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B.E. (Electrical) (Part - IV) (Semester - VIII) Examination, April - 2016**ELECTRICAL UTILIZATION AND TRANSACTION****Sub. Code : 49428****Day and Date : Sunday, 17 - 04 - 2016****Total Marks : 100****Time : 03.00 p.m. to 06.00 p.m.**

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

SECTION - I

Q1) a) Derive equation for speed at end of coasting in case of quadrilateral speed time curve. **[8]**

b) An electric train weighting 300 tonnes runs 10% up gradient with following speed time curve: **[8]**

- i) Uniform acceleration of 1.5 kmph for 30 seconds.
- ii) Constant speed of 40 seconds.
- iii) Coasting for 30 seconds.
- iv) Braking at 2.5 kmph to rest.

Calculate the specific energy consumption if tractive resistance is 45N/tone, rotational inertia effect 10% overall efficiency of transmission and motor 75%.

Q2) a) Derive Expression for total tractive effort required for propulsion of train. **[8]**

b) 400 tonne goods train is to be hauled by locomotive up a gradient of 20% with acceleration of 1 kmph. coefficient of adhesion is 20%, track resistance 40N/tone and effective rotating masses 10% of dead weight. Find the weight of locomotive and number of axles, if axle load is not to increase beyond 22 tonne. **[8]**

P.T.O.

Q3) Write short notes on any three:

- a) Speed-time curves.
- b) Current Collectors.
- c) Multiple unit control.
- d) Negative Booster.

- Q4)** a) What is load equalization? How it is done with fly wheel design? [8]
b) Explain the term specific energy consumption in detail and its significance. [8]

SECTION - II

- Q5)** a) Explain suitability of D.C. Series motors for electric traction. [8]
b) Explain series-parallel control. Also find t_s , t_p and efficiency of starting using 2 D.C. motors. [8]

- Q6)** a) Explain different modes of heat transfer. [6]
b) Explain in brief methods of electrical heating. [4]
c) Derive equation to find dimensions of heating element made of wires of Circular cross section as well as rectangular conducting ribbons. [6]

- Q7)** a) Explain Principle of dielectric heating and its applications. [8]
b) Explain Radiant and direct resistance heating in detail. [8]

Q8) Write short note on any three: [3×6=18]

- a) Heating and cooling times curves.
- b) Laser beam welding.
- c) Induction Furnace.
- d) Classes of insulation.

