R22 Regulation *Subject code:4P5AA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

TRANSPORTATION ENGINEERING

(CE)

Maximum Marks: 60 Date:22.04.2026 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	BTL
1a)	Write two features of the Nagpur Road Plan	1M	1	L2
b)	What are the typical drawings prepared after highway surveys?	1M	1	L1
c)	Mention any two objectives of geometric design.	1M	2	L1
d)	List any two factors affecting the design of horizontal curves.	1M	2	L1
e)	Differentiate between spot speed and average speed	1M	3	L2
f)	List two human factors responsible for accidents.	1M	3	L1
g)	State the different types of traffic conflicts	1M	4	L1
h)	State any two objectives of channelization.	1M	4	L1
i)	List the different layers in a typical flexible pavement.	1M	5	L1
j)	What is the role of dowel bars in rigid pavements?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50 Marks)		Marks	CO	BTL
2	a) List out different road development plan in India? Explain any of two.	5M	1	L2
	b) What are the various requirements of an ideal highway alignment? Discuss briefly.	5M	1	L2
	OR			
3	a) How are roads classified in India? Explain each one of them in detail.	5M	1	L2
	b) Explain the necessity for carrying out highway planning.	5M	1	L2
4	a) Write the design process of horizontal and vertical alignment.	5M	2	L3
	b) Find the minimum sight distance to avoid head-on collision of two cars approaching at 90 kmph and 60kmph. Given t=2.5secs, f=0.7 and break efficiency of 50% in either case.	5M	2	L3
	OR			
5	a) Define super elevation and also derive an expression for super elevation.	5M	2	L3

	b) Calculate the length of transition curve using the following data. Design speed 65 kmph, radius of circular curve 220 m. Allowable rate of introduction of super elevation (pavement rotated about the centre line) is 1 in 150. Pavement width including extra widening 7.5 m.	5M	2	L3
6	a) Explain various factors to be considered during the design of traffic signal timings. b) Explain the IRC method of traffic signal design.	5M 5M	3 3	L2 L2
	OR			
7	a) What are the different methods of maintaining accident records? Briefly explain with neat sketches. b) Explain in brief the various causes of road accidents with preventive measures.	5M 5M	3 3	L2 L2
8	a) What is an intersection? Explain in detail, the two broad classifications of intersections. b) Discuss the traffic islands to be provided for intersection.	5M 5M	4 4	L2 L2
	OR			
9	a) Discuss the advantages and disadvantages of rotary intersections. b) Discuss the impact of geometric design on operational capacity and level of service.	5M 5M	4 4	L2 L2
10	a) Describe the components of Flexible pavements. b) Explain in brief various design principles to be adopted in Rigid pavement design.	5M 5M	5 5	L2 L2
	OR			
11	a) Briefly outline the advantages and limitations of rigid pavements. b) Demonstrate the design procedures of flexible pavement as per IRC 37-2012.	5M 5M	5 5	L2 L3