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Total No. of Printed Pages: [01]

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**B.Tech. Civil Engg. (Semester – 6<sup>th</sup>)**  
**TRANSPORTATION ENGINEERING-I**  
**Subject Code: BCIES1-603**  
**Paper ID: [18110741]**

**Time: 03 Hours**

**Maximum Marks: 60**

**Instruction for candidates:**

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

**Section – A**

**(2 marks each)**

Q1. Attempt the following:

- a. Give the designated numbers of NHs from Bathinda to Chandigarh and Amritsar.
- b. What is the use of PIEV theory in highway geometric design?
- c. Why extra-widening of carriageway is provided on horizontal circular curves.
- d. What should be done to prevent the landslides on hill roads?
- e. Which IRC codes are used for design of flexible and rigid pavements in India?
- f. What is Road Development Plan Vision: 2021.
- g. What is the minimum grade of cement concrete to be used for rigid pavements?
- h. Expand SUPERPAVE.
- i. Differentiate between regulatory and cautionary road signs.
- j. Comment on road accidents scenario in our country in the context of whole world.

**Section – B**

**(5 marks each)**

- Q2. How the mega national road projects NHDP and PMGSY have impacted the socio-economic and infrastructural development in our country.
- Q3. Describe the various factors affecting the stopping sight distance on roads. Calculate the safe SSD on a stretch of a two lane national highway with a 3% gradient. Take design speed of NH as 100 kmph.
- Q4. Name the various bituminous mixes used for laying binder course and surface course of flexible pavements. Explain the Marshall method used for designing these mixes.
- Q5. What is Intelligent Transport System (ITS). Describe briefly various user services of ITS.
- Q6. Describe various road user and vehicular characteristics that affect the highway design and traffic performance.

**Section – C**

**(10 marks each)**

- Q7. What is the necessity of providing superelevation on horizontal circular curves? Design the superelevation to be provided on a horizontal curve of radius 200 m, on a 2-lane wide carriageway for the design speed of 100 kmph. How this superelevation is attained practically in the field.
- Q8. Describe the desirable properties of stone aggregates and bituminous materials used in road construction. What is the significance of each test conducted on these materials to judge their suitability for use in road construction?
- Q9. Draw typical cross sections of a flexible pavement and a rigid pavement and describe the function of each course and coat used to construct these pavements. How do these two types of pavements compare with each other?