22232

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) 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 FIVE of the following : **10**

(a) State and explain any two factors affecting road alignment.

(b) State any two characteristics of road transport.

(c) State the classification of urban roads.

(d) Define :

(i) Passenger Car Unit

(ii) Traffic Volume Study

(e) State the types of traffic islands.

(f) Define sight distance and state its types.

(g) Explain the necessity of drainage of roads (Any two points).

2. Attempt any THREE of the following : **12**

(a) State and explain various factors affecting design speed.

(b) Define camber and superelevation. State IRC values of camber and super-elevation for different types of roads.

(c) Explain the importance of gradient in road alignment.

(d) State the merits and demerits of WBM roads (Any two each).

3. Attempt any THREE of the following : **12**

(a) Differentiate between flexible and rigid pavement (Any eight points).

(b) Draw a neat labelled sketch of the cross-section of pavement and write the function of structural components of pavement.

(c) Explain the different types of road signs.

(d) Draw a neat sketch of any one type of hill road curve and explain it in detail.

4. Attempt any THREE of the following : **12**

(a) Explain the precautions that can be taken to avoid possibility of landslides in hilly region.

(b) Draw a neat labelled sketch of a typical cross-section of a hill road.

(c) Explain necessity of maintenance of roads.

(d) Justify the remedial measures for pothole formation and rut formation in the case of flexible pavements.

(e) Explain subsurface drainage of roads in detail.

5. Attempt any TWO of the following : **12**

(a) Calculate the stopping sight distance for a car moving with design speed 90 kmph. Assume total reaction time as 2.5 seconds.

Take co-efficient of friction = 0.7 and brake efficiency = 50%

(b) Explain the method of providing superelevation on roads. State the formula for providing minimum and maximum superelevation.

(c) Describe the procedure of construction of bituminous road. Also draw a sketch of the cross-section of bituminous road showing all its components.

6. Attempt any TWO of the following : **12**

(a) Construct a flowchart for step-by-step procedure of construction of a cement concrete road by continuous bay method. Explain the same.

(b) Draw the following road signs :

(i) Load limit

(ii) Keep left

(iii) Right hand curve

(iv) Hospital

(v) Width limit – 2 m

(vi) Speed limit = 60 kmph

(c) Draw the sketch of the collision diagram for (1) head on collision (2) rear end collision and (3) side sweep

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