



R22 Regulation

Subject code: 4P5AA

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**B.Tech V Semester Regular/Supplementary Examinations, November 2025**

**TRANSPORTATION ENGINEERING**

(CE)

Maximum Marks: 60

Date: 10.11.2025

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.

Allow IRC 37 2012 DESIGN CHARTS

**Part-A**

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1a)	Why is long-term planning essential for highways?	1M	1	L3
b)	What is the Jayakar Committee and why is it significant?	1M	1	L1
c)	What do you understand by super elevation?	1M	2	L1
d)	What is an ideal transition curve?	1M	2	L1
e)	Define traffic volume	1M	3	L1
f)	Mention two main objectives of ITS.	1M	3	L1
g)	What is the width of carriageway at entry and exit of a rotary?	1M	4	L1
h)	How can conflicts be reduced at intersections?	1M	4	L3
i)	What are the requirements of a good pavement?	1M	5	L1
j)	What material is primarily used in rigid pavements?	1M	5	L1

**Part-B**

Answer All the following questions. (5X10M=50 Marks)		Marks	CO	Bloom Tx
2	a) Write a detailed note on various road network patterns available with neat sketches.	5M	1	L3
	b) Briefly outline the highway development in India.	5M	1	L2
OR				
3	a) Mention various factors affecting road alignment.	5M	1	L2
	b) What are the various drawings required to plan a highway effectively?	5M	1	L2
4	a) With neat sketches, describe the typical cross sections for single-lane, two-lane, and divided highways in India.	5M	2	L2
	b) Calculate the stopping sight distance for a design speed of 100 Kmph. Take the total reaction time 2.5 seconds and the coefficient of friction = 0.35.	5M	2	L3
OR				
5	a) What are the steps involved to design super elevation? Explain with a neat sketch.	5M	2	L2

	b) A valley curve is formed by a descending grade of 1 in 25 meeting an ascending grade of 1 in 30. Design the length of valley curve to fulfill both comfort condition and head light sight distance requirements for a design speed of 80 kmph. Assume allowable rate of change of centrifugal acceleration $C = 0.6 \text{ m/s}^3$ .	5M	2	L2
6	a) Explain the term Traffic Volume? What are the objectives of carrying out traffic Volume Studies? b) Classify the different types of traffic signs and mention the general objective of each type of sign. Explain them with neat sketches.	5M 5M	3 3	L2 L2
OR				
7	a) Explain briefly the principle of Webster's method of signal design. Mention the advantages of this method. b) Discuss in detail about various kinds of road markings.	5M 5M	3 3	L2 L2
8	a) State various advantages and disadvantages of grade separated intersections. b) Define traffic island. How the traffic islands are classified based on their function.	5M 5M	4 4	L2 L3
OR				
9	a) Explain in detail, the various design elements of rotary type of intersection based on IRC standards with neat sketches. b) Explain how geometric design affects the safety of intersections.	5M 5M	4 4	L2 L2
10	a) Write the design processes of IRC method for rigid pavements? b) What are the various layers in a flexible and rigid pavement? Explain the significance of each layer.	5M 5M	5 5	L3 L2
OR				
11	a) Draw the stress distribution and cross section in flexible pavements and rigid pavements. b) Design the flexible pavement as per IRC 37-2012 with the following data. Two-lane single carriageway Initial traffic=600CVPD. Traffic growth rate per annum=7.5percent. Design life=15 years. VDF=2.5, Design CBR of subgrade soil=4percent.	5M 5M	5 5	L3 L3