

TE (CIVIL) Sem VI TE & M R19 C-scheme 26.05.2025

(3 Hours)



[Total Marks: 80]

Note:

- i. Q. No. 1 is compulsory
- ii. Attempt any 3 out of remaining 5

1. Solve any four (20 M)
 - A. How can traffic studies help in designing smart cities?
 - B. Explain different types of intersections
 - C. Discuss the role of statistics in traffic engineering.
 - D. Write about the following traffic flow characteristics and give the relationship among them (i) Speed (ii) Volume (iii) Density.
 - E. Discuss measures to reduce accidents.

2.
 - A. Explain the traffic Management system. (10 M)
 - B. Table gives result of the survey of vehicles in parking lot. Find accumulation, total parking load, average occupancy and efficiency of parking lot of 30 capacity. (10M)
Assume initially 15 cars were parked.

Time(min)	5	10	15
In	3	2	4
Out	2	4	2

3.
 - A. How do different methods of Origin and Destination (O-D) data collection compare in terms of accuracy, applicability, and limitations? (10 M)
 - B. Explain moving observer method in detail. Design 2 phase signal using webster's method when only straight-ahead traffic is permitted. Also draw phase diagram. (10M)

	N	S	E	W
Design Flow (q)	800	400	750	1000
Saturation Flow (s)	2400	2000	3000	3000

4.
 - A. Explain stepwise process for Moving Observer Method. (10 M)
 - B. Two lane road has a capacity of 2000 vehicles per hour. If one lane is closed for maintenance, find the speed of queue generation if the free flow is 1500 vehicles per hour and flow at bottleneck is 900 vehicles per hour. Headway at jam is 6.25 meter. (10M)

Q P code
86345

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prg code
1 T00636

5. A. Write a note on (10 M)
- Road safety audit
 - Advanced Traffic Management Systems (ATMS)
- B. Calculate the optimum spacing between successive street lighting poles based on the following design parameters: (10M)
- Width of the carriageway: 11 meters
 - Mounting height of luminaires: 12 meters
 - Luminaire specification: 250-watt High-Pressure Sodium (HPS) lamp with a luminous efficacy of 100 lumens per watt
 - Target average illuminance (lux level): 6 lux
 - Coefficient of Utilization (CU): 0.26
 - Lamp Lumen Depreciation (LLD) Factor: 0.88
 - Luminaire Dirt Depreciation (LDD) Factor: 0.90
6. A. A one-way expressway with three lanes is currently operating with a traffic volume of 4050 vehicles per hour. Due to an incident, two of the lanes are closed, only one lane functional. It takes 90 minutes to resume full capacity by clearing the obstruction. The design capacity per lane is 2000 vehicles per hour. Based on the above conditions, determine the following: (10 M)
- What is the maximum queue length, in terms of the number of vehicles that develops during the lane closure?
 - Estimate the total delay.
 - How many vehicles are affected during the reduced-capacity period?
 - Calculate the average delay per affected vehicle in minutes.
- B. Discuss how speed characteristics influence traffic flow, congestion levels, and overall roadway performance across each LOS category. Additionally, analyze the implications of these speed-based conditions on transportation planning, capacity analysis, and road network efficiency. (10M)

