

**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)**



B. Tech (Fourth Semester – Regular/Supplementary) Examinations, April 2026

23BCVPC24004 - Transportation Engineering - I

Civil Engineering

Time: 3 hrs

Maximum: 60 Marks

**Answer ALL questions
(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. State the two main recommendations of the Jayakar Committee.	CO1	K1
b. List the target road lengths set in the Nagpur Road Plan (1943).	CO2	K1
c. Mention any four objectives of highway alignment.	CO3	K1
d. Differentiate between SSD and OSD.	CO4	K1
e. Write the formula for super elevation and state its units.	CO5	K1

PART – B

(10 x 5 = 50 Marks)

Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Provide a detailed account of the preliminary survey stage in highway alignment, including procedures and outputs.	5	CO1	K1
b. List and explain the types of drawings prepared during highway project development.	5	CO1	K1
(OR)			
c. Describe the different types of planning surveys conducted for highway projects, including their objectives and methods.	5	CO1	K2
d. State the objectives and key requirements for selecting an ideal highway alignment.	5	CO1	K3
3.a. Discuss the factors influencing the selection of highway alignment, including geometric, economic, and environmental considerations.	5	CO2	K2
b. Outline the engineering surveys required for highway alignment, specifying their purposes.	5	CO2	K2
(OR)			
c. Define Overtaking Sight Distance (OSD). Derive the formula for OSD.	5	CO2	K4
d. Calculate OSD for a design speed of 96kmph. Assume all other data	5	CO2	K3
4.a. Define super elevation. Derive the equation for super elevation on horizontal curves.	5	CO3	K2
b. Derive the equation for extra widening	5	CO3	K2
(OR)			
c. State the objectives of spot speed studies in traffic engineering and describe the procedure for conducting them.	5	CO3	K2
d. Define Passenger Car Unit (PCU). Discuss the factors affecting PCU values.	5	CO3	K3
5.a. Explain different types of traffic signals and traffic signal systems	5	CO4	K2
(OR)			

b.	Discuss the advantages and disadvantages of grade-separated intersections.	5	CO4	K2
c.	Describe the aggregate crushing test in detail, including apparatus, procedure, and significance.	5	CO4	K4
6.a.	Explain the Los Angeles Abrasion test for aggregates, including its procedure and interpretation.	5	CO4	K3
b.	Describe the method to determine the specific gravity of aggregates.	5	CO5	K2
(OR)				
c.	Elaborate on the penetration test for bitumen, including apparatus, procedure, and applications.	5	CO5	K2
d.	Explain the significance of the California Bearing Ratio (CBR) test in pavement design.	5	CO5	K2

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