Q. Code:984423

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

B.E./ B.TECH. DEGREE EXAMINATIONS, MAY 2024

Fourth-Semester

CE18405 – TRANSPORTATION ENGINEERING I

(Civil Engineering)

(Regulation 2018 / 2018A)

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

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	After successful completion of this course, the students will be able to Describe various factors considered in fixing alignment for a highway	**2**
CO 2	Explain different components involved in highway geometric design	**3**
CO 3	Outline design methodology of flexible and rigid pavements	**3**
CO 4	Demonstrate different tests for highway materials; Illustrate various pavement distresses and remedial actions	**2**
CO 5	Discuss economic and financial aspects for highway projects.	**2**

PART- A(10x2=20Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Write the classification of urban roads.	**1**	**2**
2.	How do you identify a National Highway by seeing the milestone?	**1**	**2**
3.	Explain off-tracking of a vehicle on a curve.	**2**	**2**
4.	Infer the word ‘sight distance’.	**2**	**2**
5.	State the standard axle load as per IRC.	**3**	**2**
6.	Explain the role of dowel bars in cement concrete pavements.	**3**	**2**
7.	Why soil is compacted at Optimum Moisture Content.	**4**	**2**
8.	State the basic principle of Benkelman beam.	**4**	**2**
9.	Expand DBFOT.	**5**	**2**
10.	Define VOC.	**5**	**2**

PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11. (a)	Briefly discuss the Jaykar Committee implications on road development in India.	**(14)**	**1**	**2**
	(OR)			
(b)	Explain the hierarchy system of rural roads in India. [10 marks] List the requirements for an ideal highway alignment. [4 marks]	**(14)**	**1**	**2**
12. (a)	Derive an equation for stopping sight distance with a neat sketch.	**(14)**	**2**	**2**
	(OR)			
(b)	Derive an equation for super-elevation with the aid of diagram.	**(14)**	**2**	**2**
13. (a)	Explain the factors likely to influence Flexible Pavement design.	**(14)**	**3**	**2**

(OR)

(b) Write a short note on: **(14) 3 2**
(a) Joints in cement concrete pavements [8 marks]
(b) Thermal Stresses [6 marks]

14. (a) Explain CBR test (laboratory procedure) in detail with a sketch. **(14) 4 3**

(OR)

(b) Explain the plate load test with a short note on Modulus of Subgrade Reaction (K). **(14) 4 3**

15. (a) Calculate the annual cost of a stretch of highway from the following data: **(14) 5 3**

Item	Total Cost, Rs in lakhs	Estimated Life, years	Rate of Interest, %
Land	45.0	90	6.0
Earthwork	50.0	50	6.2
Bridges	60.0	75	4.5
Pavement	120.0	20	9.5
Traffic appurtenances	25.0	10	7.0

(OR)

(b) The details of two alternate proposals for strengthening of an existing highway are given below. Present traffic is 2500 vehicle per day with a annual growth of 3%. Determine which alternative is more economical, if the rate of interest payable in all the cases is 7% per annum. **(14) 5 3**

S. No.	Overlay Type	Design life, years	Construction cost, Rs (lakhs) / km	Avg. maintenance cost/ km (Rs. In lakhs) during design period	Vehicle Operating Cost (per km) during design period
1	BM + SDBC	10	70	10	3.0
2	DBM + BC	15	90	5	2.0

PART- C (1x 10=10Marks)

(Q.No.16 is compulsory)

Marks CO RBT LEVEL

16. Develop a regression equation for the following data: **(10) 1 3**

Traffic, No. of vehicles	1215	1122	1063	975	745
Toll Rate, Rs./ Veh.	80	90	100	110	120

Calculate the traffic, if the toll is Rs.150 per vehicle.

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