

7E4035

Roll No. : \_\_\_\_\_

Total Printed Pages : 4

7E4035

B. Tech. (Sem. VII) (Main/ Back) Examination December- 2012  
 Ceramic Engg.  
 7CE5 Transportation Engineering II

Time : 3 Hours]

[Maximum Marks : 80

[Min. Passing Marks : 24

*Attempt any five questions. Selecting one question from each unit.  
 All questions carry equal marks. Schematic diagrams must be  
 shown wherever necessary. Any data you feel missing suitably be  
 assumed and stated clearly. Units & quantities used/calculated  
 must be stated clearly.*

Use of following supporting material is permitted during examination.  
 (Mentioned in form No. 205)

1. NIL 2. NIL

## UNIT I

- 1 (a) Describe the different types of rail joints used on railway track. 6
- (b) Enumerate various rail gauges used in different parts of the world. Why it is desirable to have a uniform gauge for the whole railway network of country. 10

OR

- (a) A B.G. track has a sleeper density on (M+6). If the track is laid with welded rails of 26 metre length, find out the number of sleepers on rail length. 6
- (b) Differentiate between the following: 10
- (i) Suspended joint and supported joint
  - (ii) Square joint and staggered joint
  - (iii) Reinforced concrete sleepers and pre-stressed concrete sleepers
  - (iv) C.S.T.-9 sleeper and Rail free duplex sleeper
  - (v) Sleeper spacing and sleeper density.

7E4035]



1

[Contd...

## UNIT - II

- 2 (a) Explain with a neat sketch : A left hand turnout. 6
- (b) Discuss the objectives of urban transport . Explain the major issues relating to the development of the Metropolitan transport system. 10

OR

- (a) How do you differentiate between "underground railway" and "tube railways"? Mention the advantages of using underground railways for mass transportation in a metropolitan city. 8
- (b) On a straight B.G. track, a turnout takes off at an angle of  $6^{\circ}42'35''$ . Design the turnout when it is given :
- (i) Angle of switch i.e.  $\beta = 1^{\circ}34'27''$ .
- (ii) Heel divergence = 13.65 cm.
- (iii) length of straight arm at crossing, i.e.,  $x = 83$  cm. 8

## UNIT - III

- 3 (a) How do you define the superelevation? What are the objects of providing superelevation on curves of a railway track? 6
- (b) A  $5^{\circ}$  curve diverges from a  $3^{\circ}$  main curve in reverse direction in the layout of a B.G. yard. If the branch line is restricted to 35 km.p.h., determine the restricted speed on the main line. 10

OR

- (a) Write short notes on :
- (i) Widening of gauge on curves
- (ii) Transition curves
- (iii) Sketch to explain 'shift'

6



(b) On a transitioned curve on B.G. track, the speed by railway board's speed formula :  $V_s = 4.35 \sqrt{R} - 67$  is 1.25 times the maximum permissible speed obtained by the cant formula, after allowing the cant deficiency of 7.6 cm. If the actual cant provided is the equilibrium cant for an average speed of 60 km.p.h.

Calculate

- (i) the radius in metres
- (ii) maximum speed ( $V_{max}$ ) and
- (iii) the cant to be actually provided.

10

UNIT - IV

4 (a) What are the factors that influence the location of airport? 6

(b) Calculate the actual length of the runway for the following data.

- Airport elevation : R.L 110
- Airport reference temperature : 30°C
- Basic length of runway : 630 m
- Highest point along the length : R.L. 108.4
- Lowest point along the length : R.L. 106.0

10

OR

(a) What are the various factors affecting the necessary size of an airport? 6

(b) Write short note on:

- (i) Runway patterns
- (ii) Apron and hanger
- (iii) Turnaround taxiways
- (iv) Obstructions
- (v) Zoning laws

10



## UNIT - V

5 (a) What are the design factors to be considered in determining pavement thickness ?

6

(b) Describe in detail some of the typical flexible pavement failure with sketch.

10

OR

(a) Describe the CBR method of designing the flexible pavements.

6

(b) Discuss in brief recognized methods of designing the rigid pavements. What are the main factors responsible for failures in rigid pavements ?

10

