain bow collector. 4

17. Describe end-on generation and mid-on generation.

18. Explain major equipment in traction substation with neat diagram.

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