313323

12425
3 Hours / 70 Marks Seat No. | | | | | | | | |

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. Solve any FIVE of the following : **5 × 2 = 10**

(a) Enlist the different modes of transportation.

(b) State the purpose of Camber.

(c) Define Land Slides.

(d) Define Passenger Car Unit (PCU).

(e) State necessity of highway maintenance.

(f) Enlist the requirements for an ideal road alignment. (any two)

(g) Define Super-Elevation.

2. Solve any THREE of the following : **3 × 4 = 12**

(a) Classify the roads according to the Nagpur Road Plan.

(b) Define the following terms :

(i) Carriageway

(ii) Shoulder

(iii) Stopping Sight Distance

(iv) Gradient

(c) Write down IRC recommendations for gradient of different types of road.

(d) Calculate the stopping sight distance for a road having design speed of 60 kmph. The break efficiency is 50% and the reaction time of the driver is 2.5 seconds.

3. Solve any THREE of the following : **3 × 4 = 12**

(a) State the various factors affecting design speed.

(b) Illustrate the construction methods of Cement concrete road in respect to :

(i) Alternate Bay Method

(ii) Continuous Bay Method

(c) Differentiate Rigid pavement and Flexible pavement in respect to :

(i) Construction cost

(ii) Maintenance cost

(iii) Durability

(iv) Flexibility

(d) State the various causes of landslides in respect to Hill roads.

4. Solve any THREE of the following : **3 × 4 = 12**

(a) Explain components parts of road pavement with respect to :

(i) Wearing course

(ii) Base Coat

(iii) Base Course

(iv) Sub-base course

(b) Illustrate the causes of failure in flexible pavement with necessary sketches.

(c) Explain remedial measures for Pothole formation and Rut formation in case of flexible pavements.

(d) Draw the following road sings :

(i) One-way sign

(ii) Overtaking prohibited sign

(iii) No parking sign

(iv) Speed limit sign

(e) Explain sub surface drainage of roads with its types and neat sketches.

5. Solve any TWO of the following : **2 × 6 = 12**

(a) Draw a neat sketch of National Highway in Embankment and label the following components :

(i) Carriageway

(ii) Shoulder

(iii) Roadway

(iv) Side drain

(v) Permanent land width

(vi) Boundary stone

(b) Design super elevation for a 7 m wide road with design speed 80 kmph on a curve of radius 160 m. Consider co-efficient of friction 0.15.

(c) Explain the following road curves with neat sketch :

(i) Horizontal Curves

(ii) Vertical Curves

6. Solve any TWO of the following : **2 × 6 = 12**

(a) Draw a neat sketch of cross section of Hill Road and label the following components :

(i) Breast wall

(ii) Parapet wall

(iii) Retaining wall

(iv) Catch water drain

(v) Road pavement

(vi) Side drain

(b) Enlist different types of traffic Islands and explain any one in brief with neat sketch.

(c) Explain cement concrete road joints with necessary sketch in respect to :

(i) Expansion joints

(ii) Contraction joints

(iii) Warping joints

(iv) Construction joints

(v) Longitudinal joints

(vi) Dowel bar
