U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Civil Engineering **Duration: 3 hrs.**

Course Code: 23CV6PEPMC / 22CV6PEPMC **Max Marks: 100**

Course: Pavement Materials and Construction

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Discuss Rothfuch's method of blending aggregates for the preparation of bituminous mix with a neat sketch.	CO1	PO 1	**10**
	b)	Enumerate the desirable properties of aggregates along with IRC specifications and discuss the procedure of evaluating the crushing strength for selecting the aggregates in pavement construction.	CO1	PO1	**10**
		OR			
2	a)	Determine the proportion of each type of aggregates required to prepare the bituminous concrete mix by using four different materials by Rothfuch's method from the given data.	CO1	PO1, 2	**10**
	b)	Discuss the laboratory procedure of evaluating the toughness and resistance to wear and tear for selecting the aggregates in pavement construction.	CO1	PO1, 4	**10**

IS Sieve Size (mm)	Percentage passing				Desired Gradation		Obtained gradation
	20mm down	12mm down	6.3mm down	dust	upper limit	lower limit	
45	100	100	100	100	100	100	100.00
37.5	100	100	100	100	100	100	100.00
26.5	100	100	100	100	100	100	100.00
19	79.28	100	100	100	100	90	94.20
13.2	0	100	100	100	79	59	72.00
9.5	0	61.81	100	100	72	52	63.60
4.75	0	0	44.10	100	55	35	39.93
2.36	0	0	4.3	95.46	44	28	31.32
1.18	0	0	0	73.33	34	20	23.46
0.6	0	0	0	58.26	27	15	18.64
0.3	0	0	0	43.26	20	10	13.84
0.15	0	0	0	25.06	13	5	8.02
0.075	0	0	0	9.66	8	2	3.09

			UNIT - II			
	3	a)	Mention the IRC specifications for NRMB and PMB modified binders.	*CO1*	*PO1*	**10**
		b)	Classify Emulsions and Cutbacks and discuss their applications in road construction.	*CO1*	*PO1*	**10**
			OR			
	4	a)	Discuss the mechanism of stripping by immersion wheel tracking test as per IRC standards.	*CO1*	*PO1*	**10**
		b)	Discuss the separation test procedure for modified binders as per IRC standards.	*CO1*	*PO1*	**10**
			UNIT - III			
	5	a)	Enumerate the steps involved in the determination of OBC by Marshall Stability method as per IRC standards.	*CO2*	*PO1, 3*	**10**
		b)	Define SuperPave. List the advantages and disadvantages of SuperPave mix.	*CO2*	*PO1*	**10**
			OR			
	6	a)	Determine the Marshall properties for a 5.1 % bitumen sample having its height as 64.59mm, weight in air and water were 1259 g and 720 g respectively. The specific gravities of 20mm, 12mm, 6mm, Dust and Bitumen were 2.60, 2.58, 2.62, 2.62 and 1.01 respectively. The respective weights of aggregates only were 335, 265, 215 and 385 grams respectively.	*CO2*	*PO1, 3*	**10**
		b)	Discuss the requirements of a good bituminous mix.	*CO2*	*PO1*	**10**
			UNIT - IV			
	7	a)	Discuss the working principle of two grading equipment's in road construction with neat sketches.	*CO3*	*PO1*	**10**
		b)	Discuss the quality control tests on subgrade soil as per MoRT&H specifications.	*CO4*	*PO1*	**10**
			OR			
	8	a)	Discuss the working principle of two excavating equipment's in road construction with neat sketches.	*CO3*	*PO1*	**10**
		b)	Discuss the steps involved in the construction of embankment as per MoRT&H standards.	*CO4*	*PO1*	**10**
			UNIT - V			
	9	a)	Discuss the construction procedure for Bituminous Concrete mix as per MoRT&H specifications.	*CO4*	*PO1*	**10**
		b)	Discuss the construction procedure for Pavement Quality Concrete road construction as per MoRT&H specifications.	*CO4*	*PO1*	**10**
			OR			
	10	a)	Discuss the construction procedure for Water Bound Macadam Pavement as per MoRT&H specifications.	*CO4*	*PO1*	**10**
		b)	List the different joints in cement concrete pavement and discuss briefly with neat sketches.	*CO4*	*PO1*	**10**

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