Total No. of printed pages = 5

END SEMESTER EXAMINATION, NOVEMBER-2018

Semester : 5th

Subject Code : CT-505

TRANSPORTATION ENGINEERING

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

1. *All* questions of PART – A are compulsory.
2. Answer any *three* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : $1 \times 10 = 10$

   (a) A median is also called as _____.

   (b) The desirable relationship between OSD and length of overtaking zone is _____.

   (c) The difference in between the set of front axle and rear axle while negotiating a horizontal curve is called _____.

[Turn over

(d) The Motor Vehicle Act was revised in _____.

(e) Raising of outer edge of a road with respect to inner edge, is known as _____.

(f) Maximum wheel base distance provided on Indian B.G. tracks, is _____.

(g) The method of design of flexible pavement as recommended by IRC is _____.

(h) The minimum thickness of compacted sub grade is _____.

(i) The CBR standard penetration is _____.

(j) The ruling gradient required for plain or rolling terrain is _____.

2. Write true or false : 1×10=10

(a) Second twenty year road development plan is known as Nagpur Road Plan.

(b) Jayakar Committee was formed in the year 1929.

(c) The width of carriage way for a multi-lane pavement is 3.5m per lane.

(d) Kerb is also called the traffic separator.

(e) Ruling gradient is the minimum gradient provided on a curve.

(f) Ballast is a part of permanent way in a railway track.

(g) CBR test was carried out to design rigid pavement.

(h) Aggregate impact test is carried out to calculate the hardness of aggregate.

(i) Abrasion test is carried out to determine the toughness property of aggregate.

(j) The overtaking sight distance is more than the stopping sight distance.

3. Choose the correct answer : 1×5=5

(a) The resisting length

(i) should be kept minimum

(ii) should be kept maximum

(iii) depends on the gradient

(iv) depends on the rise and fall

(b) The minimum factor of safety for rigid pavement is

(i) 1 (ii) 1.1

(iii) 1.5 (iv) 1.7

(c) Design of flexible pavements is based on

(i) Empirical formula

(ii) Mathematical analysis

(iii) Combination of empirical and mathematical analysis

(iv) None of these

(d) Thickness of a pavement may be reduced considerably by

(i) compaction of soil

(ii) drainage of soil

(iii) stabilisation of soil

(iv) combination for all

(e) If the ruling gradient on any highway is 3%, the gradient provided on the curve of 300 metre radius, is

(i) 2·0% (ii) 2·25%

(iii) 2·5% (iv) 2·75%

PART – B

Marks – 45

4. (a) What is the difference between flexible and rigid pavement ? 5

(b) Explain the CBR method for determining the thickness of pavement layers. 10

5. (a) What is conning of wheel ? 5

(b) Derive the expression for super elevation or cant for a railway track. Explain cant deficiency and cant excess of railway track. 10

6. (a) What is overtaking sight distance ? 5

(b) Derive the expression for overtaking sight distance in a highway. 10

7. (a) Calculate the stopping sight distance on a highway at a descending gradient of 2% for a design speed of 80 km/h. Assume $t = 2.5$ sec and design coefficient of friction as 0.35. Determine the expression for super elevation and radius of curve. 5

(b) What are the different components of a permanent way or a railway track ? State the functions of each of the components ? 10