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Total number of printed pages – 3

B. Tech
PCCI 4302

Fifth Semester Back Examination – 2014

TRANSPORTATION ENGINEERING – I

BRANCH : CIVIL

QUESTION CODE : L 228

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 special cares to be taken while aligning hill roads ?
- (b) Draw a typical cross section of a divided highway in urban area.
- (c) State factors on which the overtaking sight distance depends.
- (d) Define camber and enumerate the objects of providing camber.
- (e) What is off-tracking ? Give sketches.
- (f) What is compensation in gradient on horizontal curves ?
- (g) Explain the term traffic volume.
- (h) What is bitumen emulsion ?
- (i) What do you mean by mud pumping ?
- (j) What are the general causes of pavement failures ?

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2. (a) Explain the role of pavement surface characteristics in highway geometric design. State the factors affecting friction between pavements and tyres of vehicles. 5
- (b) Calculate the extra width of pavement required on a horizontal curve of radius 700 m on a two lane highway, the design speed being 80 kmph. Assume wheel base $l = 6$ m. Assume all other data as per IRC. 5
3. (a) 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". 5
- (b) The speeds of overtaking and overtaken vehicles are 70 and 40 kmph respectively. If the acceleration of overtaking vehicle is 0.99 m/sec^2 , calculate the safe passing distance for two way traffic. 5
4. 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. What are the different causes of traffic accidents? Explain various measures to be taken to prevent accidents. 10
5. (a) Explain briefly the modified classification of road system in India as per the Third Twenty Year Road Development Plan, 1981 - 2001. 5
- (b) What are the various objectives of preliminary survey for highway alignment? Enumerate the details to be collected and the various steps in the conventional method. 5
6. (a) Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement. 5
- (b) What are the requirements of a good highway drainage system? 5

7. (a) Sketch a typical well foundation indicating clearly its components. Describe their functions. 5
- (b) Discuss briefly the available methods of estimating the flood discharge and the methods for determining the linear waterway for a bridge. 5
8. Write short notes on the following : 2×5
- (a) Principle and uses of Benkelman Beam test
- (b) Penetration test of Bitumen
- (c) Los Angeles Abrasion test
- (d) Passenger car unit (PCU)
- (e) Obligatory points.

