

# 17602

**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 THREE of the following:** **12**
  - (i) State any four characteristics of road transport.
  - (ii) State the classification of urban roads.
  - (iii) State any four purposes of reconnaissance survey.
  - (iv) Enlist the drawings required for road project.
  
- b) **Attempt any ONE of the following:** **6**
  - (i) Calculate the stopping sight distance for two way traffic in a single lane road. The design speed is 74 kmph. Assume reaction time of driver as 2.8 second, coefficient of friction 0.6 brake efficiency as 50%.
  - (ii) Calculate super elevation required for a road of 7.0 wide on curve of 250 m radius for permissible speed of 100 kmph. The coefficient of friction is 0.15.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Define camber? State IRC values of camber for different roads.
  - b) Define overtaking zone? Why it is provided on highway.
  - c) Define gradient. Explain types of gradient with IRC recommendation.
  - d) State the factors on which design speed depends.
  - e) State the uses of following equipments during construction of a highway:
    - (i) Scrapper
    - (ii) Grader
  - f) State the requirements of good quality material which plays the major role in highway construction.
- 3. Attempt any FOUR of the following:** **16**
- a) Define super elevation and state maximum and minimum values of super elevation.
  - b) Draw typical C/S of National highway cutting.
  - c) State various types of curves provided on hill road? Draw a neat sketch of any one.
  - d) Differentiate between flexible and rigid pavement.
  - e) Explain the procedure of WBM road construction.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Draw a neat sketch of a pavement. State the functions of each components.
  - (ii) Draw following traffic signs.
    - 1) Oneway
    - 2) Stop
    - 3) Speed limit
    - 4) No parking
  - (iii) Draw the sketches of Rotary interchange and Rotary island.
  - (iv) State the necessity of maintenance of roads.

- b) **Attempt any ONE of the following:** **6**
- (i) Define soil stabilized road? Explain any one method of soil stabilization.
  - (ii) Describe in brief with neat sketch joints in concrete road.
- 5. Attempt any FOUR of the following:** **16**
- a) State uses of traffic volume study.
  - b) State four preventive measures for land slides.
  - c) Draw a layout of Hot mix bitumen plant
  - d) Enlist different types of roller and explain anyone in brief.
  - e) Describe in brief classification of maintenance operation.
  - f) Define the following:
    - (i) Kerbs
    - (ii) Right of way
- 6. Attempt any FOUR of the following:** **16**
- a) Draw a neat sketch of dragline and label the component parts.
  - b) Describe alignment survey for hill roads.
  - c) Describe in brief working of power shovel.
  - d) Explain the maintenances of bituminous roads.
  - e) Explain the working of JCB with suitable line sketch.
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