

Guru Ghasidas Vishwavidyalaya (A Central University)
School of Studies of Engineering and Technology
Department of Civil Engineering, B.Tech , 8th Semester
End Semester Examination (2024-25)
Traffic Engineering (CE208TPE05D)
Max. Marks: 70

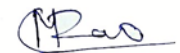
Note:

1. The question paper consists of 2 sections.
2. All questions in “section A” are mandatory comprising of 2 marks each.
3. “Section B” consists of 5 questions of 10 marks each.
4. Write the answers for both the sections (A & B) separately.

Section A		
All questions are mandatory (10 × 2 = 20)		
1.	Mention at least four scopes of traffic engineering.	CO-1
2.	What do you mean by a design driver? Outline few characteristics of design driver.	CO-1
3.	Differentiate between time mean speed and space mean speed.	CO-2
4.	Explain saturation flow rate and saturation headway.	CO-2
5.	How can you eliminate the dilemma zone at a signalized intersection?	CO-3
6.	List out various methods for signal design.	CO-3
7.	Mention ill effects of parking.	CO-4
8.	How the detrimental effects of parking could be mitigated?	CO-4
9.	Write a short note on Psychological effect of noise.	CO-5
10.	List out some major pollutants which are in the form of exhaust gas.	CO-5

Section B		
Attempt any 2 parts out of 3 from each question (5 × 10 = 50)		
1.a.	What are the functions of traffic engineering?	CO-1, BTL-1
1.b.	Outline the dynamic characteristics of vehicles. A vehicle travelling at 120 km/h speed, stopped within 2.5 seconds after the application of brakes. Determine the average skid resistance.	CO-1, BTL-1
1.c.	Explain various driver characteristics. A driver with 6/9 vision can see an object from 69 m distance. What is the distance that a normal person can see the object? What is the distance a design driver can recognize the object?	CO-1, BTL-2
2.a.	Explain in detail about highway capacity and level of service along with their classifications.	CO-2, BTL-2

2.b.	What were the limitations of Greenberg and Underwood macroscopic traffic models? Derive the expression for optimal traffic flow using Greenshields model, and draw neat diagrams to show the variations among traffic flow, speed and density.	CO-2, BTL-3																																							
2.c.	Briefly explain, space mean speed, time mean speed, traffic volume and traffic density.	CO-2, BTL-2																																							
3.a.	What do you mean by the dilemma zone at a signalized intersection? Derive the equation for the required amber time in order to eliminate the dilemma zone at the intersecting zone.	CO-3, BTL-3																																							
3.b.	Outline at least four IRC recommendations for the design of traffic signs. List out various methods of signal designing and explain the Webster method of signal designing.	CO-3, BTL-2																																							
3.c.	A four-legged right angled intersection is to be signalized with a fixed time two phase signal. The design hour flow and saturation flow are shown in the table. The time lost may be taken as 4 seconds per phase. Determine the optimum cycle time and apportion the green times in two phases with neat diagram.	CO-3, BTL-5																																							
	<table><tr><td rowspan="2">Design hour flow in PCU/hour</td><td>North</td><td>South</td><td>East</td><td>West</td></tr><tr><td>1000</td><td>500</td><td>800</td><td>700</td></tr><tr><td>Saturation flow in PCU/hour</td><td>2700</td><td>2000</td><td>3300</td><td>3000</td></tr></table>		Design hour flow in PCU/hour	North	South	East	West	1000	500	800	700	Saturation flow in PCU/hour	2700	2000	3300	3000																									
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4.a.	Outline various methods of On-street parking and explain each method with a neat diagram showing all the required dimensions including computation of number of parking bays.	CO-4, BTL-2																																							
4.b.	From an in-out survey conducted for a parking area consisting of 40 bays, the initial count was found to be 25. Table gives result of survey. The numbers of vehicles coming in and out of the parking lot for a time interval of 5 minutes is as shown in the table below. Determine the accumulation, total parking load, average occupancy and efficiency of parking lot.	CO-4, BTL-5																																							
	<table><tr><td>Time</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr><tr><td>In</td><td>3</td><td>2</td><td>4</td><td>5</td><td>7</td><td>8</td><td>2</td><td>4</td><td>6</td><td>4</td><td>3</td><td>2</td></tr><tr><td>Out</td><td>2</td><td>4</td><td>2</td><td>4</td><td>3</td><td>2</td><td>7</td><td>2</td><td>4</td><td>1</td><td>3</td><td>5</td></tr></table>		Time	5	10	15	20	25	30	35	40	45	50	55	60	In	3	2	4	5	7	8	2	4	6	4	3	2	Out	2	4	2	4	3	2	7	2	4	1	3	5
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4.c.	What do you understand by peripheral parking schemes? Explain briefly various types of schemes under peripheral parking.	CO-4, BTL-2																																							
5.a.	Outline and briefly discuss the detrimental effects of traffic on the environment.	CO-5, BTL-2																																							
5.b.	Discuss the various measures for controlling air pollution.	CO-5, BTL-2																																							
5.c.	Discuss the various techniques to control the traffic noise.	CO-5, BTL-2																																							



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