

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) What are the advantages of Track Electrification?  
 B) Explain the effect of adhesion on train movement.  
 C) Draw and explain any two types of photometers.  
 D) What are the different configurations of Hybrid Electric Vehicle?
- Q 2 a)** What are different methods of approximation of speed-time curves? **10**
- Q 2 b)** Write a detailed note on tractive effort. **10**
- Q 3 a)** Explain working principle of Incandescent Lamps. Compare Incandescent Lamps with Fluorescent Lamps. **10**
- Q 3 b)** Write short notes on different methods of electric welding. **10**
- Q 4 a)** Draw and explain different types of refrigeration cycle. **10**
- Q 4 b)** Draw and explain speed control methods for traction purpose **10**
- Q 5 a)** Write a short note on specific energy consumption of traction. **10**
- Q 5 b)** Explain and Compare the types of motors used for traction in EV/HEV **10**
- Q 6 a)** Draw and explain the electric circuit of a domestic refrigerator. **10**
- Q 6 b)** Explain and the working principle of arc furnace with emphasis on power supply requirements for the same. **10**

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