Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1721302 **Date: 31-12-2012**

Subject Name: Pavement Design and Evaluation

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)** Compare the Highway and Runway **07**

(b) Explain the following with sketch:- **07**

(i) Alligator Cracking

(ii) Frost Heaving

(iii) Shear Failure

Q.2 **(a)** Design the thickness of flexible pavement by Burmister's two layer method, for a wheel load of 50 KN and a tyre pressure of 0.5 MN/m^2. The modulus of elasticity of the pavement material is 180 MN/m^2 and of the sub grade is 40 MN/m^2. **07**

(b) Explain the Westergaard's approach of Rigid Pavement Design **07**

OR

(b) Write a short note on "ESWL" **07**

Q.3 **(a)** Calculate the 15- year EWL and TI values using the following AADT data **07**

Number of Axle	AADT (two direction)
2	4200
3	510
4	350
5	110

Assume 70 percent increase in 15 year period.

(b) Describe the California Bearing Ratio Method of Flexible pavement design **07**

OR

Q.3 **(a)** Calculate the equivalent C value of a three layered pavement section having individual C value as given below. **07**

Material	Thickness, cm	C value
Bituminous Concrete	12	65
Cement treated base	25	230
Gravel sub base	15	18

(b) What are the advantages and limitations of CBR method of design? **07**

Q.4 **(a)** Explain the need for joints in cement concrete pavement. What are the **07**

various types of joints? Explain with sketch.

(b) What are the factors affecting pavement design? Explain **07**

OR

Q.4 **(a)** Calculate the stresses at interior, edge and corner region of CC pavement using the Westergaard's equation from the following data **07**

Load – 6500 Kg,
Pavement thickness – 22 cm,
Poisson's ratio of concrete – 0.15,
Modulus of elasticity of concrete – 3×10^5 Kg / cm^2,
Modulus of subgrade reaction – 6 Kg / cm^3.
Radius of contact area – 18 cm

(b) Explain about the Pre stressed concrete pavement. **07**

Q.5 **(a)** What are the special repairs carried out in flexible pavement? Explain **07**

(b) What are the types of overlay? Explain any one in detail. **07**

OR

Q.5 **(a)** Explain the principle and uses of Benkleman Beam test. **07**

(b) Explain various types of maintenance works. **07**

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