

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question each from section ABCD which is of 10 marks each. Question no. 9 Section E is compulsory, which is of 20 marks.

SECTION - A

1. (a) What is meant by wear of Rails? Enumerate the various types of Rail wear and enlist the methods by which it can be measured. (5)
- (b) What are the functions of Rails and Sleepers? (5)
2. (a) Enumerate the role of Indian Railways in National development. (5)
- (b) Discuss about the maintenance and renewal of rails, sleepers and track fittings. (5)

SECTION - B

3. Calculate the super-elevation 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 super-elevation as decided by the chief engineer is 80 km/h and the booked speed of goods trains is 50 km/h. (10)
4. (a) A 6° curve diverges from a 4° main curve in reverse direction in the layout of a B.G. track. Speed on branch line is restricted to 35 kmph. Determine the restricted speed on main line. (5)

- (b) Discuss wave theory and percussion theory with respect to creep of rails. (5)

SECTION - C

5. (a) Enlist and discuss the factors to be considered for the selection of the site of an airport. (5)
- (b) Length of a runway at Mean Sea Level (MSL), standard temperature and zero gradients is 1500 m. The site has an elevation of 1000 m above MSL, with a reference temperature of 34.0°C. The runway has to be constructed with an effective gradient of 0.26%. Determine the actual length of the runway at the site. (05)
6. (a) Differentiate between Mechanical and Electrical signaling systems. (5)
- (b) What is a Wind rose diagram? What are its types? Explain one. (5)

SECTION - D

7. (a) Explain following aircraft characteristics and their influence in planning and design of an airport:
 - (i) Type and size of aircraft
 - (ii) Weight and wheel configuration
 - (iii) Speed of aircraft
 - (iv) Minimum turning radius(5)
- (b) What are the design considerations applicable to runway lighting? (5)
8. Discuss the Rigid overlay designs for strengthening airfield pavements. (10)