

## TRANSPORTATION ENGINEERING-II

Time : 3 Hours

Min. Passing Marks : 24

Maximum Marks : 80

**Instructions to Candidates :**

Attempt any five questions selecting one question from each unit. All questions carry equal marks. Diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Quantities used/calculated must be stated clearly.

**Unit-I**

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- (a) Enlist the different materials used as ballast. Also explain the functions and requirements of good quality ballast to be used for railways. [8]
- (b) Explain with the help of neat Diagram the term "Coring of Wheels". [8]

**OR**

- (a) Describe the functions and requirements of sleepers to be used for railways. Also enumerate the classification of sleepers according to material used. [8]
- (b) Explain the different types of Rail failures with the help of neat diagrams. [8]

**Unit-II**

- (a) Enlist the different types of crossings. Explain with help of neat diagram the "Spring Crossing". Also name the different components in the diagram. [8]
- (b) Explain in detail the recent developments in Railway networking. [8]

**OR**

- (a) Enlist the various component parts of switches. Draw the neat diagram of fixed heel type switch mentioning the names of different parts. [8]
- (b) Explain the elevated railway systems. Discuss the merits and demerits of elevated railway system over underground railway system. [8]

**Unit-III**

- (a) Explain the different types of Gradients and write their permissible values adopted on Indian Railways. [8]
- (b) Determine the length of transition curve and draw the offsets at every 15m. Given that the design

speed of the train on curve is 90 km. per hour on a Broad Gauge track. [8]

**OR**

- (a) Explain Grade compensation and its necessity at curves. What should be the compensated gradient provided, if the ruling gradient as 1 in 250 has been fixed on a B.G. section and a horizontal curve of  $3^\circ$  is also to be introduced over it. [8]
- (b) Explain the terms 'Super elevation' and 'Cant deficiency' in brief. Also write the limits of super elevation and cant deficiency for Indian Railways. [8]

**Unit-IV**

- (a) Enlist the various factors considered for the airport site selection. Explain any five important factors in brief out of the various factors listed. [8]
- (b) Explain the factors controlling taxiway layout and turn around taxiway. [8]

**OR**

- (a) What do you understand by the term 'Zoning' explain. Also explain the different zones and zoning laws. [8]
- (b) Explain the following terms : [2x4=8]
  - Wind Rose diagram
  - Apron

**Unit-V**

- (a) Discuss the various design factors to be considered in determining the Airport pavement thickness. [8]
- (b) Discuss the Westergaard's method for design of Air field Rigid pavement. [8]

**OR**

- Enlist the various Design methods of Airfield flexible pavements. Also explain each method for designing the pavement thickness of airfield flexible pavements. [10]