O.P.Code: 23CE0126 | R23 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular Examinations April-2026
HIGHWAY ENGINEERING
(Civil Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	What is the necessity of highway planning?	CO1	L1	2M
	b	What are different surveys involved in alignment of a highway?	CO1	L1	2M
	c	What is importance of a geometric design highway?	CO1	L1	2M
	d	Length and radius of transition curve are 52 m and 220 m respectively,find shift.	CO1	L2	2M
	e	Define traffic flow and density.	CO1	L1	2M
	f	What is condition diagram of an accident?	CO1	L1	2M
	g	List various traffic conflicts.	CO1	L1	2M
	h	What are classifications of intersections at-grade?	CO1	L2	2M
	i	What are pavement components in a flexible pavement?	CO1	L1	2M
	j	How to find out spacing between expansion joints in CC pavements?	CO1	L2	2M

PART-B
(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2		Explain highway development in India since 1927.	CO1	L2	10M

OR

3		What are obligatory points? How they affect highway alignment? Explain with sketches.	CO1	L2	10M

UNIT-II

4	a	Give step-by-step procedure to find the rate of super elevation at a horizontal curve of a highway.	CO2	L2	5M
	b	Find extra-widening required at a horizontal curve of radius 325 m on a 4-lane divided highway of rolling terrain and minimum design speed.	CO2	L3	5M

OR

5		A valley curve is formed by a descending grade of 1 in 25 meeting an ascending grade of 1 in 30. Design speed is 80 kmph, allowable rate of change of centrifugal acceleration C = 0.6 m/sec^3. Find the length of valley curve to fulfill comfort condition. Also find the length of valley curve for head light sight distance.	CO2	L3	10M

UNIT-III

6		What are the factors affecting capacity of a traffic lane on a highway? Explain.	CO3	L2	10M

OR

7		Draw a collision diagram including various symbols involved in an accident.	CO3	L2	10M

UNIT-IV

8		Draw neat sketch showing conflicts at an uncontrolled intersection with explanation. (cross roads, both roads 2-lane and two-way).	CO4	L2	10M

OR

9		How to find out capacity of the weaving section of a rotary intersection? Explain.	CO4	L2	

UNIT-V

10		Find Cumulative Standard Axles (CSA) for the following data: Traffic during survey = 3000 cvpd Average growth rate = 7.5 % per year Design life = 15 years VDF value = 2.5 Lane distribution factor = 0.75 It takes 3 years for completion of construction.	CO5	L3	

OR

11	a	Find the distance from apex of CC pavement corner to section of maximum stress along the corner bisector. Radius of contact area is 15 cm, pavement thickness is 18 cm, Modulus of elasticity of CC is 3 x 10^5 kg/cm^2, Modulus of subgrade reaction is 6 kg/cm^3 and Poisson's ratio of CC is 0.15.	CO6	L3	
	b	Find Equivalent radius of resisting section, given radius of contact area is 15cm and CC pavement of thickness 20 cm.	CO6	L3	

*** END ***