53 (CE 502) TREN-I

2017

TRANSPORTATION ENGG–I

Paper : CE 502

Full Marks : 100

Time : Three hours

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

Answer ***all*** *questions.*

1. *(a)* Write the history of road development. 5

(b) Draw different types of road patterns. 5

(c) Explain the factors controlling highway alignment. 10

2. *(a)* Explain Aggregate Impact test. 5

(b) Explain Aggregate crushing value test. 5

(c) Explain the factors affecting SSD. 5

(d) Design the rate of superelevation for a horizontal highway curve of radius 500*m* and speed 100*kmph*. 5

3. (a) What are the purposes of providing extra widening on horizontal curves? Also explain the method of providing extra widening. 10

(b) Calculate the length of transition curve using following data

Design speed = 65*kmph*

Radius of circular curve=220*m*

Pavement width including extra widening = 7·5*m*

Allowable rate of introduction of superelevation (pavement rotated about centre line) = 1 in 150.

10

4. *(a)* A state highway passing through a rolling terrain has a horizontal curve of radius equal to rolling radius. Design all the geometric features of the horizontal curve assuming suitable data.

Calculate set back distance for ISD. assuming Length of curve > ISD. 10

(b) A vehicle travelling at 40*kmph* was stopped 1·8 seconds after the application of brakes. Determine skid resistance of pavement. 5

(c) Speed of Four vehicles on a road are 20*kmph*, 35*kmph*, 40*kmph* and 45*kmph*. Calculate the time mean speed and space mean speed. Length of section is 300*km*. 5

5. *(a)* Define Camber. What are the purposes of providing it ? Why too steep camber is not recommended ? 10

(b) Explain Flakiness and Elongation index test. 10
