Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2721302 **Date: 09/12/2015**

Subject Name: Pavement Design, Construction and Evaluation

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	State with reasons in which conditions do you suggest rigid pavement for road construction?	**07**
	(b)	Differentiate between highway and runway in detail.	**07**
Q.2	**(a)**	Explain ESWL and EWLF concepts for pavement design.	**07**
	(b)	Describe with sketch (i) the relationship between tyre pressure and contact pressure, (ii) vertical stress distribution with depth- in pavement design.	**07**
		OR	
	(b)	How will you determine the elastic modulii of pavement materials?	**07**
Q.3	**(a)**	Explain with sketch CBR method of flexible pavement design.	**07**
	(b)	Compute the radius of relative stiffness and equivalent radius of resisting section of 22 cm thick cement concrete slab from the following data: E of Cement concrete = 2.1 x 10^5 kg/cm^2, Poissonôs ratio for concrete = 0.15, Modulus of subgrade reaction = 8 kg/cm^3, radius of contact area of wheel load = 15 cm.	**07**
		OR	
Q.3	**(a)**	Explain with sketch Marshall stability test for bituminous mix design.	**07**
	(b)	Design a suitable bituminous pavement section for a two-lane road with a Single carriageway. The traffic expected is 600 commercial vehicles per day in both directions with average vehicle damage factor of 1.8. Design subgrade CBR is 4 % and the assumed design life of the pavement is 10 years. Take lane distribution factor 0.75. Use Guidelines of IRC 37-2001.(See Fig.1 and Plate 1)	**07**
Q.4	**(a)**	Discuss with sketches effect of Temperature stresses in rigid pavements.	**07**
	(b)	Calculate the stresses at interior, edge and corner region of cement concrete pavement using Westergaardôs stress equations. Take wheel load = 5200 kg, Ec = 3 x 10^5 kg/cm^2 , Pavement thickness = 18 cm, μ = 0.15, Modulus of subgrade reaction K = 6 kg/cm^3, Radius of contact area = 16cm.	**07**
		OR	
Q.4	**(a)**	Explain Benkelman beam test with sketch.	**07**
	(b)	Describe with sketches Expansion joint and Contraction joint with dowel bar in CC pavement.	**07**
Q.5	**(a)**	Enlist various types of failures in flexible pavement. Describe any two with sketches stating its remedial measures.	**07**
	(b)	Explain with sketches different sub-surface drainage methods used in pavement construction.	**07**
		OR	
Q.5	**(a)**	Enlist various types of failures in rigid pavement. Describe any two with sketches stating its remedial measures.	**07**
	(b)	What do you understand by óPSIô and óPSRõ? Discuss their importance and evaluation procedure.	**07**

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