

**SECTION - D**

8. (a) Calculate the cant deficiency and permissible speed for a 4° curve on a B.G. track. 10  
(b) What are the objects of providing transition curves on railways? 10
9. (a) Write a short note on lining of tunnels. 10  
(b) Write a short note on classification of tunnels. 10

Roll No. ....

**24288**

**B. Tech. 5th Semester (Civil Engg.)  
Examination – December, 2016**

**TRANSPORTATION ENGG. - I**

Paper : CE-303-F

Time : Three Hours ]

[ Maximum Marks : 100

*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 :** Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) What do you mean by carriage way? 4  
(b) Define super-elevation. Explain with neat sketches types of super-elevation. 4  
(c) What are the causes of road accidents? 4  
(d) What are IRC specifications for suitability of aggregates? 4



(c) Write a short note on fixure and fastening. 4

### SECTION - A

2. (a) What do you mean by highway alignment ? Explain factors affecting alignment. 10

(b) Explain why the saturation system is considered a rational method to decide the final road network and for road development programme. 10

3. (a) An ascending gradient of 1 in 100 meets a descending gradient of 1 in 120. A summit curve is to be designed for a speed of 80 km/hr and overtaking sight distance of 470 m. 12

(b) Write a short note on sight distance at intersection. 8

### SECTION - B

4. (a) Explain the factors on which the length of valley curve is designed. 10

24288-4850-(P-4)(Q-9)(16) (2)

(b) Calculate the length of transition curve for a design speed of 80 km/hr at horizontal curve of radius 300 m in rural area. 10

5. Discuss the various traffic studies and their importance. 20

### SECTION - C

6. (a) Explain Marshall method of mix design. 10

(b) Write a short note on modified bitumen that can be used in bituminous mixes. 10

7. Find out the steepest gradient on a straight track for a train having 20 wagons :

Weight of each wagon = 18 tonnes

Rolling resistance of each wagon = 2.5 kg/tonne

Speed of train = 60 kmph

Locomotive Specification :

Weight = 120 tonnes

Tractive effort = 12 tonnes

Rolling resistance = 3.5 kg/tonne

20

24288-4850-(P-4)(Q-9)(16) (3)

P. T. O.