

17640

15116

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any THREE of the following :

12

- (i) List various miscellaneous equipments at control post. State use of each.
- (ii) State use of any four relays for the protection of traction transformer.
- (iii) State the meaning of various terms of OHE labelled in Fig. No. 1. Give their normal values.

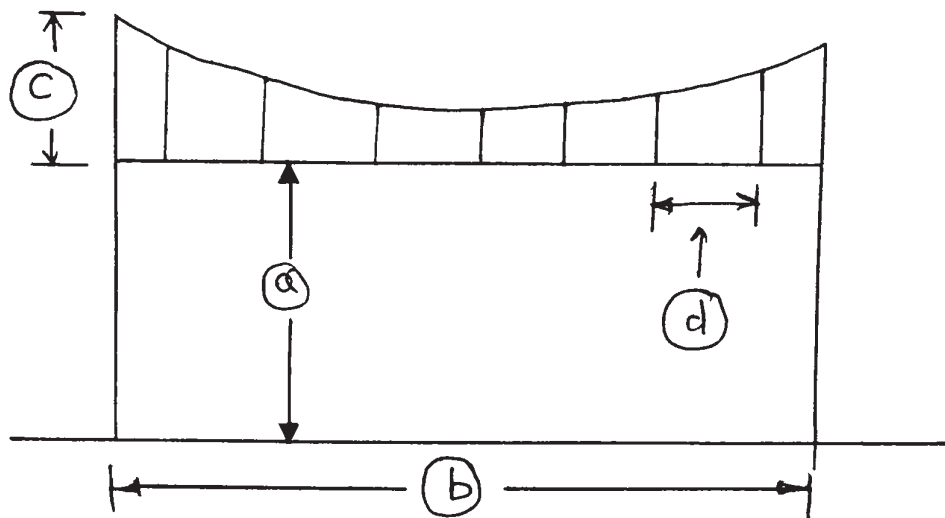


Fig. No. 1

P.T.O.

(iv) Give purpose and location of following signals.

- (1) warner
- (2) co-acting
- (3) shunt
- (4) detonating

b) Attempt any ONE of the following : **6**

- (i) For a traction transformer circuit breaker state –
 - (1) rated current and rupturing capacity.
 - (2) any two tests it should be capable of withstanding.
 - (3) overall tripping time and relay time.
- (2) Draw symbols of any six signalling boards of OHE. Write the meaning of each.

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

- a) Draw a neat sketch of traction substation. Label various components of it.
- b) Draw a neat labelled diagram of Automatic Weight Tension and Temperature Compensation and give any two advantages of the same.
- c) Write any four points that state how a traction transformer is different from ordinary transformer.
- d) List any four advantages of multiaspect colour light signals.
- e) State the function of a contactor in a power circuit of locomotive. List different types of it and state one application of each.
- f) Give purpose and location of –
 - (i) uninsulated overlap
 - (ii) insulated overlap
 - (iii) neutral section
 - (iv) section insulator

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

- a) Write any four important points related to the construction of feeding post.
- b) Draw a neat sketch of stitched catenary. State the speed limit for –
 - (i) 10 m Y
 - (ii) 20 m Y of this type
- c) Draw the schematic connections and state related output voltages in case of step by step on load tap changing using center tap reactor.
- d) With the help of neat sketch of a double battery parallel block system write sequence of operations for –
 - (i) one battery charging
 - (ii) both batteries charging
- e) For a pantograph write any two –
 - (i) types
 - (ii) advantages
 - (iii) methods of raising
 - (iv) materials for collector strip
- f) Compare DC and AC track circuits on –
 - (i) Length of circuit
 - (ii) Application
 - (iii) Effect of stray currents
 - (iv) Maintenance

- 4. Attempt any FOUR of the following :** **16**
- a) List any four characteristics of efficient maintenance.
 - b) Write a step by step procedure of obtaining constant output using three brush generator.
 - c) State the necessity of feeding and sectioning arrangement in Traction SS. Draw its sketch also.
 - d) Draw a neat labelled sketch of faiveley type pantograph.
 - e) State any four reasons of failure of under frame generation equipment.
 - f) Draw a neat sketch of power circuit of three phase locomotive.
- 5. Attempt any FOUR of the following :** **16**
- a) State any four limitations of Arno convertor.
 - b) List any four strengths of LIM propelled railway traction.
 - c) Draw a neat sketch of earth fault protection of auxiliary circuit of electric loco. State the function of relay and isolating resistance.
 - d) State the function of following auxiliaries used in electric locomotive.
 - (i) batteries
 - (ii) compressor
 - (iii) blower
 - (iv) exhauster
 - e) Write any four advantages of VF signalling over DC signalling.
 - f) Draw a neat sketch of moving-primary fixed-secondary double sided LIM. Write one advantage and one disadvantage of it.

6. a) Attempt any THREE of the following :**12**

- (i) State the following -
 - (1) Position of head light
 - (2) Supply voltage for flasher light
 - (3) Colours used for marker light
 - (4) Frequencies for engine horn.
- (ii) State the nature of protection provided for following types of faults.
 - (1) Overvoltage
 - (2) Under voltage
 - (3) High air pressure in air circuit
 - (4) Low air pressure in air circuit
- (iii) State one application each for technically feasible LEM propelled transport system based on suspension used.
(Any four)
- (iv) Give meaning of the term - defect. State effects of it. Also give classification of it and methods to eliminate them.

b) Attempt any ONE of the following :**6**

- (i) State the function of following components related to mimic diagram.
 - (1) PL
 - (2) OPL
 - (3) CHL
 - (4) GCK
 - (5) LTK
 - (6) ARK
 - (ii) Give broad classification of maintenance - with meaning of each type. State the factors on which ideal maintenance of electric rolling stock is judged. Give any two means to improve any one factor of these.
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