

# 17418

16117

**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) Assume suitable data, if necessary.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) 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 necessity of cross drainage work for roads.
  - (ii) State the factors affecting choice of transport.
  - (iii) State any two characteristics of transport by railways.
  - (iv) Define cant deficiency.
  - (v) State different types of railway stations.
  - (vi) Define afflux and scour.
  - (vii) State the suitability of well foundation used for bridges.
  - (viii) State any two purposes for providing tunnels.

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- b) **Attempt any TWO of the following:** **8**
- (i) What are the basic requirements for good alignment for railway track.
  - (ii) Explain important points to be noted in connection with bridge approaches.
  - (iii) Differentiate between cantilever and suspension bridge.
2. **Attempt any FOUR of the following:** **16**
- a) Explain different gauges of railway track and define negative cant.
  - b) State the necessity of railway track maintenance.
  - c) State any four characteristics of Permanent Way Inspector.
  - d) Which data is required to be collected for design of bridge?
  - e) Define abutment of a bridge. State its functions.
  - f) With the help of neat sketch explain prestressed girder bridge.
3. **Attempt any TWO of the following:** **16**
- a) Draw neat cross section of Broad Gauge (B.G.) single track in embankment and label its parts.
  - b) Differentiate between fish plate and bearing plate.
  - c) Explain ideal requirements of permanent way.
4. **Attempt any TWO of the following:** **16**
- a) Draw plan of bridge showing all important component parts. Also define the following terms.
    - (i) Effective span
    - (ii) Afflux
    - (iii) Water Way
    - (iv) Wing wall
  - b) Classify bridges according to function, materials, span and according to level of bridge floor.
  - c) Give the requirements of ideal bearings and state types of bearings for steel bridges along with suitable sketches.

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

- a) Classify tunnels according to shape and size, according to position of alignment, materials (type of soil) and purposes, with necessary suitable sketches.
- b) Define lining of tunnel and tunnel ventilation. State purposes of both in detail.
- c) Describe heading and bench method of tunneling in hard rock with neat sketch.

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

- a) Draw the line sketch diamond crossing and cross over.
  - b) Identify different operations involved in tunnelling in hard rock.
  - c) Explain full face method of tunnelling with neat sketch.
  - d) Draw cross section of tunnel for a double line broad gauge railway track and label the parts.
  - e) Define tunnel and state any two advantages and any two disadvantages of tunnel.
  - f) What is tunnel investigation? State its necessity in detail.
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