

# 22403

**21819**

**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) Assume suitable data, if necessary.  
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- Write two merits of roadways over railways.
  - List the types of rail gauge.
  - Define cant deficiency and negative cant.
  - Give two purpose of station yard.
  - Write the necessity of temporary bridge.
  - List out the components of left hand turnout.
  - Classify tunnels based on its purpose.

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- 2. Attempt any THREE of the following:** **12**
- a) Write the ideal requirements of permanent way.
  - b) Explain the functions of ballast.
  - c) Classify the bridges based on:
    - (i) Span of bridge
    - (ii) Purpose of bridge.
  - d) Discuss the factors affecting selection of rail gauge.
- 3. Attempt any THREE of the following:** **12**
- a) Describe the factors affecting site selection for construction of bridge.
  - b) Define the following:
    - (i) Economic span
    - (ii) Afflux
    - (iii) Scour depth
    - (iv) Freeboard
  - c) Explain the functions of following component parts of a bridge:
    - (i) Pier
    - (ii) Abutment
    - (iii) Bearing
    - (iv) Wing wall.
  - d) Write the functions of bridge bearing. Also write its types.

- 4. Attempt any THREE of the following:** **12**
- a) Write two advantages and two disadvantages of pre-stressed bridge.
  - b) Explain the sequential steps involved in bridge construction.
  - c) Describe fore-poling method of tunneling in soft rock.
  - d) Draw the labelled sketches of the following:
    - (i) Splayed wing wall.
    - (ii) Return wing wall.
  - e) Give the points to be observed during pre-monsoon and post monsoon inspection.
- 5. Attempt any TWO of the following:** **12**
- a) Explain the causes of creep of rail. Suggest preventive measures against it.
  - b) Explain the necessity of tilting of rail with neat sketch.
  - c) Explain the duties of following personnels in rail track maintenance.:
    - (i) Permanent way inspector
    - (ii) Gang mate
    - (iii) Key man.
- 6. Attempt any TWO of the following:** **12**
- a) Describe the survey work required for proposed tunnel construction work.
  - b) Discuss the purposes of tunnel lining.
  - c) Explain the tunnel ventilation using mechanical method.
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