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**Question Paper Code : 91307**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019  
Fifth Semester  
Civil Engineering  
CE 6504 – HIGHWAY ENGINEERING  
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Specific chart may be issued.  
Answer ALL questions.

**PART – A**

**(10×2=20 Marks)**

1. Write short notes on Highway Research Board.
2. Write the functions of Indian Road Congress.
3. Differentiate between Right of Way and Carriage Way.
4. Draw a typical Transition Curve and mark all its zones.
5. What are the requirements of an ideal pavement ?
6. What is Equivalent single wheel load ?
7. Differentiate between 'Geo-Textiles and Geo-Membrane' in highway construction.
8. Write short note on Highway Drainage.
9. List any 4 types of failures observed in flexible pavement.
10. What are the causes of cracks in Pavement ?

**PART – B**

**(5×13=65 Marks)**

11. a) i) List out all the types of Highways as classified in the Indian Context starting from the Expressways upto Village/Rural Roads ; for each type, briefly state its specifications.  
ii) List the effects on Environment and Ecology of the Surroundings due to a highway project.  
(OR)
- b) Illustrate with neat sketches and explain, how obligatory points control a highway alignment.



12. a) Explain the types of gradient.

(OR)

b) A road has a total width of 7.5 m including extra widening on curve and design speed of 65 kmph. Calculate the length of transition curve and its shift on this curve of 200 m radius. Allowable super elevation is 1 in 150 and pavement is rotated about center line.

13. a) Design the pavement for construction of a new bypass with the following data :

1) Two lane carriage way.

2) Initial traffic in the year of completion of construction = 400 CVPD (sum of both directions)

3) Traffic growth rate = 7.5%

4) Design life = 15 years.

5) Vehicle damage factor based on axle load survey = 2.5 standard axle per commercial vehicle.

6) Design CBR of subgrade soil = 4%

(OR)

b) Explain in sequence the steps followed in design of cement concrete pavement.

14. a) Discuss the following test procedures for testing the quality of aggregate and Bitumen.

i) Aggregate Impact Test.

ii) Softening Point Test.

(OR)

b) Discuss the construction practice adopted for flexible pavement.

15. a) Explain in detail the possible causes and remedial measures of Rigid Pavement failure.

(OR)

b) Explain the methods employed for evaluation of pavements and explain the evaluation of pavement by Benkelman Beam method and deflection measurements.

PART - C

(1×15=15 Marks).

16. a) Explain the process of engineering survey for a highway alignment through conventional method.

(OR)

b) i) Explain PIEV Theory with neat sketch.

ii) Compare two modes of Transportation - Railways and Highways.