

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V(NEW) EXAMINATION – SUMMER 2022****Subject Code:2150601****Date:15/06/2022****Subject Name:Highway Engineering****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS	
<b>Q.1</b>	(a) Describe Nagpur road plan.	<b>03</b>	
	(b) Explain various factors controlling highway alignment.	<b>04</b>	
	(c) Describe analysis of overtaking sight distance.	<b>07</b>	
<b>Q.2</b>	(a) Define: Camber, Super elevation, Right of way.	<b>03</b>	
	(b) Explain total reaction time of driver and factors on which it depends.	<b>04</b>	
	(c) Describe advantages, disadvantages and types of traffic signals.	<b>07</b>	
<b>OR</b>			
<b>Q.3</b>	(c) Explain stepwise procedure of penetration test of bitumen.	<b>07</b>	
	(a) What is the need of parking study?	<b>03</b>	
	(b) Write a short note on pavement marking.	<b>04</b>	
<b>Q.3</b>	(c) Calculate the length of different categories of roads in a state in India using Lakhnow plan from the following data. Total area of the state = 80,000 sq. km. Total no of towns = 86	<b>07</b>	
	<b>OR</b>		
	(a) Explain slip and skid.	<b>03</b>	
<b>Q.3</b>	(b) Enlist methods of parking and explain any one in brief.	<b>04</b>	
	(c) Determine stopping sight distance on a highway at ascending gradient of 2 % for a design speed of 75 kmph. Assume other data as per IRC recommendations.	<b>07</b>	
	<b>Q.4</b>	(a) Draw cross section of MDR in cutting in Rural area	<b>03</b>
(b) State various factors to be considered for pavement design. What is ESWL?		<b>04</b>	
(c) Enlist and discuss desirable properties of soil in detail.		<b>07</b>	
<b>OR</b>			
<b>Q.4</b>	(a) Compare bitumen and tar.	<b>03</b>	
	(b) Explain road user characteristics in detail.	<b>04</b>	
	(c) What are the causes of road accidents? Describe preventive measures for road accidents.	<b>07</b>	
<b>Q.5</b>	(a) Define: Spot speed, PCU, Traffic volume.	<b>03</b>	
	(b) Explain with sketches how the subsurface drainage system is provided to lower the water level and control seepage flow.	<b>04</b>	
	(c) Enlist various tests for road aggregates. Describe abrasion test for road aggregates in detail.	<b>07</b>	
<b>OR</b>			
<b>Q.5</b>	(a) What are the causes of pavement failures?	<b>03</b>	
	(b) Discuss road side development.	<b>04</b>	
	(c) Describe typical failures in flexible and rigid pavements.	<b>07</b>	

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