

17640

**21819**

**3 Hours / 100 Marks**

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Answer each next main Question on a new page.
  - (3) Illustrate your answers with neat sketches wherever necessary.
  - (4) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**20**

- (a) List four constituents of supply system.
- (b) List four factors which decides cross section of overhead contact wire.
- (c) What are track circuits ? State any two functions of it.
- (d) State two functions of auxiliary circuit of Ac locomotive.
- (e) Explain the means to improve reliability of locomotive.
- (f) Explain why LEM is called as wheel less drive.
- (g) List four important features of moving primary & fixed secondary single sided LIM.

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**P.T.O.**

**2. Attempt any TWO of the following :****16**

- (a) List four miscellaneous equipments at control post with function of each.  
Draw the labelled diagram of traction substation.
- (b) State the function of following :
- (i) Feeding Post
  - (ii) Sectioning & Paralleling Post
  - (iii) Sub-sectioning Post
  - (iv) Elementary Section
- (c) (i) List out special features of traction transformer as compared to conventional transformer.
- (ii) Explain the function or need of traction substation.

**3. Attempt any TWO of the following :****16**

- (a) (i) What is OHE ? State its function & draw the simplest form of OHE showing various parameters on it.
- (ii) Compare uninsulated overlap & insulated overlap in four point.
- (b) (i) State the function of Neutral section & section Insulator.
- (ii) Compare conductor Rail system & overhead system used for supplying power in electric traction in four point.
- (c) (i) Draw the labelled diagram of pole collector & bow collector.
- (ii) List three advantages with one application of Pantograph collector.

**4. Attempt any TWO of the following :****16**

- (a) (i) List four functions of Railway signalling.
- (ii) Draw the block diagram of remote control system used in supervisory control.
- (b) (i) State the function of colour light signals.
- (ii) State the suitability of colour light signals & also state its three types.
- (c) (i) List any two requirements of train lighting.
- (ii) List four causes of failure of underframe generating equipments.

**5. Attempt any TWO of the following :****16**

- (a) (i) Draw the labelled diagram of power circuit of AC locomotive.
- (ii) State the function of following equipments in power circuit of AC locomotive :
  - (A) Tap Changer                      (B) Traction Transformer
  - (C) Circuit Breaker                  (D) Smoothing Reactor
- (b) (i) State the function of contactors in electric locomotive & also list its any two types.
- (ii) List any four equipments used in auxiliary circuit of AC locomotive.
- (c) (i) Classify types of locomotive on the basis of
  - (A) Types of services
  - (B) Types of Track Gauge
  - (C) Types of supply
- (ii) State the function of relay used in electric locomotive & also state its two types.

**P.T.O.**

**6. Attempt any TWO :****16**

- (a) Explain with neat sketch protection of locos against lightning surges.
  - (b) Explain Ideal Maintenance of electric locomotive.
  - (c) List four strengths & four weaknesses of LEM propelled Railway traction system.
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