BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.Tech **SEMESTER : VI**
BRANCH: Civil Engineering **SESSION : SP/2024**

SUBJECT: CE438 TRAFFIC ENGINEERING AND MANAGEMENT

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Discuss speed-density relationship of traffic flow with neat sketch.	[5]	1	2
Q.1(b)	The length of a road stretch used for conducting the moving observer test is 0.5 km and the speed with which the test vehicle moved is 20 km/hr. The data from four moving observer test methods are shown in the table. Column A gives the sample number, column B gives the number of vehicles moving against the stream, column C gives the number of vehicles that had overtaken the test vehicle, and last column (D) gives the number of vehicles overtaken by the test vehicle. Find the three fundamental stream parameters for each set of data.	[5]	1	2

A (Sample No.)	B	C	D
1	107	10	74
2	113	25	41
3	30	15	5
4	79	18	9

Q.2(a)	Explain about lane changing models.	[5]	2	2
Q.2(b)	In a two lane, one way stream of 1000 veh./hour with 360 vehicles in lane A and the remaining vehicles in lane B. 8% of vehicles in lane A have gap less than 1 sec. and 18% of the vehicles in lane A have gaps less than 2 sec. Compute the time during which vehicles in lane B may not change to lane A in 1 hour. Assume driver requires one second ahead and behind in making a lane change.	[5]	2	3

Q.3(a)	In an intersection, the following data was observed for stopping times for vehicles as tabulated in Table. Calculate intersection approach delay for the given data set. Total exiting vehicles: 100.	[5]	3	3

	Seconds into minute			
Minute	0 sec	15 sec	30 sec	45 sec
5.00 pm	2	4	1	3
5.01 pm	4	5	3	0
5.02 pm	6	3	2	1
5.03 pm	2	5	4	3
5.04 pm	4	2	6	4
5.05 pm	5	4	1	1
5.06 pm	1	2	5	5
5.07 pm	4	3	3	3
5.08 pm	2	5	2	2
5.09 pm	3	1	4	2

Q.3(b)	Discuss about conflicting volume at an uncontrolled intersection.	[5]	3	2

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Q.4(a)	Discuss about of congestion pricing system.	[5]	4	3
Q.4(b)	On a 2.8 km long link of road, it was found that the demand is 1000 Vehicles/hour, mean speed of the link is 12 km/hr, and the free flow speed is 27 km/hr. Assuming that the average vehicle occupancy is 1.2 person/vehicle, calculate the congestion intensity in terms of total person hours of delay.	[5]	4	3
Q.5(a)	Discuss about application of Intelligent Transportation Systems (ITS) in travel and traffic management.	[5]	5	3
Q.5(b)	Explain the requirements of Intelligent Transportation Systems (ITS) in advanced vehicle control and safety systems.	[5]	5	3

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