b) State and explain with sketches, the three important methods of transmission of mechanical power from traction motor to the driving wheels.

OR

10. a) Describe the various methods of drives which have been applied for transmitting motive power from motor shaft to driving wheel.

b) Write short notes on the following:

i) Tractive efforts

ii) Vehicle performance and energy consumption.

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Roll No .....

EX - 501

B.E. V Semester

Examination, December 2013

Utilization of Electrical Energy

Time: Three hours

Maximum Marks : 70

Note: 1) Answer five questions, choosing one question from each unit.
2) Assume suitable missing / misprint data if necessary.
3) All questions carry equal marks.

Unit - I

1. a) Explain the following:

i) Inverse square laws

ii) Lambert's cosine law of illumination.

b) Describe with a neat sketch the principle of operation of a fluorescent lamp. Mention the function of each component.

OR

2. a) An illumination on the working plane of 32 lux is required in a room of 50×10 meters. The lamps are required to be hung 4.0 meter above the work bench. Assume a utilisation factor of 0.5,lamp efficiency of 14 lumens per watt and candle power depreciation of 0.2, estimate number, rating and deposition of the lamps. Assume a suitable value of space ratio.

b) Determine the maximum and minimum illumination on the surface of a square table measuring 1 meter each side when a lamp with 400 c.p in all directions is suspended above the centre of the table at a height of 2 meter.

Unit - II

3. a) Describe with neat sketches the various methods of electric resistance welding. Give the comparision between resistance and arc welding.

b) Describe the construction and operation of a transformer used for electric arc furnace.

OR

4. a) What is dielectric heating? How this is different from induction heating? Explain the factors on which dielectric loss in a dielectric material depends.

b) Explain principle of induction heating with reference to direct core type and indirect core type furnaces.

Unit - III

5. a) Enumerate the various features of tram ways and trolley bus.

b) Explain rheostatic braking as applied to the following:

(i) DC shunt motor.

(ii) Synchronous motor.

OR

6. a) An electric train weighing 200 tonne is accelerated up a gradient of 1 in 250 at a mean acceleration of 1.5 kmph

i) the tractive effort required

ii) the output at the end of the acceleration period.

The train resistance is 4Kg/tonne and effective weight is 10% more than the dead weight.

b) Explain speed-time curves for electric tractions.

Unit - IV

7. a) Explain the following:

i) Individual drive

ii) Group drive

iii) Multi-motor drive

b) A 40 kW motor with a heating time constant of 120 minutes has a final temperature rise of 60°C on continuous rating. Calculate half hour rating of the motor for the same temperature rise, assuming that cool's down completely between each load periods. Motor has maximum efficiency occurs at 80% of its full load.

OR

8. a) Explain various factors which affect the selection of motor for a specific drive.

b) Describe various methods of electric braking used for braking of induction motor. Compare their advantages and disadvantages.

Unit - V

9. a) Give the essential electrical and mechanical characteristics