Code No: P21CET03

HALL	TICKET	NUMBER
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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE (AUTONOMOUS) II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023 HIGHWAY ENGINEERING (CE Branch)

Time: 3 hours

Max. Marks: 70

Answer all the questions from each UNIT (5X14=70M)

Q.No.		Questions	Marks	CO	KL				
		UNIT-I							
1.	a)	Explain briefly main features of Indian Road Congress.	[7M]	1	2				
	b)	Write down the First, second, third road development plans, road development vision 2021.	[7M]	1	1				
OR									
2.	a)	Explain the role of engineering surveys in finalizing highway alignment	[7M]	1	2				
	b)	Discuss the general principles in the re-alignment of a highway and explain how the work is carried out?	[7M]	1	2				
		UNIT-II							
3.	a)	What are the various gradients used in highways? What do you understand by Grade compensation?	[7M]	2	2				
	b)	Calculate the stooping sight distance for a design speed of 105 kmph. Take the total reaction time 3 seconds and the coefficient of friction $=0.35$	[7M]	2	3				
	1	OR							
4.	a)	Derive an expression for finding the stopping sight distance at levels and at grades	[7M]	2	4				
	b)	What is the super elevation to be provided on a horizontal curve on a national highway in plain terrain (HINT: Design speed = 90 km/h), If the curve has a radius of 250 Meter?	[7M]	2	3				
	1	UNIT-III		I	I				
5.	a)	Explain origin and destination studies? What are the various uses of O&D studies?	[7M]	3	2				
	b)	A vehical skids through a distance equal to 435m before colliding with another parked vehicles, the weight of which is 75 percent of the former. After collision, if both the vehicles skid through 10m before stooping compute the initial speed of the moving vehicle. Assume friction coefficient of 0.63	[7M]	3	3				
		OR							
6.	a)	Explain the objectives of traffic planning and administration.	[7M]	3	2				
	b)	Show the conflict points at the intersection of the following types a) Cross- roads, both two ways b) Cross-Road, one way c) T-Intersection both two way d) Y-Intersection one way	[7M]	3	2				
		UNIT-IV		<u>.</u>					
7.	a)	What are the factors affecting bituminous mix design? Explain in detail.	[7M]	4	2				

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		The result of sieve analysis of a soil sample are given below				[7M]	4	3		
	b)	Seive Size (mm)	4.67	2.00	0.60	0.42	0.06			
		Percentage passing	70	40	15	10	0			
	1				OR					
8.	a)	What are the applications and limitations of shear bearing and penetration tests.				[7M]	4	2		
	b)	Explain the California Bearing Ratio test for finding bearing capacity of soil?					[7M]	4	2	
					UNIT-V					
9.	a)	Discuss the serviceability concept and traffic loads in the AASHTO design of flexible pavement.				[7M]	5	2		
	b)	Design a flexible pavement given R-value of sub grade soil=32, Traffic Index=11.5, C-Value of WBM base course =20 and C-Value of 7.5cm thick bituminous surfacing=65					[7M]	5	3	
	1	I			OR			II		
10.	a)	What are the types of pavements? Discuss in detail various factors affecting design of pavement.			[7M]	5	2			
	b)	Find the spacing between contraction joints for a 3.5m slab width having a thickness of 20cm for a) Plain concrete slab b)RCC slab. The allowable tensile stress values in concrete and steel are 0.8 and 1500Kg/m2. Coefficient of friction is 1.7.					[7M]	5	4	
