GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Tech (Fourth Semester - Regular) Examinations, April – 2025

23BCVPC24002 – Transportation Engineering-I
(Civil Engineering)

Time: 3 hrs   Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

PART – A		**(2 x 5 = 10 Marks)**

Q.1. Answer *ALL* questions

		CO #	Blooms Level
a.	What is the function of camber in road pavement?	CO2	K2
b.	Define transition curve. Why is it needed?	CO2	K3
c.	State the importance of accident study and analysis.	CO3	K2
d.	Name quality control tests of bitumen and state their relevance.	CO4	K3
e.	Briefly explain channelization and its importance.	CO3	K2

PART – B		**(10 x 5 = 50 Marks)**

Answer *ALL* the questions

		Marks	CO #	Blooms Level
2. a.	Describe various modes of transportation and their limitations.	5	CO1	K2
b.	Discuss IRC recommendations for road classification.	5	CO1	K3
	(OR)			
c.	Explain the historical development of highway planning in India.	5	CO1	K3
d.	What are the factors influencing road alignment in hilly areas?	5	CO1	K3
3.a.	Design superelevation for R = 200 m, speed = 75 kmph. Take f = 0.16.	5	CO2	K4
b.	Compute SSD for 85 kmph. Assume t = 2.5s, f = 0.35, g = 9.81 m/s².	5	CO2	K4
	(OR)			
c.	Design transition curve length for R = 400 m, V = 70 kmph.	5	CO2	K4
d.	Explain need and components of vertical alignment.	5	CO2	K2
4.a.	Explain how volume studies done practically.	5	CO3	K2
b.	Calculate signal cycle time (Approach 1: 600 vph, Approach 2: 450 vph, Lost time = 4s, sat. flow = 1800 vph/lane)	5	CO3	K3
	(OR)			
c.	Differentiate at-grade and grade-separated intersections.	5	CO3	K2
d.	What is accident analysis? Explain causes and remedies.	5	CO3	K2
5.a.	State desirable properties of highway materials.	5	CO4	K2
b.	Explain procedure for determining specific gravity of bitumen and aggregates	5	CO4	K3
	(OR)			
c.	Steps in conducting quality control tests on aggregates.	5	CO4	K3
d.	Write short notes on: i) Penetration test ii) Softening point test	5	CO4	K3
6.a.	Describe in detail the steps involved in geometric design of highways. Derive expressions for sight distance (SSD and OSD)	10	CO5	K4
	(OR)			
b.	A curve of 250 m radius is to be designed for a highway with a design speed of 80 kmph. Compute the superelevation, transition curve length, and extra widening required. Assume suitable data.	10	CO5	K4

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