

17602

21415

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 four characteristics of Road transport.
 - (ii) State classification of Urban Roads.
 - (iii) State four purposes of reconnaissance survey.
 - (iv) Define road alignment. Write four factor affecting it.
 - (v) Define design speed. Write four factor affecting it.

P.T.O.

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 of the road is 60 kmph. Assume reaction time of the driver as 2.5 seconds and coefficient of friction as 0.6.
- (ii) Draw a neat cross-section of state highway in cutting and show all components.

2. Attempt any FOUR of the following:

16

- a) List out the various drawings prepared for a highway project and explain the importance of any one drawing in brief.
- b) What is cross drainage work? Write necessity of cross drainage work.
- c) State any four factors on which super-elevation depends.
- d) Give types of camber with neat sketches.
- e) State different types of Tar used in construction of road with its suitability.
- f) State and explain functions of pavement components.

- 3. Attempt any FOUR of the following:** **16**
- a) Calculate the design speed of vehicle on a horizontal curve having radius of 100 m with permissible super elevation of 7%. Consider coefficient of friction 0.18.
 - b) Draw the cross section of a typical hill road and label any four components parts.
 - c) What are various types of curves provided on hill road? Draw neat sketch of any one of them.
 - d) State the requirements of good quality material which plays the major role in the highway construction.
 - e) What is pavement? State requirements of good pavements.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Define:
 - 1) Barrow pit
 - 2) Lead and lift
 - (ii) Define PCU and Traffic density.
 - (iii) Define traffic sign. Draw six types of traffic signs.
 - (iv) Differentiate between surface and sub-surface drainage.
- b) Attempt any ONE of the following:** **6**
- (i) What is soil stabilized road? Explain one method of soil stabilization.
 - (ii) Describe the procedure of construction of cement concrete pavement showing its components.

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

- a) Draw labelled sketch of circular shape and square shape rotary island.
- b) State the difference between alignment of hill roads and alignment of plain roads.
- c) Draw a neat cross-section of other District road in embankment in Rural area.
- d) Prepare the schedule of maintenance operation required for bituminous concrete road in the period from October to March in Maharashtra.
- e) State the use of following equipments during construction of highway.
 - (i) JCB
 - (ii) Grader
 - (iii) Plain Roller
 - (iv) Buldozer
- f) Write the component parts of a hot mixed bitumen plant and their specific use for construction of highway.

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

- a) Enlist equipments used for excavation in construction of Road.
 - b) Draw flow chart for working process of batch type Hot Mix plant.
 - c) Explain the various preventive measures that can be taken to avoid land slides.
 - d) Write the ideal requirements of Highway drainage system.
 - e) Draw a neat line sketch of dragline and labelled it.
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