

- (b) Write short note on 'waste plastic in bituminous mixes'. 7

SECTION - D

8. (a) Classify the different types of traffic signs and mention the objective of each type of sign with neat sketches. 8
- (b) What are the different techniques used in an intelligent transportation system? Describe in detail. 7
9. Write short notes on the following related to intelligent transportation systems: 15
- (i) Parking space inventory survey
 - (ii) OD studies with its significance
 - (iii) Methods of counting traffic volume
 - (iv) Objectives of intelligent transportation systems

Roll No.

3202

**B. Tech. 5th Semester (Civil Engg.)
Examination – March, 2021**

HIGHWAY ENGINEERING-I

Paper : PCC-CE-303-G

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 examination.

Note : Question No. 1 is compulsory. Attempt one question from each Section. All questions carry equal marks. Assume missing data, if any, suitably.

1. Describe the following : 2.5 × 6 = 15
- (a) Classification of highways
 - (b) Right of way and camber
 - (c) Fundamental principles of alignment
 - (d) Subgrade soil and its function
 - (e) PLEV theory
 - (f) Methods of maintaining accident records

SECTION - A

2. (a) What is the scope of highway engineering ?
Explain different road development plans in India. 8
- (b) Briefly explain different highway projects including PMGSY. 7
3. (a) What is the necessity of highway planning ?
Explain in brief the modern methods of laying highway alignment being adopted at present with its merits and demerits. 8
- (b) Briefly describe the factors affecting highway alignment. 7

SECTION - B

4. (a) What is head on collision ? Calculate the minimum sight distance required to avoid a head on collision of two cars approaching from the opposite directions at 90 and 60 kmph. Assume a reaction time of 2.5 seconds, coefficient friction 0.7 and brake efficiency of 50% in either case. 8

3202- (P-4)(Q-9)(21) (2)

- (b) Briefly explain traffic separators and traffic barriers. 7

5. (a) The radius of horizontal circular curve is 100 m. The design speed is 50 kmph and the design coefficient of lateral friction is 0.15. (i) Calculate the super elevation required if full lateral friction is assumed to developed (ii) Calculate the coefficient of friction needed if no super elevation is provided. 8
- (b) What is the necessity of road widening on horizontal curves ? Explain the factors on which the design of widening depends. 7

SECTION - C

6. (a) What are the different tests on aggregates ? Describe any *two* in detail. 8
- (b) Describe in detail the evaluation of soil strength by different tests. 7
7. (a) Explain in detail the requirements specifications of materials and the construction methods for bituminous concrete layer. 8

3202- (P-4)(Q-9)(21) (3) P. T. O.