

Roll No.

3202

**B. Tech (Civil Engg.) 5th Semester
Examination – February, 2022
HIGHWAY ENGINEERING-I**

Paper : PCC-CE-303G

Time : Three hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after commencement.

Note : Attempt five questions in all, selecting one from each section. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) Define elongation index.
- (b) Differentiate pumping and raveling.
- (c) Define equivalent radius of resting section.
- (d) What are the fundamental principal of alignment ?
- (e) What are the difference forms of bitumen ?
- (f) What are the possible causes for longitudinal cracking ?

SECTION – A

2. (a) Write in brief the history of road development in India after independence.

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- (b) Explain in detail the reconnaissance survey for highway location in rural area.
3. (a) What are the uses of map study in engineering survey for location ?
- (b) Explain briefly the various stages of work in a new highway project.

SECTION - B

4. The speed of overtaking and overtaken vehicles is 80 and 50 kmph respectively. On a two-way traffic road, the acceleration of overtaking vehicles is 0.99 m/sec^2 . Calculate OSD, mention the minimum length of overtaking zone and draw the sketches zone with all details.
5. Explain briefly :
- (a) Why should the psychological widening be added to the mechanical widening ?
- (b) How is the widening of pavement introduced in the field ?
- (c) What is off-tracking ? Explain with sketches.
- (d) Determine the off-tracking of a vehicle with wheel base 7.0 m while negotiating a horizontal curve of radius 100 m.

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SECTION - C

6. Discuss the construction practice with modern materials and methods to be adopted for a high type of bituminous pavements as per IRC standard.
7. (a) Explain the different engineering properties of aggregate and suitable tests required to check those properties.
- (b) Discuss various factors affecting on subgrade soil strength.

SECTION - D

8. (a) Explain the various types of traffic signals and their functions. How are the signals timing decided ?
- (b) Explain the level of service concepts while deciding the design capacity of a road.
9. Explain in detail :
- (a) Geographic Information System
- (b) Automatic Vehicle Identification
- (c) Video Data Collection

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