Total No. of printed pages = 5

END SEMESTER EXAMINATION – 2019

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.

1. Questions on PART–A are compulsory.
2. Answer any *three* questions from PART–B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10

   (a) Jayakar Committee was made in the year ——.

   (b) The meeting of first 20 years road development plan was held in the place ———.

   (c) The golden quadrilateral was formed by connecting ——— cities.

[Turn over

(d) The position or layout of the centre line of the highway is called ———.

(e) Camber in the road is provided for ———.

(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 value of CBR in CBR test is calculated at ——— mm penetration.

(i) The maximum allowable Los angeles abrasion value for high quality surface course is ———.

(j) Aggregate impact test is used to measure ——— value of aggregates.

2. Write true or false : 1×10=10

(a) The shape of camber best suited for cement concrete pavement is elliptical.

(b) Third twenty year road development plan is also known as Bombay road plan.

(c) Shoulder in highway is provided to increase the drainage of rain water.

(d) Reaction time of a driver increases with the decrease in speed of the vehicle.

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

(f) Sleepers are part of permanent way in a railway track.

(g) CBR test was required to determine the thickness of pavement.

(h) Cant is provided in highway to regulate the traffic flow.

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

(j) The gague distance in Indian B.G. track is 2.1 m.

3. Choose the correct answer : 1×5=5

(a) If ruling gradient is 1 in 20 and there is also a horizontal curve of radius 76m, then the compensated grade should be

(i) 3% (ii) 4%

(iii) 5% (iv) 6%

(b) The value of ruling gradient in plains as per IRC recommendation is

(i) 1 in 12 (ii) 1 in 15

(iii) 1 in 20 (iv) 1 in 30

(c) Rapid curing cutback bitumen is produced by blending bitumen with

(i) kerosine (ii) benzene

(iii) diesel (iv) petrol

(d) Creep is the

(i) longitudinal movement of rail

(ii) lateral movement of rail

(iii) vertical movement of rail

(iv) difference in level of two rails

(e) The transition curve used in the horizontal alignment of highways as per IRC recommendations is

(i) Spiral (ii) Cubic parabola

(iii) Lemniscate (iv) Any of these.

PART – B

Marks – 45

4. What is permanent way ? Explain with suitable figure different components of a permanent way. 5+10=15

5. What is the difference between SSD and OSD ? Derive the expression for OSD in a highway. 5+10=15

6. Derive the expression for super elevation or cant for a railway track. Explain cant deficiency and cant excess of railway track. What is conning of wheel ? 5+5+5=15

7. The speed of an overtaking and overtaken vehicle are 70 and 40 km/h respectively on a two way traffic road. If the acceleration of the overtaking vehicle is 0.99 m/sec^2,

(a) calculate the minimum and desirable length of overtaking zone.

(b) draw the neat skech of the overtaking zones and show the position of the sign post. 8+7=15