22302

23124

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

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following : **10**

(a) Define Super-Elevation with a neat sketch.

(b) Define Camber with a neat sketch.

(c) What is Prime Coat ?

(d) What is Traffic Density ?

(e) Define PCU.

(f) State various types of curves provided on hill road.

(g) What is cross drainage work ?

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

(a) State and explain four points regarding requirement of an ideal road alignment.

(b) State and explain functions of pavement components.

(c) State the difference between alignment of hill roads and alignment of plain roads.

(d) Differentiate between surface and sub-surface drainage.

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

(a) State and explain any four factors on which super-elevation depends.

(b) Calculate the stopping sight distance for one way road having design speed 60 kmph and breaking efficiency of a vehicle 75%.

(c) Write difference between flexible pavement and rigid pavement.

(d) Give four situations where traffic volume study is used in road planning.

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

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

(i) Calculate the super-elevation required if full lateral friction is assumed to develop.

(ii) Calculate the coefficient of friction needed, if no super-elevation is provided.

(b) What are road markings ? State its types.

(c) What do you mean by land slides ? State four preventive measures for land slides.

(d) Draw a neat sketch of catch water drain.

(e) State the importance of road transportation in overall development of a country.

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

(a) The speed of overtaking and overtaken vehicles are 70 and 40 kmph, respectively on a two way traffic road. If the acceleration of a overtaking vehicle is 0.99 m/sec^2

(i) Calculate safe overtaking sight distance.

(ii) Mention the minimum length of overtaking zone, and

(iii) Draw a neat sketch of the overtaking zone and show the positon of the sign posts.

(b) Calculate the length of stopping sight distance for two way traffic in a single lane road having descending gradient of 2%. The design speed is 70 kmph. Assume reaction time of driver as 2.5 seconds and co-efficient of friction as 0.6.

(c) Write the names of road construction material. Also write their source and use.

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

(a) Explain in detail about rotary island with the help of neat sketches.

(b) What are traffic control devices ? State common devices used to control and regulate traffic with at least one use of it.

(c) State the methods of construction of cement concrete road. Explain any one.
