15990

BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.CE-2022/Dip.CE-2023
Course Name – Transportation Engineering
Course Code - DCEPC404
(Semester IV)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Select a general classification of roads based on traffic volume.
a) Expressways b) Highways
c) Arterial roads d) Collector roads

(ii) Identify the factor primarily affecting road alignment.
a) Weather conditions b) Terrain and topography
c) Population density d) Availability of materials

(iii) Select the factor that does not affect the design speed according to IRC recommendations.
a) Terrain b) Traffic volume
c) Roadside development d) Road alignment

(iv) Identify the definition of gradient in highway design.
a) The slope of the pavement b) The curvature of the road
c) The change in elevation over a horizontal distance d) The width of the road

(v) Select the factor not considered in the calculation of sight distance.
a) Driver reaction time b) Vehicle speed
c) Roadside vegetation d) Roadway condition

(vi) Identify the test used to evaluate the Flakiness and Elongation Index of aggregates.
a) Penetration test b) Flakiness and Elongation Index test
c) Ductility test d) Angularity Number test

(vii) Identify the method used in the construction of flexible pavements that involves laying materials in alternating layers.
a) Continuous Bay Method b) Alternate Bay Method
c) Marshall Method d) Slipform paving

(viii) Select the component used to improve the adhesion between layers in bituminous road construction.

a) Prime coat b) Tack coat
c) Seal coat d) Base coat

(ix) Select the test used to assess the angularity of aggregates.

a) Flakiness and Elongation Index test b) Angularity Number test
c) Penetration test d) Softening point test

(x) Select the type of rail fixture used for fastening rails to concrete sleepers.

a) Chair b) Fish plate
c) Spike d) Bolt

(xi) Select the factor that does not affect the selection of rail gauge.

a) Terrain b) Climate
c) Passenger traffic d) Economic considerations

(xii) Choose the correct definition of super elevation.

a) Elevation above sea level b) Elevation above the formation level
c) Banking of the outer rail on curves d) Banking of the inner rail on curves

(xiii) Choose the correct limits of super elevation on curves for Indian Railways.

a) 1 in 200 b) 1 in 100
c) 1 in 75 d) 1 in 50

(xiv) Choose the correct factors affecting rail alignment.

a) Terrain b) Curvature
c) Train speed d) All of these

(xv) Choose the correct definition of standard cross section.

a) Typical profile of a railway track b) Typical layout of a railway track
c) Typical alignment of a railway track d) Typical structure of a railway track

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the significance of prime coat in Bituminous Road construction. (3)
3. Define the components of the Permanent way. (3)
4. Select the components of a track triangle and explain how it facilitates smooth transitions between tracks. (3)
5. Discuss the types of camber as per IRC recommendations. (3)
6. Compare the standard cross section of a single-line track in cutting with that in embankment. (3)

OR

Explain the importance of permanent land and formation width in the detailed plan of railway alignment. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. classify the design speed of a highway considering various factors outlined by IRC recommendations. (5)
8. Develop a comprehensive comparison between the merits and demerits of WBM and WMM roads, considering factors such as cost-effectiveness, durability, and maintenance requirements. (5)
9. Identify the function of ballast in railway tracks, describe its types, and evaluate their suitability in different railway construction scenarios. (5)
10. Area of Maharashtra is 308,000 km² number of towns is 216 and number of villages 41833. calculate the length of all the roads according to 3rd 20 years road plan. (5)
11. Calculate SSD for V=50 kmph for (i) Two-way traffic in a two lane road (ii) Two-way traffic in a single lane road Use, f=0.37, Reaction time of driver, tr=2.5" (5)

12. Design a flexible pavement considering the types of bitumen available and their properties. Discuss the implications of selecting different types of bitumen on the pavement's performance and durability. (5)

OR

Develop a comprehensive plan for constructing a rigid pavement using the Alternate Bay Method. Include details about construction joints, fillers, and sealers, and evaluate their impact on the overall strength and longevity of the pavement. (5)

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