

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2456

Roll No.

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**B. Tech.**

(SEM. VI) THEORY EXAMINATION 2011-12

**TRANSPORTATION ENGINEERING—2**

Time : 2 Hours

Total Marks : 50

- Note :—**(1) Attempt *all* questions.  
(2) If required any missing data; then choose suitably.

1. Attempt any *four* parts of the following :— (3.5×4=14)
- Draw a typical cross-section of a permanent way on embankment. Describe the requirements of an ideal permanent way.
  - Discuss any one of the theory of Creep of rails.
  - What are the requirements of fish plates ? Describe the reasons of the failure of fish plates.
  - What do you mean by Composite Sleeper Index ? A BG track has a sleeper density of  $(M + 6)$ . The track is laid on the welded rails of length 26 m. Find out the number of sleepers on the rail length.
  - What is the minimum depth of ballast section ? Explain also the Screening of ballast.
  - Give the name of any four laboratory tests for getting the physical properties of the ballast. Also discuss the impact value test for the ballast.

2. Attempt any *two* parts of the following :— (6×2=12)

- (a) Calculate the superelevation and the maximum permissible speed for a 2° BG transitioned curve on a high-speed route with a maximum sanctioned speed of 110 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h.
- (b) What do you mean by the compensation for curvature on gradients ? Also write about the negative super elevation.
- (c) Differentiate between the hauling capacity and the tractive effort of a locomotive.

Calculate the maximum permissible train load that can be pulled by a locomotive with four pairs of driving wheels with an axle load of 28.42 t each on a BG track with a ruling gradient of 1 in 200 and a maximum curvature of 3°, travelling at a speed of 483 km/h take the coefficient of friction to be 0.2.

3. Attempt any *two* parts of the following :— (6×2=12)

- (a) Briefly describe the various factors which influence the selection of site for a railway station. Classify the 'A class' and 'C class' railway stations with help of their neat sketches.
- (b) What is the purpose of providing marshalling yards ? What are the points to be considered in the design of marshalling yards ? Also write the main features of marshalling yards.

(c) What are the different systems of controlling the movement of trains ? Briefly describe the absolute block system of controlling the movement of trains for single and double lines.

4. Attempt any *two* parts of the following :— (6×2=12)

(a) For the planning of an airport; mention in brief various surveys required to be conducted for collecting various details.

(b) The runway length required for landing at sea level in standard atmospheric condition is 3000 m. Runway length required for take-off at a level site at sea level in standard atmospheric conditions is 2500 m. Aerodrome reference temperature is 25°C and that of the standard atmosphere at aerodrome elevation of 150 m is 14.025 °C. If the effective runway gradient is 0.5%, determine the runway length to be provided.

(c) What is the purpose of navigation aids ? What are the various types of aids used on shore at sea ?