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**Question Paper Code : X20306**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
Fifth Semester  
Civil Engineering  
CE 6504 – HIGHWAY ENGINEERING  
(Regulations 2013)  
(Common to PTCE 6504 – Highway Engineering for B.E. (Part-Time) –  
Civil Engineering – Third Semester – Regulation 2014)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

**(10×2=20 Marks)**

1. List the different modes of Transportation and their respective limitations.
2. List four parameters enumerated in Traffic Surveys for the Alignment and Design of Highways.
3. What are the elements involved in Highway Geometric Design ?
4. What is meant by extra widening at curves ?
5. What are the types of Rigid Pavements ?
6. Differentiate tack coat and prime coat.
7. What is the significance of CBR test ?
8. Define elongation index.
9. Define the term 'Pavement Serviceability Index' with its importance.
10. What is meant by the term 'Highway Project Formulation' ?

PART – B

**(5×13=65 Marks)**

11. a) What are the various classifications of roads ?

(OR)

- b) Explain in detail the reconnaissance survey for highway location in rural area.



12. a) i) Calculate the Super-elevation to be provided for a horizontal curve with a radius of 400 m for a design speed 100 kmph in plain terrain. If super-elevation is restricted to 0.07, calculate the coefficient of lateral friction mobilised. (7)
- ii) Calculate the Safe Stopping Distance while travelling at a speed of 100 kmph on a level road. Assume all other data as required. (3)
- iii) Draw the various components of Overtaking Sight Distance on a straight stretch of a highway and explain each zone. (3)

(OR)

- b) i) List and draw the various Vertical Curves adopted in Highways. (5)
- ii) Explain the controls and guidelines for safe, comfortable travel in Highway Vertical Curves. (4)
- iii) List the various technical guidelines recommended for safety and comfort in case of Horizontal Curves in highways. (4)
13. a) Explain in brief various design principles to be adopted in flexible pavement design.

(OR)

- b) Explain in detail the various design practices normally adopted in rigid pavement design as per IRC standards.
14. a) What are the different forms of bitumen ?

(OR)

- b) Explain the California Bearing Ratio Test.
15. a) Explain in detail the possible causes and remedial measures for joint failure.

(OR)

- b) Explain the possible causes and remedial measures for joint spalling.

PART – C

(1×15=15 Marks)

16. a) Describe any four laboratory tests on Aggregates.

(OR)

- b) i) Describe the construction procedure of a flexible pavement. Explain the equipment required for various layers while constructing the flexible pavement. (8)
- ii) Describe the CBR test procedure in lab. (7)