May 2024
B.Tech. (Civil) 4th Semester
Highway Engineering (PCC-CED-206)

Time : 3 Hours]   [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*

2. *Answer any four questions from Part-B in detail.*

3. *Different sub-parts of a question are to be attempted adjacent to each other.*

4. *Assume any missing data accordingly.*

PART–A

1. (a) Outline the classification based on location and function as suggested in the Nagpur road plan.   (1.5)

    (b) Define obligatory points in highway alignment. (1.5)

    (c) Determine the equivalent Wheel Load Factor value of two axle load for LCV with rear axle load of 2.01t in terms of standard axle load of 10.0 t.   (1.5)

    (d) Design ESWL.   (1.5)

    (e) State factors on which overtaking sight distance depends.   (1.5)

    (f) Define right of way.   (1.5)

(g) Explain the term traffic volume. (1.5)

(h) What are the advantage and disadvantages of traffic signals? (1.5)

(i) List various types of joints used in concrete pavement construction. (1.5)

(j) Define mud pumping in concrete pavements. (1.5)

PART–B

2. (a) What are the various requirements of an Ideal highway alignment? Discuss briefly. (9)

(b) Write short notes on : (6)
   (i) PMGSY.
   (ii) Indian Road Congress.

3. (a) Calculate the stopping sight distance for a design speed of 100 kmph. Assume suitable data accordingly. (10)

(b) Explain total reaction time of driver and the factors on which it depends. (5)

4. (a) Indicate how the traffic volume data are presented and the results interpreted for the use in traffic engineering design. (9)

(b) What are the various types of parking facilities designed for traffic needs? Compare kerb parking with off-street parking. (6)

5. (a) Explain the desirable properties of aggregates to be used in different types of pavement construction. (9)

(b) Explain the uses of bitumen emulsion. How are they prepared? (6)

6. (a) What are the factors to be considered for the design of flexible pavements? Discuss significance of each. (10)

(b) What is the effect of using superior pavement materials in flexible pavement? Explain. (5)

7. (a) What are the objectives of providing dowel bars in CC pavements? Explain. (7)

(b) A cement concrete pavement has a thickness of 22 cm and has two lanes of 7.2 m with a longitudinal joint along the centre. Design the dimension and spacing of tie bar using the following details.

Allowable working stress in tension = 1400 kg/cm^2

Unit weight of concrete = 2400 kg/m^3

Coefficient of friction = 1.5

Allowable bending stress in deformed bars in concrete = 2.5 kg/cm^2. (8)

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