

D. Sauri Sharma

Roll no.:.....

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12

171

National Institute of Technology, Hamirpur (HP)

End Semester Exam – B Tech

Branch: Civil Engineering
Course Name: Highway Engineering
Time: 3 Hours

Semester: 5th
Course Code: CE-314
Maximum Marks: 50

1. Design the super-elevation on a horizontal curve of radius 200 m for a design speed of 90 kmph.
2. Find the extra-widening on a single lane carriageway with a design speed of 70 kmph on a horizontal curve of radius 120 m. Assume that the wheel base of the longest vehicle on the road is 6 m long
3. A vertical curve is formed when an ascending gradient of 6% meets another ascending gradient of 3%. Find the length of the curve to provide the required stopping sight distance for a design speed of 60 kmph ($t = 2s$, $f = 0.35$, $H = 1.2m$, $h = 0.15m$)
4. The average normal flow of traffic on cross roads A and B during design period are 400 and 200 PCU per hour. The saturation flow values on these roads are estimated to be 1200 and 1000 PCU per hour respectively. Design two phase traffic signal by Webster's method.
5. Estimate the total number of standard axle load repetitions during the 20 years design life of a pavement with present day traffic of 200 commercial vehicles per day (CVPD), rate of growth of traffic as 6%, vehicle damage factor (VDF) as 2.0 and lane distribution factor (LDF) as 0.5.
6. Discuss the material specifications and specific applications of any two bituminous mixes used in a flexible pavement.
7. Draw any 2 road markings and any 3 traffic signs.
8. Draw a neat cross section of a cloverleaf interchange
9. With the help of diagrams, discuss the causes and remedies of any two flexible pavement defects
10. List down various equipment and their utility in highway construction projects

Each question carries 5 marks