Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –I Examination Feb. - 2012

Subject code: 711303N **Date: 17/02/2012**
Subject Name: Highway Materials and Construction
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)**	What are the factors affecting the compaction of soil?	**07**
	(b)	Describe the CBR test.	**07**
Q.2	**(a)**	Write a short note on 'Soil-Lime Stabilisation".	**07**
	(b)	Describe the techniques of soil stabilization using Calcium Chloride and Sodium Chloride.	**07**
		OR	
	(b)	Discuss the desirable properties of an aggregates used in highway construction.	**07**
Q.3	**(a)**	Explain the test procedure of Flackiness Index and Elongation Index. State its importance.	**07**
	(b)	Describe the test procedure of Penetration Value of bitumen.	**07**
		OR	
Q.3	**(a)**	What is tack coat? Give specification of tack coat.	**07**
	(b)	Describe the Marshal Method of design of asphaltic mixes.	**07**
Q.4	**(a)**	What are the defects commonly noticed in water-bound-macadam and What are the likely causes?	**07**
	(b)	Compare the rigid and flexible pavement system from various criteria.	**07**
		OR	
Q.4	**(a)**	Write a short note on "Geo-textiles".	**07**
	(b)	What are the methods available for protection of slopes of embankments against erosion?	**07**
Q.5	**(a)**	How are land-slides caused in hill roads and how they can be prevented?	**07**
	(b)	How the construction of road is carried out in swampy area?	**07**
		OR	
Q.5	**(a)**	The bulk specific gravities of coarse aggregate, fine aggregate, fines and bitumen are 2.80, 2.75, 2.60, 1.10 respectively. Their relative proportions are 60%, 25%, 10% and 5% respectively. The mass of sample measured in air is 1400 gm. The mass of paraffin coated sample in air is 1460 gm. The mass of the paraffin coated sample in water is measured as 750 gm. Calculate the specific gravity of the mix, VMA, VA, VFB and the percentage absorbed bitumen. The specific gravity of paraffin is 0.9 and the theoretical maximum specific gravity of the mix obtained from the vacuum test is 2.60.	**07**
	(b)	What are the advantages of emulsions?	**07**

****