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**B.E / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS
MAY 2012**

**CIVIL ENGINEERING BRANCH
FIFTH SEMESTER – (REGULATION 2008)
CE 9305 – HIGHWAY ENGINEERING**

Time: 3 Hours

Max. Marks: 100

- Instructions:**
- 1. Answer All Questions**
 - 2. All Questions Carry Equal Marks**

PART – A (10 x 2 = 20 Marks)

1. What are the basic requirements of highway alignment?
2. Write any two modern methods of highway alignment.
3. Draw a typical cross section of an arterial road with Indian Roads Congress (IRC) standards.
4. What do you mean by the term 'Transition Curve'? Write its significance in horizontal alignment.
5. Differentiate between 'Flexible and Rigid Pavement'.
6. Draw the typical cross section of pavement components with its functional elements.
7. Differentiate between 'Tar and Bitumen'.
8. Write any two special consideration you will keep in mind while designing hilly roads.
9. Define 'Present Serviceability Index' and 'Pavement Roughness'.
10. What is meant by 'Pavement Evaluation'?

PART – B (16 x 5 = 80 Marks)

11. Write in brief the various engineering surveys to be conducted for highway alignment.
- 12.a. Explain briefly the history of road development in India in Post Independence period.

(Or)

12.b. A two lane pavement (7.0 m) on a National Highway in hilly terrain (snow bound) has a curve of radius 60m. The design speed is 40 K.P.H. Determine the length of transition curve and the total length of curve and tangent length if the deflection angle is 60° . Make suitable assumptions.

13.a. Calculate the safe driving speed on a curve with radius 200 m, the super-elevation being 0.07. Is the curve meeting the standards of Major District Roads in plan terrain? If the pavement width is 7m, how much should the pavement edges be raised or depressed about the crown if the super-elevation is provided by rotating about the centre-line?

{Or}

13.b. Write the various design practice to be followed for a flexible pavement with IRC standards.

14.a. Explain in detail the construction procedure to be followed as per IRC standard for high type of bituminous pavement construction.

{Or}

14.b. With neat sketches explain the types of surface drainage in highway pavement.

15.a. Write in brief the various pavement failures in rigid pavement with its preventive measures with neat diagrams.

{Or}

15.b. Write in detail the various types of joints in rigid pavements with its functional characteristics and IRC standards.