

**B. TECH.**  
**(SEM VIII) THEORY EXAMINATION 2018-19**  
**TRANSPORTATION ENGINEERING - II**

Time: 3 Hours

Total Marks: 100

**Note:** 1. Attempt all Sections. If you require any missing data, choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2 x 10 = 20**

- a. How many gauges exist in Indian Railways? Give their widths and route kilometers.
- b. What ballast material would you suggest for high-speed tracks and why?
- c. What is meant by 'track modulus'? Indicate its usual range of values for a broad gauge track.
- d. How the railway stations are classified?
- e. What are the requirements of a good ballast?
- f. Define the term ATS.
- g. Using a sleeper density of  $n+5$ , find out the number of sleepers required for constructing a railway track (BG) 640m long.
- h. What are the components of a permanent way?
- i. Define Littoral drift.
- j. Differentiate between port and harbor.

**SECTION B**

**2. Attempt any three of the following: 10 x 3 = 30**

- a. What is signaling? What are the objectives of signaling? List the types of signals.
- b. Write a note on i. Marshalling yards and ii. Locomotive yards
- c. Determine the equilibrium cant on a  $2^\circ$  curve on a broad gauge, if 16 trains, 10 trains, 8 trains, 4 trains and 2 trains are running at a speed of 50Kmph, 60Kmph, 70Kmph, 80Kmph and 100Kmph respectively. Also, determine the deviation from maximum speed.
- d. Explain various functions of interlocking.
- e. What are the factors to be considered for the selection of harbors on a sandy coast and lower reach of a river?

**SECTION C**

**3. Attempt any one part of the following: 10 x 1 = 10**

- (a) With neat sketch, explain what is coning of wheels and the advantages of coning of wheels.
- (b) Calculate the super elevation, maximum permissible speed, and transition length for a  $3^\circ$  curve on a high – speed BG section with a maximum sanctioned speed of 110 Km/h. Assume the equilibrium speed to be 80 Km/h and the booked speed of the goods train to be 50 Km/h.

4. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Explain briefly the various factors considered in the selection of site for airport.
- (b) An airport is planned at an elevation of 380m above MSL. The monthly mean of maximum and average daily temperatures for the hottest month at the site are 40°C and 28°C respectively. The effective gradient is 0.18 percent. Determine the length of runway required at the proposed site if the basic runway length is 1900m.
5. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is dry dock? Explain the construction and uses of dry dock
- (b) What is the principle of stop signal? Explain its components with the help of a neat sketch.
6. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) Explain the role of rail transportation in the development of a country
- (b) In a layout of a B.G. yard, an 8° curve diverges from a 5° main curve. If the maximum permissible speed on the main curve is 65 Kmph, determine the restricted speed on diverging curve.
7. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is a transition curve? What are the different types and what are the requirements for an ideal transition curve?
- (b) Explain briefly the functions of the following in a railway track.
- i. Hook bolt
  - ii. Fish Plate
  - iii. Tie bar
  - iv. Cotters
  - v. Screw spike