Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 11-10-2025 **Time:** 11.45am to 01.15pm

School: SOE	**Program:** B.Tech in Civil	
Course Code :CIV2501	**Course Name:** Transportation Engineering	
Semester: III	**Max Marks**: 50	**Weightage**: 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**22**	**28**	**-**	**-**	**-**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	Define highway alignment and list any two disadvantages of improper highway alignment	**2 Marks**	**L1**	**CO1**
2	Write any two factors controlling highway alignment	**2 Marks**	**L1**	**CO1**
3	List any four desirable properties of an aggregates used for road construction	**2 Marks**	**L1**	**CO2**
4	Define the following a) Flakiness index b) Elongation index	**2 Marks**	**L1**	**CO2**
5	Write any four tests can be conducted in laboratory to assess the property of bitumen used for road construction	**2 Marks**	**L1**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	Define obligatory points in highway alignment. With the help of neat sketch explain any two obligatory points through which highway alignment should pass	**5 Marks**	**L2**	**CO1**
	b.	Identify the test and explain the test procedure, which is used to determine the toughness of an aggregates used for road construction in a laboratory	**5 Marks**	**L2**	**CO2**
		Or			
7.	**a.**	List and explain the requirements of an highway alignment	**5 Marks**	**L2**	**CO1**
	b.	Identify the test and explain the test procedure, which is used to determine the crushing strength of an aggregates used for road construction in a laboratory	**5 Marks**	**L2**	**CO2**

8.	**a.**	With the help of neat sketch explain the procedure of Ductility test which is used to determine the ductility value of a bitumen used for road construction.	**7 Marks**	**L2**	**CO2**
	b.	Explain the below mentioned stages in engineering surveys need to be conducted, to finalize the location for highway alignment. a) Map study b) Reconnaissance survey	**8 Marks**	**L2**	**CO1**
		Or			
9.	**a.**	With the help of neat sketch explain the procedure of penetration test which is used to determine the hardness or softness of a bitumen used for road construction	**7 Marks**	**L2**	**CO2**
	b.	Explain the below mentioned stages in engineering surveys need to be conducted, to finalize the location for highway alignment. a) Preliminary survey b) final location and detailed survey	**8 Marks**	**L2**	**CO1**

10.	**a.**	Explain Soundness test on aggregates which is used to	**5 Marks**	**L2**	**CO2**

		determine the resistance of aggregates against weathering action			
	b.	Which project would you give more preference among the road projects listed below Make your choice using the maximum utility value principle. Adopt a utility unit of 1.0 for serving a village with population <1000, a utility unit of 2.0 for serving a village with population range 1000 to 3000 and a utility unit of 5.0 for serving a village with population >3000. Also, adopt a utility unit of 1.0 for catering 1000t of agricultural products/100t of industrial products.	**10 marks**	**L3**	**CO1**

Road	Length (km)	No. of villages served with population of			Productivity (in 1000 tonnes)	
		<1000	1000-3000	> 3000	Agricultural	Industrial
A	20	40	10	5	25	0.8
B	35	50	20	8	15	0.6
C	30	20	10	3	30	1.2

Or

11.	**a.**	Explain the below mentioned desirable properties of aggregates used for road construction. a) Adhesion with bitumen b) Durability	**5 Marks**	**L2**	**CO2**
	b.	Select the best route among the options listed based on the principle of maximum utility: Adopt a utility unit of 1.0 for serving a village with population <1000, a utility unit of 1.5 for serving a village with population range 1000 to 2000 and a utility unit of 2.0 for serving a village with population >2000. Also, adopt a utility unit of 2.5 for catering 1000t of agricultural products/ 1 for 100t of industrial products.	**10 marks**	**L3**	**CO1**

Route	Length (km)	No. of villages served with population of			Productivity (in 1000 tonnes)	
		<1000	1000-2000	> 2000	Agricultural	Industrial
Route 1	20	20	12	15	15	1.0
Route 2	23	14	18	10	18	1.7
Route 3	19	10	15	20	20	2.0