Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(CE)/SEP.SUPPLE/SEM-7/CE-702/2012

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 : $10 \times 1 = 10$

i) Normally the limiting value of cant is

a) $\frac{G}{18}$ b) $\frac{G}{10}$

c) $\frac{G}{12}$ d) none of these,

where G is the gauge of railway track.

ii) The rail is designated by its

a) total length b) total weight

c) cross-sectional area d) weight per unit length.

iii) The choice of gauge depends upon

a) volume and nature of traffic

b) speed of train

c) physical features of the country

d) all of these.

iv) The joint generally not used on Indian railway is

a) supported joint b) suspended joint

c) compromise joint d) bridge joint.

v) The maximum limit of superelevation recommended by Indian Railways on broad gauge is

a) 76·2 mm b) 83·2 mm

c) 101·6 mm d) 165·1 mm.

vi) On Indian railways, cant deficiency allowed on broad gauge track is

a) 56 mm b) 66 mm

c) 76 mm d) 87 mm.

vii) In the cross-section of railway track, side slope in embankment is kept as

a) 1 : 1 b) 1 : 5

c) 2 : 1 d) 3 : 1.

viii) The limit for cant deficiency of Metre Gauge track is

a) 10 cm b) 7·6 cm

c) 5·1 cm d) 3·8 cm.

ix) Which of the following is used for servicing and repair of the aircraft ?

a) Apron b) Hanger

c) Terminal Building d) Holding Apron.

x) The cross-wind component for mixed aircraft (small & big) should not exceed

a) 25 kmph b) 15 kmph

c) 35 kmph d) 37 kmph.

xi) The runway of code *B* as per ICAO classification is made for aircrafts having wing span between

a) 15 m and 24 m b) 24 m and 36 m

c) 36 m and 52 m d) 52 m and 65 m.

xii) On M.G. Track the standard size of wooden sleeper used is

a) 152 cm × 15 cm × 10 cm

b) 2742 cm × 25 cm × 13 cm

c) 180 cm × 20 cm × 11·5 cm

d) none of these.

xiii) The significant wave height is defined as the average height of

a) one-third highest waves

b) one-fourth highest waves

c) one-sixth highest waves

d) one-eighth highest waves.

xiv) A ship is berthed in a chamber and lifted by principles of buoyancy. Such a chamber is called

a) dry dock b) wet dock

c) floating dock d) refuge dock.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Draw the typical cross-section of a B.G. track for double line on straight track with proper dimensions.

3. a) Explain coning of wheels with neat diagram.

b) What are the different types of rails ? 3 + 2

4. Describe with diagrams different types of rail failures.

5. Write short notes on any two of the following : $2 \times 2\frac{1}{2}$

   a) Prestressed concrete sleepers

   b) Spring tides

   c) Semaphore signal.

6. a) Define a harbour.

   b) Name the types of harbour as per different classifications.

   c) What is the difference between a harbour and a port ?

   1 + 2 + 2

7. What are the advantages and disadvantages of Pre-stressed concrete sleepers ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) Discuss different theories of rail creep.

   b) Explain how creep can be measured.

   c) What is corrugation in rails ? Suggest remedial measure for corrugation. 6 + 4 + 5

9. a) Discuss the various tractive resistances.

   b) What do you mean by Hauling capacity of a locomotive ?

c) Calculate maximum permissible train load that can be pulled by a locomotive having four-pair of driving wheels carrying an axle load of 24 tonnes each. The train has to run at a speed of 80 km/hr on a straight level track (B.G.). Also calculate the reduction in speed if train has to climb a gradient of 1 in 200. 8 + 2 + 5

10. a) What are the requirements of good harbour ?

b) Explain the terms 'littoral drift' and 'neap tide'.

c) Write a short note on Tetrapods.

d) Differentiate between dry docks and wet docks.

e) What is a light house ? 3 + 4 + 3 + 3 + 2

11. a) i) Define breakwater.

ii) Mention its classification.

b) i) Explain the forces acting on breakwater.

ii) Draw the force diagram.

c) What are the controlling factors for selection of type of breakwater ?

d) Draw a section of a Rubble Mound Breakwater showing its Core, Fitter and Armour Layers.

1 + 2 + 2 + 2 + 3 + 3 + 2

12. a) Find out the number of sleepers required for 640 m length of track when sleeper density is $M + 5$.

b) Compare the merits and demerits of metal sleeper and RCC sleeper.

c) What is rail corrugation ? Mention the remedial measures of this defect.

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