R22 Regulation *Subject code: 4P5AA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, May 2025

TRANSPORTATION ENGINEERING

(CE)

Maximum Marks: 60 Date:24.06.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	What is the primary objective of highway planning in India?	1M	1	L1
b)	What is meant by "highway alignment" in road planning.	1M	1	L1
c)	What is meant by "sight distance" in highway geometric design?	1M	2	L1
d)	Why is super elevation applied on curved sections of highways?	1M	2	L1
e)	What are the three basic parameters of traffic flow in traffic engineering?	1M	3	L1
f)	Why is accident data recording important for traffic engineers?	1M	3	L1
g)	Name two types of traffic islands used in intersection design.	1M	4	L1
h)	Why is geometric design important for intersection safety and operational capacity?	1M	4	L1
i)	What are the two main types of pavements used in highway construction?	1M	5	L1
j)	Write the primary function of the sub-base layer in a flexible pavement?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Describe the key differences between the various road development plans implemented in India. How has each plan contributed to the expansion of India's road infrastructure?	10M	1	L2
	OR			
3	Critically evaluate the concept of need-based planning in road project initiation. What criteria should be prioritized to ensure sustainable and effective highway development?	10M	1	L2
4	Evaluate the role of design controls and criteria in highway geometric design. How do these controls ensure that highways meet safety, efficiency, and environmental standards?	10M	2	L2
	OR			
5	Assess the challenges and considerations in designing vertical alignment, including gradients and vertical curves, on steep terrains. What solutions can help overcome these challenges?	10M	2	L2

6	Evaluate the role of road markings in enhancing road safety and driver guidance. What challenges might arise in maintaining road markings, and how can these challenges be addressed?	10M	3	L2
	OR			
7	a) Assess the potential of Intelligent Transportation Systems (ITS) in managing urban traffic congestion. What are the main architectural components of ITS, and how do they improve traffic efficiency? b) Critically evaluate the significance of highway lighting in traffic engineering. What are the key considerations in designing effective highway lighting systems to enhance visibility and safety?	5M 5M	3	L2
8	a) Evaluate the effectiveness of rotary intersections in managing high traffic volumes. What are the key design criteria for a safe and efficient rotary, and how does it impact traffic flow? b) Discuss the impact of geometric design on intersection safety and operational capacity. How can geometry be optimized to improve traffic efficiency at intersections?	5M 5M	4	L2
	OR			
9	Assess the importance of design criteria for traffic islands in enhancing intersection safety. What are the potential risks if these criteria are not properly followed?	10M	4	L2
10	a) Evaluate the advantages and limitations of flexible pavements in terms of maintenance, cost, and performance. Under what conditions might flexible pavements be the preferred choice? b) Compare the structural components of flexible and rigid pavements. How do the construction materials and layer configurations differ between these two pavement types?	5M 5M	5	L2
	OR			
11	Assess the role of IRC guidelines in the design of flexible pavements. What are the benefits of following these standards, and how do they impact pavement performance and safety?	10M	5	L2