

# 17418

**14115**

**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. Attempt any TEN of the following: **20****
- a) Define the term 'Rail gauge'.
  - b) Write two advantages of tunnels
  - c) Enlist four types of Rail joint.
  - d) Define 'Gradient' and 'Super elevation'
  - e) Define point and crossing.
  - f) Enlist four types of yards.
  - g) Define Tunnel Engineering.
  - h) Write two requirement of Piers.
  - i) Enlist two function of Abutment.

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- j) Enlist the explosive commonly used in tunnelling work.
- k) What do mean by Mucking.
- l) Define H.F.L. and culvert.
- m) Define Negative cant.
- n) State the purpose of fish plate.
- o) State types of bridge floorings.

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

- a) State the role of transportation in the development of nation.
- b) Compare bridge approaches in cutting and embankment.
- c) What are the various zones of Indian Railways?
- d) State any four factors affecting the Rail Alignment.
- e) Draw neat sketch of standard c/s of B.G. in cutting and embankment.
- f) State types of bridge foundations.

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

- a) Define creep of Rails? What are its causes.
- b) Explain with sketch coning of wheels.
- c) Write any four functions of Ballast.
- d) Define gradient and State its types.
- e) Draw the line sketch of diamond crossing and cross over.
- f) Explain clear span, effective span and economical span of bridges.

- 4. Attempt any TWO of the following:** **16**
- a) Name methods used for tunnelling in hard rock. Explain any one with sketch.
  - b) Classify tunnels based on shape and purpose. Draw four types of shapes of tunnels used in highways.
  - c) State points to be considered in special maintenance of bridge.
- 5. Attempt any FOUR of the following:** **16**
- a) Define culvert? Explain any one type with neat sketch.
  - b) What is Rocker-Roller bearing? Draw a neat sketch of it.
  - c) State the factors governing the selection of a bridge site.
  - d) Write a note on Inspection of bridge.
  - e) Compare R.C.C. bridge and Steel bridge (any four).
  - f) List the important equipments and machines used in tunnel construction with their use.
- 6. Attempt any FOUR of the following:** **16**
- a) What is the necessity of ventilation of tunnels? Write four points, name methods of ventilation.
  - b) Explain the type of survey required during tunnel construction including laying its centre line.
  - c) Write four points about necessity of tunnels.
  - d) Write advantages and disadvantages of tunnel construction (two each).
  - e) State classification of tunnels.
  - f) Define the following terms:
    - (i) Pier
    - (ii) Approaches
    - (iii) Wingwall
    - (iv) Causeway
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