



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (CE)/SEM-7/CE-702/2009-10

2009

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) Ordinary rails are made of

- | | |
|-----------------|----------------------|
| a) mild steel | b) cast iron |
| c) wrought iron | d) high carbon iron. |

ii) The main function of a fish plate is

- | |
|--|
| a) to join the two rail together |
| b) to join rails with the sleeper |
| c) to allow rail to expand and contract freely |
| d) none of these. |



- iii) Gauge is the distance between
- a) centre to centre of rails
 - b) running face of rails
 - c) outer faces of rails
 - d) none of these.
- iv) The formation width for a single line metre gauge track in embankment as adopted on Indian Railways is
- a) 4.27 m
 - b) 4.88 m
 - c) 5.49 m
 - d) 6.10 m.
- v) Which of the following methods of designation of crossing is mostly used in India ?
- a) Centre line method
 - b) Right angle method
 - c) Isosceles angle method
 - d) None of these.
- vi) Yellow light hand signal indicates
- a) wheel burns
 - b) hogging of rails
 - c) scabbing of rails
 - d) corrugation of rails.



- vii) Which of the following is an example of failure in flexible pavements ?
- a) Alligator cracking b) Mud pumping
c) Warping cracks d) Shrinkage cracks.
- viii) Which of the following is used for serving and repairs of the aircraft ?
- a) Apron b) Hunger
c) Terminal building d) Holding apron.
- ix) 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.
- x) Which of the following is a fixed type mooring accessory ?
- a) Bollard b) Buoys
c) Cables d) Anchors.
- xi) 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-eight highest waves.



GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Draw typical dimensioned sketch of the cross-section of a Broad Gauge track in embankment showing the various elements.
3. What is creep ? Briefly describe the procedure of measurement of creep.
4. What are the requirements of rails ?
5.
 - a) Define track capacity.
 - b) Using a sleeper density of $M + 5$, find out the number of sleepers required for constructing a railway track 640 m long. (B. G. Track).
6. How do you define the superelevation ? What are the objects of providing superelevation on curves of a railway track ?
7. Define runway and taxiway. Give neat sketch of a single runway airport.
8. What are the requirements of a good harbour ?



GROUP – C

(Long Answer Type Questions)

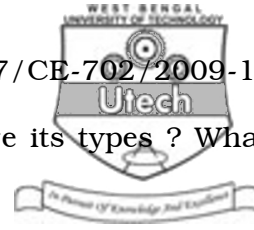
Answer any *three* of the following.

3 × 15 = 45

9. a) Define gauge of railway track. Enumerate different gauges used in India.
- b) Draw a typical dimensional sketch of the cross-section of a broad gauge track in embankment showing the various elements.
- c) What do you mean by hauling capacity of a locomotive ?
- d) A locomotive on B.G. track has three pairs of driving wheels, each carrying 20 tonnes. What maximum load it can pulled on level track with curvature 2 degree at 50 km/h ?
2 + 5 + 3 + 5
10. a) What are the function of sleepers ?
- b) What would be the expression for sleeper density if the rail length used in a track is 19 m and there are 22 sleepers under one rail length ?
- c) What are the requirements of good ballast ?
- d) Discuss the criteria for deciding the length of the track.
5 + 2 + 5 + 3



11. a) Define negative superelevation.
- b) On a BG 3 degree curve the 'Equilibrium Cant' is provided for a speed of 70 km/h.
- i) Calculate the value of equilibrium cant.
- ii) Allowing a maximum cant deficiency, what would be the maximum permissible speed on the track ?
- c) Classify the types of railway stations.
- d) Write short notes on
- i) semaphore signal,
- ii) shunting signal. $2 + 3 + 4 + 3 + 3$
12. a) What are the requirements of good harbour ?
- b) Explain the terms 'littoral drift' and 'neap tide'.
- c) Write short note on Tetrapods.
- d) Determinate between dry docks and wet docks.
- e) What is a light house ? $3 + 4 + 3 + 3 + 2$



13. a) What is windrose diagram ? What are its types ? What are the differences between them ?

b) Calculate the actual length of the runway from the following data :

Airport elevation	—	RL 100
Airport reference temperature	—	28° C
Basic length of runway	—	600 m
Highest point along the length	—	RL 98.2
Lowest point along the length	—	RL 95.2.

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