

Duration – 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.

- Q 1.** Answer the following questions. **20**
A) Explain the techniques 3rd rail system.
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.
- Q 2 a)** What are the techniques of producing high frequency heat using electricity? **10**
Explain.
- Q 2 b)** Draw and explain the electric circuit of a domestic air conditioner. **10**
- Q 3 a)** Derive an expression for trapezoidal speed time curve. **10**
Q 3 b) Explain and prove how energy is saved by using series-parallel method of speed control as compared to rheostat control. **10**
- Q 4 a)** Write the design steps for interior illumination design. **10**
Q 4 b) Write the block diagram and explain the working principle of CFL and LED lamps. **10**
- Q 5 a)** With neat diagrams, explain Reflection, Refraction, Diffusion and Absorption type light control with examples for each type. **10**
Q 5 b) How to calculate the value of crest speed and distance between stations in quadrilateral speed time curve. **10**
- Q 6 a)** Justify why mechanical brakes and electrical brakes both are required for traction **10**
Q 6 b) Explain how lighting measurements are done by using different devices. **10**
