

# 22403

**11920**

**3 Hours / 70 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. Attempt any FIVE of the following:** **10**
- Define permanent way.
  - List the types of spikes to fix the rails.
  - Define points and crossing.
  - State the requirements of rail alignment.
  - List the types of culvert.
  - State the classification of station yards.
  - List the factors affecting size of tunnel.
- 2. Attempt any THREE of the following:** **12**
- Describe in brief prevention of creep of rail.
  - Draw a neat labelled sketch of permanent way in embankment.
  - Describe in brief caisson foundation for a bridge with neat sketch.
  - Discuss the requirements of a standard rail joint.

P.T.O.

- 3. Attempt any THREE of the following:** **12**
- a) Explain in brief expansion bearing for steel girder bridge.
  - b) State the functions and requirements of a pier.
  - c) Draw a neat labelled sketch of a plan of bridge showing all its components.
  - d) Define following terms.
    - (i) Economic span
    - (ii) Afflux
    - (iii) Waterway
    - (iv) Free board.
- 4. Attempt any THREE of the following:** **12**
- a) Discuss the advantages and limitation of prestressed bridge.
  - b) Differentiate between permanent bridge and temporary bridge.
  - c) State the necessity of providing tunnel shaft.
  - d) Suggest suitable situation for Raft foundation and Pile foundation.
  - e) Explain Pre-monsoon inspection of a bridge.
- 5. Attempt any TWO of the following:** **12**
- a) Explain cant deficiency with its values.
  - b) Explain coning of wheels with neat sketch.
  - c) Describe the functions of any six tools required for rail track maintenance.
- 6. Attempt any TWO of the following:** **12**
- a) State the purpose of providing tunnel lining and state the factors affecting type of lining.
  - b) Describe in brief with neat sketch construction of tunnel with needle beam method.
  - c) State the purpose of tunnel maintenance and discuss the measures to be taken for proper maintenance.
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