21718

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

(a) Write the classification of roads according to :

(i) Nagpur road development plan

(ii) Third road development plan

(b) Write the names of four modes of transportation. Write the medium used in each mode of transportation.

(c) Explain in brief any two surveys conducted before road construction.

(d) State the names of any four drawings & use of each drawing required for road construction.

(e) Define :

(i) Right of way

(ii) Reaction time

(iii) Distance kerb

(iv) Passing sight

(B) Attempt any ONE : **6**

(a) For a national highway the allowable speed is 60 kmph. If the radius of curvature of road is 300 m, calculate the superelevation to be provided for the road. Take co-efficient of friction = 0.15.

(b) Draw a c/s of national highway in embankment.

2. Attempt any FOUR : **16**

(a) What is location survey ? Which information is collected in location survey ?

(b) What is road alignment ? State the factors affecting road alignment.

(c) What is design speed ? State the factors affecting design speed.

(d) Which points should be kept in view during geometric design of roads ?

(e) What is surface dressing ? State its procedure.

(f) State the use of the following concrete road equipments :

(i) Template

(ii) Float

(iii) Screw

(iv) Edge plate

3. Attempt any FOUR : **16**

(a) What is superelevation ? State the methods of providing superelevation.

(b) Define camber. State the factors to be considered while providing camber for a road.

(c) Define :

(i) lead

(ii) lift

(iii) borrow pit

(iv) spoil bank

(d) State the functions of :

(i) catch water drain

(ii) breast wall

(iii) retaining wall &

(iv) cross drain in case of hill roads

(e) Write the names of four road construction materials. Write their source & use.

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

(a) Write the construction procedure of WBM road.

(b) What are the traffic islands ? How they help in controlling traffic ?

(c) Draw sketches of the following road signs :

(i) No entry

(ii) Speed breaker

(iii) Refreshment place

(iv) Overtaking prohibited

(d) Write the remedial measures in case of the following road defects :

(i) formation of ruts in case of earthen roads.

(ii) formation of pot holes in case of WBM roads.

(iii) bitumen bleeding in case of bituminous roads.

(iv) development of cracks in case of concrete roads.

(B) Attempt any ONE. **6**

(a) What is soil stabilization ? State its necessity. Explain any two methods of soil stabilization.

(b) Draw a c/s of pavement structure. Write the function of each component of pavement structure.

5. Attempt any FOUR : **16**

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

(b) Define :

(i) Land slide

(ii) Re-entrant curve

(iii) Salient curve

(iv) Hair pin bend curve

(c) Define gradient. State its types. State IRC specifications of gradients.

(d) Explain the following road defects :

(i) Ravelling

(ii) Mud pumping

P.T.O.

(e) Write the use of the following earth moving equipments :

(i) Scraper

(ii) JCB

(iii) Drag line

(iv) Roller

(f) Draw a neat sketch of any one

(i) Bulldozer

(ii) Drag line

(Draw line diagram only. No three dimensional sketch is essential.)

6. Attempt any FOUR : **16**

(a) Compare flat wheeled rollers & sheep foot rollers.

(b) Draw a flow diagram of hot mix bitumen plant.

(c) Draw a c/s of hill road & label the components.

(d) Explain in how many ways the water enters the body of the road.

(e) Write the names of the compacting equipments. Write four uses of the compacting equipments.
