Code No. : 16141 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (Civil Engg.) VI-Semester Main & Backlog Examinations, May/June-2023
Highway Engineering

Time: **3 hours**

Max. Marks: **60**

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Classify the roads as per the Nagpur Road Plan?	2	1	1	1,6
2.	Define Camber and Right of way?	2	1	1	1
3.	What are the various methods of doing origin destination survey? How is the data presented?	2	1	2	1,6
4.	Define (a) Journey speed and (b) Running speed	2	1	2	1
5.	What are the pavement materials and state their specific usage in different layers of pavement?	2	1	3	1
6.	Distinguish Viscosity grade and penetration grade of bitumen?	2	1	3	1
7.	Distinguish between empirical and Mechanistic methods of pavement designs?	2	2	4	1
8.	What is the significance of providing a filter layer in flexible pavements?	2	3	4	1
9.	What are the temperature specifications of the bituminous mix in the construction of premix pavements	2	1	5	1
10.	What are the applications of tack coat and prime coat?	2	1	5	1

Part-B (5 × 8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO
11. a)	Detail the types of gradients used in road alignment and state the applicable factors to be considered for these gradients in alignment? Also, explain the factors to be considered in the highway alignment.	5	2	1	1,6,7
b)	Determine the available side friction factors for the given conditions: design speed = 90 km/h and design value of super elevation = 0.07.	3	4	1	2
12. a)	Briefly outline the significance of parking studies and accident studies. What are methods of conducting parking studies and how is the data presented	4	2	2	1,6
b)	Explain step by step procedure of IRC method of signal design.	4	4	2	1,2

			M	L	CO	PO
13.	a)	Enlist the tests conducted on bitumen and explain the significance of all bitumen tests	4	3	3	1,5
	b)	Explain how short range and long range aging performances of bitumen are determined?	4	3	3	1,5
14.	a)	Briefly write the salient features of the Flexible Pavement Design as per IRC:37 in main steps, describing with applicable sketches?	4	3	4	2
	b)	Draw the typical sketches showing critical combination of loading and temperature differential considered for design of concrete slab pavement by carrying out BUC and TDC Analyses, as per IRC:58?	4	2	4	2
15.	a)	Enlist the different types of distresses in flexible pavement and write their possible causes?	4	2	5	1,6
	b)	Explain the procedure adopted for construction of wet mix macadam with applicable quality requirements?	4	2	5	1,6
16.	a)	A summit curve is formed when an ascending gradient of 1 in 20 meets an ascending gradient of 1 in 60. If the value of SSD = 110 m. Calculate the total length of summit curve.	4	4	1	2
	b)	Draw general types and shapes of islands or channelization? Label their names and list out their functionality with reference to traffic flow and safety?	4	2	2	1
17.		Answer any *two* of the following:				
	a)	Write an overview on Marshall Mix design?	4	3	3	2
	b)	Write how pavement failure mechanism is related with critical strains in different layers of flexible pavement?	4	4	4	2
	c)	Write an overview on Recycled pavements? How does this lead to sustainable development?	4	2	5	1,6,7

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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