Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PCCI 4302

Fifth Semester Examination – 2013

TRANSPORTATION ENGINEERING – I

BRANCH : CIVIL

QUESTION CODE : C-442

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest. The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10
   (a) What are the various requirements of an ideal highway alignment ?
   (b) What are the objects of providing transition curves on horizontal alignment of highways ?
   (c) State the objects of widening pavement on horizontal curves.
   (d) Enumerate various factors affecting practical capacity of road.
   (e) Define traffic rotary.
   (f) What are the various tests for judging suitability of road aggregates ?
   (g) What are the uses of bitumen emulsion ?
   (h) Draw a typical cross-section of a divided highway in urban area.
   (i) Differentiate Flexible and Rigid pavements.
   (j) What do mean by Mud Pumping ?
2. (a) Explain the necessity and objectives of highway planning. 5
   (b) Explain with sketches the various factors controlling the alignment of roads. 5
3. (a) Derive an expression for calculating the overtaking sight distance on a highway. 5
   (b) Find the stopping sight distance for a design speed of 65 kmph. Assume total reaction time as 2.5 seconds and design coefficient of friction as 0.36. What will be the sight distance requirement at a descending grade of 1 in 40 ? 5

P.T.O.

4. Explain superelevation. What are the factors on which the design of superelevation depends ? Derive an equation for finding the superelevation required if the design coefficient of lateral friction is 'f'.

A radius of 250 m has to be provided at a locality due to site restrictions in a National Highway with design speed of 100 kmph. Design the superelevation. Should there be restriction in speed ? (Assume suitable data as per IRC) 10

5. (a) What is the significance of road user characteristics in traffic engineering ? Discuss briefly the various factors which affect the road user characteristics and their effects in traffic performance. 5

(b) Discuss briefly the importance of highway maintenance. What are the general causes of pavement failures ? 5

6. (a) Explain the CBR method of pavement design and its uses. What are its advantages and limitations ? 5

(b) Draw a sketch of flexible pavement and show the component parts. Enumerate the functions of each component of the pavement. 5

7. (a) Define the following terms in bridge engineering : 5

(i) Scour depth

(ii) Afflux

(iii) Economic span

(iv) Linear waterway

(v) Free board.

(b) What are the requirements of an ideal bridge site ? Mention the various considerations important from the point of view of selection of a suitable site for the same. 5

8. Write short notes on the following : 5×2

(a) Softening point test on bitumen

(b) Passenger Car Unit

(c) Significance of Highway Drainage

(d) Uses of Benkelman Beam Test

(e) Modified classification of Road system in India.
