Code No: 137HX

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, October/November - 2020
TRANSPORTATION ENGINEERING
(Common to CE, CEE)

Time: 2 hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

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1. Explain briefly the modified classification of road system in India as per the Third Road Twenty Year Development Plan, 1981 – 2001. [15]

2.a) Discuss the significant recommendations of Jayakar Committee report? Mention how this helped in road development in India.
b) Explain with neat sketches the various factors controlling the alignment of roads. [8+7]

3.a) Derive an expression for finding the stopping sight distance at level and at grades.
b) The speeds of overtaking and overtaken vehicle are 80 and 60 kmph respectively. The acceleration of the overtaking vehicle is 2.5kmph per second, calculate the safe passing sight distance for (i) one-way traffic; (ii) two-way traffic. [7+8]

4. While aligning a highway in a built up area, it was necessary to provide a horizontal circular curve of radius 325m. Design the following geometric features: (a) Super elevation, (b) Extra Widening of pavement, (c) Length of transition curve. [15]

5.a) Explain the relationship between speed and concentration. Derive them and provide plots for them.
b) Vehicle 'A' is approaching from west and vehicle 'B' from south. After collision 'A' skids 600 north of east and 'B' skid 300 south of east. Skid distance before collision for 'A' is 18 m and 'B' is 26 m. The skid distances after collision are 30m and 15 m respectively. Weight of 'A' and B are 4500 and 6000 respectively. Skid resistance of pavement is 0.55 m. Determine the pre-collision speed. [7+8]

6. From an in-out survey consisting of 50 bays, the initial count was 18. The number of vehicles coming in and out of the parking lot for a time interval of 5 minutes is shown below. Find the accumulation, total parking load, average occupancy, and efficiency of parking lot. [15]

Time	5	10	15	20	25	30
IN	7	6	3	3	7	4
OUT	2	4	5	2	8	3

7. Explain grade separated intersection, the advantageous and limitations. [15]

8.a) Explain the design of flexible pavement using empirical mechanistic method.
b) A concrete slab 7.5 m long, 3.5 m wide and 25 cm thick, is subjected to a temperature differential of 10.5 ^{0}C. Assuming that k = 50.0 MN/m^3 and $t = 9 \times 10^{-6}$ /^{0} C. Determine the maximum curling stress in the interior, edge and corner of the slab. Take the radius of contact as a = 150 mm. [7+8]

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