Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1721302 **Date:13/05/2015**

Subject Name: Pavement Design and Evaluation

Time: 02:30 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)** Draw the sketch showing the various layers in pavement and state the functions of each layer. **07**

(b) Explain various types of failures in rigid pavements. **07**

Q.2 **(a)** Using Boussinesqôs analysis, calculate the vertical stress beneath a circular tyre imprint at a depth of 37.5 cm for the following conditions **07**

Gross load on tyre = 20,000 kg

Tyre pressure = 7 kg/cm^2

Also determine the elastic deformation if the subgrade has a modulus of deformation of 56 kg/cm^2 and the thickness of pavement is 40 cm.

(b) Explain the Westergaardôs theory of rigid pavement **07**

OR

(b) Write a note on maintenance of flexible and rigid pavements. **07**

Q.3 **(a)** Write a short note on ñEquivalent Single Wheel Loadò **07**

(b) Calculate the equivalent C-value of a three layered pavement section having individual C-values as given below **07**

Materials	Thickness, cm	C-value
Bituminous Concrete	8	55
Cement treated base	18	215
Gravel sub-base	9	12

OR

Q.3 **(a)** Explain the field CBR test method **07**

(b) Calculate 12 year EWL and TI values using the following AADT data **07**

Number of Axle	AADT (Two directions)
2	3300
3	350
4	290
5	75

Assume 55 % increase in traffic in 12 year period.

Q.4 **(a)** Determine the thickness of a concrete pavement using Westergaardôs corner load formula to support a maximum wheel load of 4100 kg. Allow 10 % for impact and the tyre pressure is 5.5 kg/cm^2.The modulus of subgrade reaction is 5.5 kg/cm^3. The flexural strength of concrete is 40 kg/cm^2. Factor of safety is taken as 2. Also determine the distance from the corner at which the maximum stress occurs. **07**

(b) Explain the Indian Road Congress design method of rigid pavement. **07**

OR

Q.4 **(a)** Describe the design procedure for Continuously reinforced concrete pavements **07**

(b) Explain the criteria and steps for design of dowel bars **07**

Q.5	**(a)**	Enlist various methods of evaluation of pavement by deflection measurements and explain any one in detail.	**07**
	(b)	Describe various types of overlays	**07**

OR

Q.5	**(a)**	Write a note on Slope Profilometer	**07**
	(b)	Explain the fundamental concepts and uses of present serviceability index (PSI)	**07**

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