Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech (CE)/SEM-7/CE-702/2011-12
2011
TRANSPORTATION ENGINEERING – II

Time Allotted : 3 Hours   *Full Marks :* 70

The figures in the margin indicate full marks.

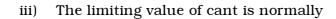*Candidates are required to give their answers in their own words as far as practicable.*

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

    i)   The main function of a fish plate is

         a)   to join the two rails together

         b)   to join rail with the sleeper

         c)   to allow rail to expand and contract freely

         d)   none of these.

    ii) Gauge is the distance between

         a)   centre to centre of rails

         b)   running face of rails

         c)   outer face of rails

         d)   none of these.

iii)　The limiting value of cant is normally

  a)　G/8   b)　G/10

  c)　G/12   d)　G/15.

iv)　Grade compensation per degree of curve of Broad Gauge

  track is

  a)　0·04%   b)　0·03%
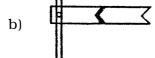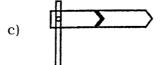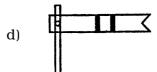
  c)　0·02%   d)　0·05%.

v)　Which one of the following figures represents a 'Warner
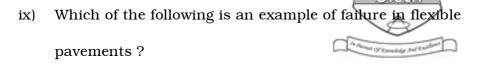
  signal' in railways ?

a)

b)

c)

d)

vi) Consider the following surveys :

I.   Reconnaissance survey

II.   Preliminary survey

III. Traffic survey

IV.   Location survey.

The correct sequence in which these surveys are conducted before the alignment of a track is finalized is

a) I, III, II, IV   b) I, III, IV, II

c) III, I, IV, II   d) III, I, II, IV.

vii) Vizag is an example of

a) Natural harbour   b) Semi-natural harbour

c) Artificial harbour   d) None of these.

viii) Zero fuel weight of an aircraft is

a) equal to empty operating weight

b) equal to maximum landing weight

c) less than empty operating weight

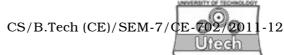d) equal to sum of empty operating weight and the maximum pay load.

    ix)   Which of the following is an example of failure in flexible pavements ?

        a)   Alligator cracking

        b)   Mud pumping

        c)   Warping cracks

        d)   Shrinkage cracks.

    x)   The rail is designated by its

        a)   Length   b)   Cross-section

        c)   Weight   d)   Weight per unit length.

    xi)   The relation between the radius of curvature (R) and its degree of curvature (D) is given by

        a) $R = 1750/D$ b) $R = 1580/D$

        c) $R = 1786 \cdot 5/D$ d) $R = 1850/D$.

    xii)   As per ICAO, the minimum basic runway length for A and E type airport 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.

GROUP – B

(Short Answer Type Questions)

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

2. a) What do you mean by permanent way ?

    b) What would be the gradient for a B.G. track when the grade resistance together with the curve resistance due to a curve of 3 degree shall be equal to that for a ruling gradient of 1 in 200 ?

3. What are the requirements of a good harbour ?

4. Explain the term 'littoral drift' and 'neap tide'.

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

6. What is creep ? Briefly describe the procedure of measurement of creep.

7. What is the requirement of rails ?

GROUP – C

(Long Answer Type Questions)

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

8. a) Explain briefly with diagrams about the classification of harbours.   11

    b) Explain the term tidal current and its uses.   4

9. a) What is break water ? What are the factors required for selection of break water ? 5

   b) Explain briefly the terms Spring tide and Neap tide. 7

   c) What is Quays ? 3

10. a) Discuss the corrections applied an ICAO recommended length of runway for elevation, temperature and gradient.

    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) Calculate the maximum permissible train load that can be pulled by a locomotive having four pairs of driving wheels carrying an axle load of 24t each. The train has to run at a speed of 80 kmph on a straight level track (B.G.)

    b) Also calculate the reduction in speed if the train has to climb a gradient of 1 in 200.

    c) If the train climbs the gradient with a curve of 2°, what would be the reduction in speed ? 7 + 4 + 4

12. a) Define negative superelevation.

   b) On a BG 3 degree curve the Equilibrium Cant is provided for a speed of 70 kmph.

      i) Calculate the value of equilibrium cant.

      ii) Allowing a max cant deficiency, what would be the max permissible speed on the track ?

   c) Classify the type of railway stations.

   d) Write short notes on

      i) Semaphore signal

      ii) Shunting signal.

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