

17418

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. a) **Attempt any SIX of the following:** **12**
- (i) Enlist modes of transportation system.
 - (ii) State the necessity of cross drainage works for roads.
 - (iii) Enlist two advantages of railways.
 - (iv) Define ‘Coning of wheel’.
 - (v) State different types of railway stations.
 - (vi) Define - HFL and free board.
 - (vii) Define - pier and abutment in bridge.
 - (viii) State any two purposes of providing tunnels.

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- b) **Attempt any TWO of the following:** **8**
- (i) State the basic requirements of good alignment for railway track.
 - (ii) State the points to be considered in connection with bridge approaches.
 - (iii) Draw a neat labelled sketch of suspension bridge.
2. **Attempt any FOUR of the following:** **16**
- a) Define 'Alignment'. State the factors governing rail alignment.
 - b) State the necessity of railway track maintenance.
 - c) State the duties of permanent way inspector and gang mate.
 - d) State the factors affecting selection of site of a bridge.
 - e) Define:
 - (i) Effective span
 - (ii) Clear span
 - (iii) Economical span
 - (iv) Waterway
 - f) Define culvert. Enlist types of it and draw a sketch of any one.
3. **Attempt any TWO of the following:** **16**
- a) Draw a neat cross section of Broad Gauge (B.G) single track in cutting and label its parts.
 - b) Explain the types of gradient in railway track.
 - c) Draw a neat line sketch of the following:
 - (i) Cross over
 - (ii) Scissor crossover
 - (iii) Diamond crossing
 - (iv) Triangle

- 4. Attempt any TWO of the following: 16**
- a) Classify the bridges according to function, material, span and alignment.
 - b) Draw plan and sectional elevation of bridge showing all important component parts.
 - c) State the functions of bridge bearing and also state the types of bridge bearings with neat sketches.
- 5. Attempt any TWO of the following: 16**
- a) Classify the tunnels according to shape and size, position of alignment, materials and purpose with necessary suitable sketches.
 - b) State the methods of tunneling in soft rock and hard rock. Explain any one method with neat sketch.
 - c) Define 'Tunnel ventilation' state two purposes of it. Enlist method ventilation of tunnel and explain any one.
- 6. Attempt any FOUR of the following: 16**
- a) Explain marshalling yard with a neat sketch. Also state its types.
 - b) State any two advantages and disadvantages of tunnel
 - c) Explain in brief process of transferring center line inside the tunnel with a neat sketch.
 - d) Define 'Shaft'. State the purpose of providing shaft in tunnel.
 - e) Draw tunnel cross section of railway track.
 - f) State the types of drilling equipments and explosives used in tunneling.
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