

II B. Tech I Semester Supplementary Examinations, September - 2021
TRANSPORTATION ENGINEERING-I
 (Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit
 All Questions Carry **Equal** Marks

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- 1 a) Discuss the Highway development in India.  
 b) List different unconventional transportation systems and discuss them concerning their technological and operational characteristics.

**Or**

- 2 a) Explain the role of Highway Transportation in the Economic development of India.  
 b) Define Detailed Project Report. Discuss the engineering surveys to be carried out to connect two habitations.
- 3 a) An NH passing through a flat terrain has a horizontal curve of radius equal to the ruling radius. Design all the geometric features of this curve, assuming relevant data.  
 b) Design two-phase traffic signals by Webster's method. The average normal flows of traffic on crossroads P and Q during the design period are 450 and 300 PCU per hour; the saturation flow values on these roads are estimated as 1250 and 1000 PCU per hour. The all-red time for pedestrian crossing is 12 sec.

**Or**

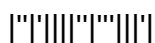
- 4 a) A vehicle skids through a distance equal to 35 m before colliding with another parked vehicle, the weight of which is 80 percent of the former. After the collision, if both vehicles skid through 15 m before stopping, compute the initial speed of the moving vehicle. Assume a friction coefficient of 0.60.  
 b) Calculate the set-back distances required from the centerline on the inner side of the curve to provide for  
 a) Stopping sight distance of 90 m  
 b) Safe overtaking sight distance of 300 m  
 The radius of the horizontal highway curve is 400 m, and the length is 200 m. The distance between the centerlines of the road and the inner lane is 1.8 m.
- 5 a) Discuss the importance of spot speed and delay studies along with data analysis.  
 b) List different types of at-grade intersections and explain any three with neat sketches.

**Or**

- 6 a) Draw a neat sketch of a fundamental flow diagram. Explain its salient features.  
 b) What are the various traffic control devices? Explain their role in traffic management.
- 7 a) How do you judge the suitability of soil and aggregates for pavement construction? Discuss.  
 b) Enlist step-by-step procedure of Marshall Method of Mix Design.

**Or**

- 8 List various joints in rigid pavement and their effect on rigid pavement performance.



- 9 Sketch a generalized multilayered elastic system and list the assumptions made in the analytical solution to the state of stress or strain. Calculate the rebound surface deflection on a single layer pavement under a wheel load of 40kN with tire pressure of 0.8 Mpa. The effective elastic modulus of subgrade may be taken as 40 Mpa.

**Or**

- 10 Explain the CBR method of pavement design for high-volume roads.

