T.E Electrical VI CBGS 20/5/16
B302-40 UEE
B303-30

Q.P. Code : 584700

(3 Hours) [Total Marks : 80

N.B. : (1) Question **No.1** is **compulsory**.
(2) Attempt **any Three** questions out of remaining **Five** questions.
(3) Assume suitable **data** if **necessary** and **justify the same**.

1. Answer the following questions : **20**
   (a) Explain the importance of 25KV AC traction. How regenerative braking is done in Induction motors.
   (b) Explain the series-parallel configuration of EHV.
   (c) Derive an expression for the tractive effort produced by motor.
   (d) Compare the features of vapor compression and vapor absorption type of refrigeration with their application.

2. (a) What are the techniques of producing heat using electricity? Explain. **10**
   (b) Draw and explain the electric circuit of a domestic refrigerator. Why a compressor is required in refrigeration? **10**

3. (a) The distance between 2 stations is 1.6km and the average speed of the train is 40kmph. The acceleration, coasting and braking are 2, 0.16, 3.2 kmphps respectively. Determine the durations and the distances covered during acceleration, coasting and braking. **10**
   (b) Explain and prove how energy is saved by using series-parallel method of speed control as compared to rheostat control. **10**

4. (a) A 200 CP lamp is hung above the centre of a circular area of 5 mt diameter. Determine the illumination at the centre and at the periphery of the area. Also explain the laws of illumination with their applications. **10**
   (b) Write the block diagram and explain the working principle of CFL and LED lamps. **10**

5. (a) With neat diagrams, explain Reflection, Refraction, Diffusion and Absorption type light control with examples for each type. **10**
   (b) Analyse the quadrilateral speed time curve and derive an expression for the speeds V1, V2 in term of total time, α, β and βc. **10**

TURN OVER

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6. (a) A goods train weighing 300 tonnes is to be hauled by a locomotive up a gradient of 2% with an acceleration of 1 kmphps. Assume a co-efficient of adhesion of 20%, track resistance of 45 newtons/tonne and effective rotating masses of 10% of dead weight. If axle load is not to exceed 20 tonnes, determine the weight of locomotive and the number of axles. Also explain the importance and factors of co-efficient of adhesion in traction. **10**

(b) Explain how light measurements are done by using different devices. **10**
