4744

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

DEEE - VI 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)   Answer should be brief and straight to the point and shall not exceed five simple sentences.

1   Describe Kando system.

2   Write an expression of traction effort of traction motors in terms of maximum torque and gear ratio.

3   State the factors affecting specific energy consumption.

4   What is the importance of neutral section in Overhead Equipment ?

5   Write any six important requirements of a traction motor.

6   List the various constituents of power supply arrangement for A C track electrification.

7   Discuss about the location of substation with regard to A C and D C system of electric traction.

8   Mention three protective devices A C electric traction and write their functions.

9   Draw the schematic diagram of Single Battery System.

10   What are the requirements of Railway coach air conditioning ?

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PART - B   10×5=50

Instructions :   *(1) Answer any **FIVE** questions.*
                       *(2) Each question carries **TEN** marks.*
                       (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11   The speed time curve of a train consists of

    (i)   Uniform acceleration of 5 kmphps for 25 seconds.

    (ii)   Free running for 21 minutes.

    (iii)   Uniform deceleration of 5 knphps to stop the train.

    (iv)   A stop of 5 minutes.

    Find the distance between the stations, the average speed and schedule speed.

12   An electric locomotive is required to haul a train of 10 coaches, each weighing 30 tonnes on the mainline service requiring an initial acceleration of 0.8 kmphps up a gradient of 1 in 100.

    Estimate the adhesive weight needed and hence the number of driving axles the locomotive must have if the permissible axles load of 21 tonnes. Allowance for rotational inertia to be 5% for the coaches and 15% for the locomotive, maximum coefficient of adhesion of 0.15 and the tractive resistance is 4 kg/tonne.

13   Derive the expression for tractive effort during :

    (i)   Acceleration period, (ii) Free Running, (iii) Up Gradient

14   Explain how insulated overlap is different from uninsulated overlap.

15   List different types of catenary construction for traction system. Describe any two of them with neat sketch.

16   Write short notes on the following :

    (i)   Pantograph, (ii) Booster Transformer

17   Describe about circuit breaker and interrupter equipments used at AC traction system.

18   (a)   What is 'end of Generation' ? List any four advantages of this method.   **7**

        (b)   Draw the protection scheme of 25 kV Catenary system using mho relay.   **3**

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