

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: B.TECH
BRANCH: CIVIL ENGINEERING**

**SEMESTER : V/ADD
SESSION : MO/2025**

SUBJECT: CE305 TRANSPORTATION ENGINEERING

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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| Q.1(a) Explain the requirements of camber in road surface. | [2] | 1 2 |
| Q.1(b) Calculate the safe stopping sight distance for design speed of 50 km/h for
(a) Two way traffic on a two lane road.
(b) Two way traffic on a single plane road.
Assume coefficient of friction = 0.37 and reaction time of driver = 2.5 seconds. | [3] | 1 3 |
| Q.2(a) Explain the requirements of superelevation at horizontal curve. | [2] | 1 2 |
| Q.2(b) The radius of horizontal curve is 100 m. The design speed is 50 km/h and co-efficient of lateral friction is 0.15.
(a) Calculate the superelevation required if full lateral friction is assumed to develop.
(b) Calculate the coefficient of friction needed if no superelevation is provided.
(c) Calculate the equilibrium of superelevation if the pressure on inner and outer wheels should be equal. | [3] | 1 3 |
| Q.3(a) Discuss the difference between space mean speed and time mean speed. | [2] | 2 2 |
| Q.3(b) The consolidated data collected from speed and delay studies by floating car method on a stretch of urban road of length 3.5 km, running North- South are given below. Determine the average values of volume, journey speed and running speed of the traffic stream along North-South direction only. | [3] | 2 3 |

Trip No.	Direction of trip	Journey time Min- Sec	Total stop delay Min- Sec	No. of vehicles overtaking	No. of vehicle overtaken	No. of vehicles from opposite direction
1	N-S	6-32	1-40	4	7	268
2	S-N	7-14	1-50	5	3	186
3	N-S	6-50	1-30	5	3	280
4	S-N	7-40	2-00	2	1	200
5	N-S	6-10	1-10	3	5	250
6	S-N	8-00	2-22	2	2	170
7	N-S	6-28	1-40	2	5	290
8	S-N	7-30	1-40	3	2	160

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| Q.4(a) Write short notes on PCU. | [2] | 2 2 |
| Q.4(b) Explain about origin and destination study. | [3] | 2 2 |
| Q.5(a) Explain the difference between flexible pavement and rigid pavement. | [2] | 3 2 |
| Q.5(b) Discuss the different layers of flexible pavement. | [3] | 3 2 |