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# B.E. (Electrical) (Semester - VIII) Examination, May - 2015
## Electrical Utilization and Transaction
## Sub. Code : 49428

**Day and Date : Tuesday, 05 - 05 - 2015** **Total Marks : 100**

**Time : 2.30 p.m. to 5.30 p.m.**

**Instructions :**
1) **Attempt any 3 questions from each section.**
2) **Figures to right indicate full marks.**
3) **Assume suitable data if necessary.**

## SECTION - I

*Q1)* a) Explain different types of composite systems used for track electricification. [8]

b) A train is required to run between two stations 1.5 km apart at a schedule speed of 36 kmph. The duration of stops being 25 seconds. The braking retardation is 3 kmphps assuming a trapezoidal speed - time curve. Calculate the acceleration if the ratio of maximum speed to average speed is to be 1.25. [8]

*Q2)* a) Explain the trapezoidal speed time curve in detail. [8]

b) An electric train has a quadrilateral speed time curve as follows.

i) Uniform acceleration from rest at 2 kmphps for 30 seconds.

ii) Coasting for 50 seconds

iii) Duration of braking 20 seconds

If train is moving a uniform up gradient of 10%, tractive resistance is 40 N/tonne rotational inertia effect 10% of dead weight, duration of station stop 15 seconds and overall efficiency of transmission gear and motor as 75%, find the schedule speed and specific energy consumption of run. [8]

*Q3)* a) Explain the term Specific energy consumption in detail and its significance. [8]

b) Explain different types of methods used for series - parallel control. [8]

*Q4)* Write short notes on any three [3 × 6 = 18]

a) Drum controller

b) Shunt and bridge transition

c) S - T curve for electric traction

d) Negative booster

*P.T.O.*

## SECTION - II

*Q5)* a) Explain regenerative braking and write the formula for energy returned during regenerative braking. [8]

b) Explain the heating and cooling times curves. [8]

*Q6)* a) Explain di - electric heating in detail. [8]

b) Explain in detail induction furnace. [8]

*Q7)* a) Explain Radiant and direct resistance heating in detail. [8]

b) Explain Laser beam welding. [8]

*Q8)* Write short notes on any three [3 × 6 = 18]

a) Classes of insulation.

b) Modes of heat transfer

c) Heating methods

d) Classification of electric welding

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