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

Total number of printed pages – 2

B. Tech

PCCI 4302

Fifth Semester (Back/Special) Examination – 2013

TRANSPORTATION ENGINNERING - I

BRANCH : CIVIL

QUESTION CODE : D258

Full Marks – 70

Time : 3 Hours

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

1. Answer the following questions : 2×10

   (a) How the urban roads are classified in India ?

   (b) What are the disadvantages of an improper alignment of a new road ?

   (c) What are the objects of reconnaissance in engineering surveys ?

   (d) List the various geometric elements to be considered in highway design.

   (e) Define camber and what are its objectives?

   (f) Draw a typical cross section of a two lane National Highway in embankment.

   (g) Explain Traffic capacity.

   (h) What is the importance of Los Angeles Abrasion Test ?

   (i) What do you mean by CBR ?

   (j) What are the general causes of pavement failures ?

2. (a) Briefly outline the main features of various road patterns commonly in use. Explain with sketches the star and grid pattern. 5

   (b) Explain obligatory points. With sketches, discuss how these control the alignment. 5

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3. (a) Derive an equation for finding the super elevation required if the design coefficient of lateral friction is 'f'. 5

(b) The speed of overtaking and overtaken vehicles is 70 and 40 kmph, respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2, calculate the safe overtaking sight distance. (Assume data, if required as per IRC.) 5

4. What are the objects of providing transition curves on the horizontal alignment of highways ? Derive an expression for finding length of transition curve on horizontal alignment. The radius of a horizontal curve is 400 m, the total pavement width at curve is 7.6 m and the super elevation is 0.07. Design the transition curve length for a speed of 100 kmph. Assume pavement to be rotated about the inner edge. 10

5. (a) What are the different causes of traffic accidents ? Explain the various measures that may be taken to prevent accidents. 5

(b) What are the various types of failures in flexible pavements ? Explain the causes. 5

6. (a) What are the various factors to be considered in pavement design ? Discuss the significance of each. 5

(b) Explain the IRC recommendations for the CBR method of design of flexible pavements. 5

7. (a) Discuss the characteristics of an ideal bridge site. 5

(b) Describe different stages in the sinking of a well foundation for bridges stating the precaution you will take during sinking. 5

8. Write short notes on **four** of the following : 2.5 × 4

(a) Warping stresses

(b) Surface drainage

(c) Gradient

(d) Channelized Intersections

(e) Cutback Bitumen.