Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1721906 Date: 05-06-2013

Subject Name: Pavement Design and Analysis

Time: 10.30 am – 01.00 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)**	Using Burmisterôs approach, design a flexible pavement for 4080 kg wheel load for a tyre pressure of 6 kg/cm². The plate bearing test on subgrade soil and on 15 cm base course provided 1.5 kg/cm², 6 kg/cm² pressure respectively at 0.25 cm deflection.	**07**
	(b)	Using Mcleod method, design a flexible pavement for a wheel load of 4100 kg with a tyre pressure of 5 kg/cm². A 30 cm diameter plate in a plate load test yielded a pressure of 2.5 kg/cm² after 10 repetitions at 0.5 cm deflection.	**07**
Q.2	**(a)**	Determine the intensity of vertical pressure and horizontal shear stress at a point 4 metre directly below a 4 tonnes point load acting at a horizontal ground surface. What will be the value of vertical pressure and shear stress at a point 2 metre horizontally away from the axis of loading but at the same depth?	**07**
	(b)	State the points of difference between flexible and rigid pavement.	**07**
		OR	
	(b)	Plot a relation between a contact pressure and inflation pressure. Define and explain rigidity factors.	**07**
Q.3	**(a)**	Write a short note on ESAL	**07**
	(b)	Explain the terms radius of relative stiffness and radius of resisting section.	**07**
		OR	
Q.3	**(a)**	Discuss Westergaardôs concept of temperature stresses in concrete pavements.	**07**
	(b)	Discuss how the dimensions and spacing of tie bars are designs.	**07**
Q.4	**(a)**	Explain the necessity of design approach of flexible overlay over flexible pavement.	**07**
	(b)	State the objectives of strengthening of existing pavements and enlist the types of overlay.	**07**
		OR	
Q.4	**(a)**	Explain the principle and uses of Benkelman Beam test.	**07**
Q.4	**(b)**	Explain rigid overlay over flexible pavement.	**07**
Q.5	**(a)**	Explain the merits and demerits of SFRC pavement.	**07**
	(b)	Write a short note on load classification number method	**07**
		OR	
Q.5	**(a)**	Explain the critical combination of stresses in cement concrete pavements.	**07**
	(b)	Differentiate between structural and functional distress in pavements.	**07**

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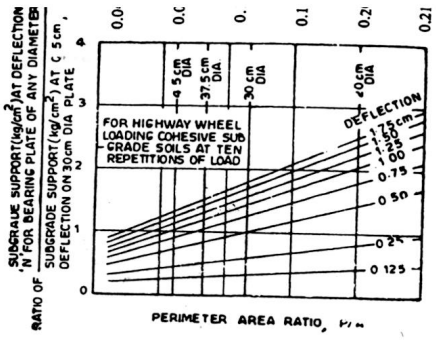

Fig. Relationship of Subgrade Support with P/A ratio

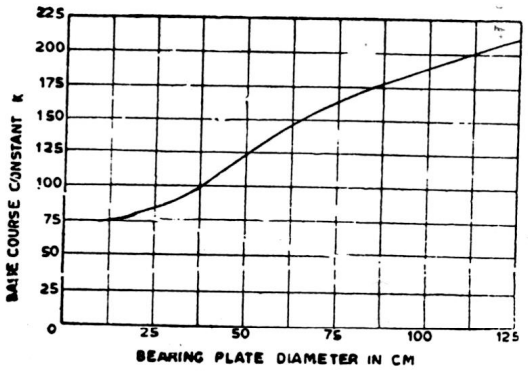

Fig. Relation between Plate Diameter and Base Course Constant

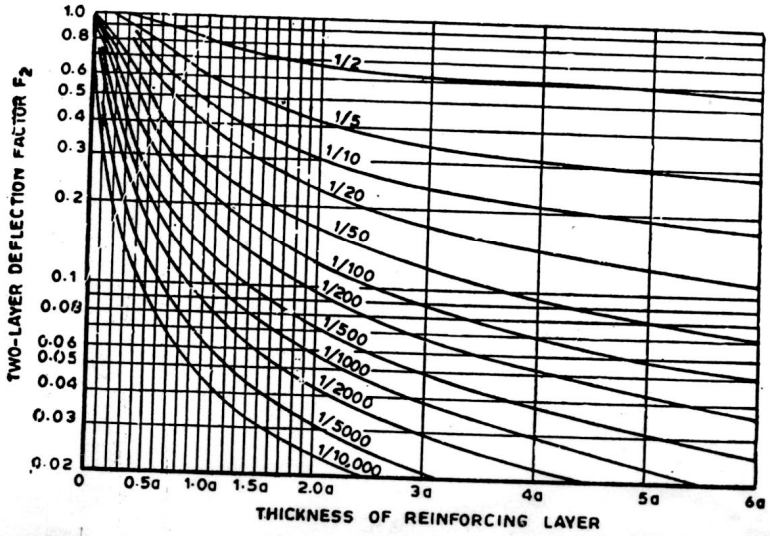

Fig. Relationship of F2 and h in a Two-lane System (Burmister's Method)