

**ELECTRIC TRACTION****3K-ESN-16E****Max. Marks : 100****Time : 3 Hrs.****Note :—**

1. Part 'A' may be attempted in first 6 pages of Answer Sheet.  
भाग 'क' के सभी उत्तर, उत्तर-पुस्तिका के प्रथम छ पृष्ठों में ही करने हैं।
2. Part 'B' may be attempted in rest of the Sheets of Answer Sheet.  
भाग 'ख' के उत्तर, उत्तर-पुस्तिका के अगले शेष पृष्ठों में लिखिये।
3. Answers may be given in English or Hindi.  
प्रश्नों के उत्तर अंग्रेजी अथवा हिन्दी में दीजिये।

**PART - A****1. Answer any ten questions.****(10x2=20)**

- (a) Which type of DC motor is used in electric locomotive?
- (b) What is the purpose of rectification in traction?
- (c) Name two types of systems used for transmission.
- (d) Draw diagram of compound catenary.
- (e) Which type of supply system is mostly used in electric traction?
- (f) Why the cadmium copper catenary is used for O.H. line?
- (g) Write the name of two types of breaking in electric traction.
- (h) What type of insulator used in traction?
- (i) What is train resistance?
- (j) Which railway system has minimum acceleration?
- (k) Why negative booster is used in DC traction system?
- (l) What is average speed?
- (m) How many wires are required in trolley bus?
- (n) What is the voltage level of 3 AC system?

**2. Attempt any five questions.****(5x4=20)**

- (a) Name the systems of electric traction with at least two examples of each.
- (b) What is the difference between rheostatic breaking and plugging?

- (c) Explain speed time curve on sub-urban.
- (d) What is the function of pantograph operating equipment in electric locomotive?
- (e) Compare the DC system and AC system of electric traction.
- (f) What are those factors which effect the specific energy consumption of a train?
- (g) Explain methods of obtaining good power factor.
- (h) What is the high acceleration linear inductive motors.

### PART - B

Answer any three questions.

(3x20=60)

- 3. Explain (a) Interference with communication system.  
(b) compound catenary.
- 4. What are the different types of pantographs used for collecting the current from over head line? Explain the working of any one.
- 5. Explain (a) Electric Breaking.  
(b) Speed control of DC motor.
- 6. Discuss the following :  
(a) Auxiliary contacts.  
(b) Mechanics of train movement.
- 7. Write short note (Any two) :
  - (a) Earth return protection of underground installation against corrosion.
  - (b) Neutral Section.
  - (c) Advantages of electric traction over other methods of traction system.