17602

16172

3 Hours / 100 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. (A) Attempt any THREE : **12**

(a) Classify road as per Nagpur plan.

(b) State the modes of transportation and explain any one.

(c) State the objects of preliminary survey.

(d) State the four factors affecting road alignment.

(e) Define and states values of following term with IRS standard for (i) Gradient, (ii) Right of way

(B) Attempt any ONE of the following : **06**

(a) Define super elevation and state the method of designing super elevation.

(b) Calculate the minimum sight distance required to avoid a head on collision of two cars approaching from opposite direction, at 80 and 50 km/h. Assume a reaction time 2.5 sec, coeff. of friction of 0.7 and break efficiency of 50% in either case.

2. Attempt any FOUR : **16**

(a) State the object of reconnaissance and location survey.

(b) Define cross drainage work. State necessity of cross drainage work.

(c) State types of Camber and explain any one with a neat sketch.

(d) Define Borrow pits, spoil bank, lead and lift.

(e) State eight difference between rigid pavement and flexible pavement.

(f) Describe procedure of construction of water macadam road.

3. Attempt any FOUR : **16**

(a) The speed overtaking and overtaken vehicle are 80 and 40 kmph. respectively on two-way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2.

(i) Calculate safe of overtaking sight distance.

(ii) Mention the minimum length of overtaking zone.

(b) The radius of horizontal circular curve is 100 m. The design speed is 50 kmph. and the design coeff. of lateral friction is 0.15.

(i) calculate the super elevation required if full lateral friction is assumed to developed.

(ii) calculate the coeff. friction needed if no super elevation is provided.

(c) Describe in brief causes of landslides.

(d) State objectives and functions of pavement.

(e) Describe in brief joints in rigid pavement.

4. (A) Attempt any THREE : **12**

(a) Define : asphalt, emulsion, cut back, tar.

(b) Define : PCU, Traffic control device.

(c) Define : Traffic island and draw neat sketch of circular rotary island.

(d) Define road drainage and state its purpose.

(B) Attempt any ONE of the following : **06**

(a) Describe with a neat sketch of CBR test on soil as subgrade material.

(b) Define Soil stabilized road. Explain one method of soil stabilization.

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

(a) Draw a cross-section of Highway embankment and label its components.

(b) Draw sign for the following :

(i) One way

(ii) No parking

(iii) Harrow bridge

(iv) Speed limit

(c) State and explain classification of maintenance of road.

(d) Explain working of power shovel with suitable line sketch.

(e) State the component parts of hill road with their function.

(f) Describe in brief component parts of a hot mixed bitumen plant.

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

(a) Enlist eight type of equipment used for excavation in construction of road.

(b) State four compacting equipment and its suitability.

(c) Draw a neat sketch of side drain and catch water drain.

(d) Explain maintenance of water bound macadam road.

(e) Explain working of bulldozer with suitable line sketch.
