

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) EXAMINATION 2023

[Third Year; Second Semester]

Transportation Engineering - I

Total Time: Three Hours

Full Marks 100
(Part I: 60 + Part II: 40)

Use a separate Answer-Script for each part

PART I (60 Marks)

Answer brief & to the point. Assume standard value for any parameter, if required

1. Briefly explain any three of the following 5 x 3
 - a. Role of the following vehicular characteristics on geometric design of highways – Length, Width, Height, Acceleration, Turning Ability
 - b. The major recommendations of Jayakar Committee
 - c. Difference in Capacity definition between HCM 1950 and HCM 1985
 - d. Vision Characteristics of a road user in context with Traffic Engineering

2. Write short note on OR explain any three of the following: 5 x 3
 - a. Cant deficiency and Cant excess
 - b. Requirements of a good balast
 - c. Factors influencing choice of railway gauge
 - d. Sleeper Density and spacing

3. Calculate the superelevation and the maximum permissible speed for a 3° BG transitioned curve on a high-speed route with a maximum sanctioned speed of 100 km/h. The speed for calculating the equilibrium superelevation as decided by the chief engineer is 75 km/h and the booked speed of goods trains is 40 km/h. The permissible cant excess and cant deficiency may be considered as 75mm and 100mm respectively 10

4. A BG branch line track takes off as a contrary flexure through a 4° from a main line track of a 3° curvature. Due to the turnout, the maximum permissible speed on the branch line is 25 km/h. Calculate the negative superelevation to be provided on the branch line track and the maximum permissible speed on the main line track (when it takes off from a straight track) 8

5. The design flow, mean free speed and average vehicle length on a roadway are 2000 veh/hr, 60KmpH and 5.0m respectively. Determine the required number of lanes for the following cases –
 - a. Under basic capacity condition 4
 - b. Under LoS C condition with design speed as 75% of mean free speed and maximum permissible flow capacity ratio of 0.3 8

