Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/CE/SEM-7/CE-702/2012-13

2012

TRANSPORTATION ENGINEERING-II

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) Gauge is the distance between

a) c/c of rails b) running face of rails

c) outer face of rails d) none of these.

ii) The fixture used to join rails is

a) Fish plate b) Bearing plate

c) Spikes d) Keys.

iii) Cant deficiency occurs when a vehicle travels around a curve at

a) equilibrium speed

b) speed higher than equilibrium speed

c) speed lower than equilibrium speed

d) all of these.

iv) The grade compensation of a 4° curve on B.G. track is

a) 0·20% b) 0·16%

c) 0·12% d) 0·08%.

v) For an M.G. route with $M + 7$ sleeper density, number of sleepers per rail length is

a) 18 b) 19

c) 20 d) 21.

vi) Semaphore signal is type of

a) Stop signal b) Departure signal

c) Control signal d) Reception signal.

vii) Estuary Harbour is situated by the side of

a) Sea b) Lake

c) Canal d) River.

viii) The chief function of a dry dock in a harbour is to enable

a) storage of goods

b) check goods by customs

c) handling of goods

d) repair of ships.

ix) An enclosed area for berthing ships, to keep them afloat at a uniform level to facilitate loading and unloading cargo is known as

a) harbour b) port

c) dock d) lock.

x) As per ICAO, the minimum basic runway lengths for *A* and *E* type airports will be

a) 1500 m and 600 m

b) 2100 m and 750 m

c) 1500 m and 750 m

d) 2100 m and 600 m.

xi) As per ICAO, for airports serving big aircrafts, the cross-wind component should not exceed

a) 15 kmph b) 25 kmph

c) 35 kmph d) 45 kmph.

xii) Which of the following is used for serving and repairs of the aircraft ?

a) Apron b) Hangar

c) Terminal building d) Holding apron.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Draw typical cross-section of a permanent way. Discuss in brief the basic functions of various components of a railway track.

3. What is creep ? Describe how you will measure creep.

4. What are the requirements of a good harbour ?

5. Define runway and taxiway. Give neat sketch of a single runway airport.

6. What would be the gradient of a BG track when the grade resistance together with track resistance due to a curve of 3 degrees shall be equal to for a ruling gradient of 1 in 200 ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is break-water ? What are the factors required for break-water selection ?

   b) Explain spring tide and neap tide.

   c) What are quays ? 5 + 7 + 3

8. a) Define negative superelevation.

   b) On a BG track with 3 degree curve the equilibrium cant is provided for a speed of 70 kmph. Calculate the value of equilibrium cant and allowing a maximum cant deficiency what would be the maximum permissible speed on the track ?

   c) Classify railway stations.

   d) Write about the function of sleepers. 2 + 7 + 3 + 3

9. a) Discuss various tractive resistances.

   b) What do you mean by hauling capacity ?

   c) Calculate maximum permissible train load that can be pulled by a locomotive engine having 4 pairs of driving wheels each carrying an axle load of 24 tonnes each. The train runs at a speed of 80 kmph on a straight level BG track. Also determine the reduction in the speed if train climbs a gradient of 1 in 200. 5 + 2 + 8

10. a) Discuss the corrections that are applied on ICAO recommended length of runway for elevation and temperature.

    b) Find out the required runway length for the airport if the ICAO reference field length is 1800 m. The airport elevation is 450 m above mean sea level. The runway effective gradient is 0·5%. The monthly mean of maximum and mean daily temperature of the hottest month of the year are 27°C and 18°C respectively.

5 + 10

11. a) What is windrose diagram ? What are its types ? What is the difference between them ?

b) Given the following wind data, draw the windrose diagram and show the best runway orientation :

Wind direction	**Percentage of Winds**
N	3·6
NNE	2·8
NE	7·8
ENE	5·0
E	10·3
ESE	2·2
SE	5·6
SSE	2·9
S	8·2
SSW	5·7
SW	7·3
WSW	4·9
W	4·9
WNW	7·6
NW	7·7
NNW	4·1

Calm wind = 9·4%

Total = 100%. 5 + 10