Q. Code:144741

Reg. No. | | | | | | | | | | | | | | |

B. E / B. TECH.DEGREE EXAMINATIONS, MAY 2023

Fourth Semester

CE18405-TRANSPORTATION ENGINEERING I

(Civil Engineering)

***(Regulation 2018A*)**

TIME:3 HOURS **MAX.MARKS: 100**

CO1 After successful completion of this course, the students will be able to: Describe various factors considered in fixing alignment for a highway

CO2 Explain different components involved in highway geometric design.

CO3 Outline design methodology of flexible and rigid pavements.

CO4 Demonstrate different tests for highway materials; Illustrate various pavement distresses and remedial actions.

CO5 Discuss economic and financial aspects for highway projects.

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1	List any four organization related to highway development in India.	**1**	**2**
2	"While Population increases number of vehicles too increase in road" In the above statement, identify the dependent & independent variable.	**1**	**3**
3	Write the logic behind in providing a super elevation at road curves.	**2**	**3**
4	State the phenomenon of 'Rut formation on flexible pavement'.	**2**	**2**
5	What do you mean by 'fatigue damage'?	**3**	**2**
6	Why all the tests on bitumen are done in water bath?	**3**	**3**
7	Compare Non-destructive test with destructive test.	**4**	**2**
8	How pot holes are formed and developed further.	**4**	**3**
9	How PPP projects beneficial for highway development in India.	**5**	**3**
10	How codal provisions are helping in reducing vehicle operating cost. Give one example.	**5**	**3**

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11(a)	List the classification of road system in India and explain in detail.	**14**	**1**	**2**
	(OR)			
11(b)	Explain various types of surveys conducted to fix an alignment for a Greenfield highway.	**(14)**	**1**	**2**

12(a)	Describe the various cross sectional elements of a typical National Highway with neat sketches.	**(14)**	**2**	**2**
	(OR)			
12(b)	Derive an equation for calculation of a superelevation with a neat sketch.	**(14)**	**2**	**2**
13(a)	Explain various factors influencing the flexible pavement design.	**(14)**	**3**	**2**
	(OR)			
13(b)	**(i)** Compare flexible and rigid pavement.	**(4)**	**3**	**2**
	(ii) Explain in detail about the plate load test with diagram.	**(10)**	**3**	**2**
14(a)	Explain Los Angeles Abrasion test in detail. Draw necessary diagrams.	**(14)**	**4**	**2**
	(OR)			
14(b)	Explain various distresses in flexible pavement in detail.	**(14)**	**4**	**2**
15(a)	Show how a vehicle operating cost is an important component in economic justification of a road project. Justify your answer.	**(14)**	**5**	**3**
	(OR)			
15(b)	Calculate the annual cost of a stretch of highway from the following particulars:	**(14)**	**5**	**3**

Item	Total Cost, Rs (in lakhs)	Estimated in life, years	Interest Rate (%)
Bridges, culverts and drainage	**150.0**	**60**	**5**
Pavement	**250.0**	**10**	**7**
Traffic signs and road appurtenances	**25.0**	**10**	**9**

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16	List any 10 topics that you learned in highway engineering and justify how each topic is relevant in the real time applications in India.	**(10)**	**1-5**	**3**