

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Examination January 2010

Subject code: 711303

Subject Name: Highway Materials and Construction

Date: 25 / 01 / 2010

Time: 12.00 – 2.30 pm

Total Marks: 60

Instructions:

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

- Q.1** (a) 1. Describe classification of soil. 03
 2. Explain Compaction and consolidation of soil and its importance in road construction. 03

- (b) What is the importance of filler in bituminous mix? Which material is normally used as fine in bituminous mix? 06

- Q.2** (a) Draw Schematic phase diagram of volumetric mix and Explain VFB and VMA. State its importance. 06
 (b) Describe the Los Angeles Abrasion Test for the aggregate? Specify the limit of abrasion value for different types of pavement as per IRC. 06

OR

- (b) Describe the Impact Test for the aggregate? Specify the limit of Impact value for different types of pavement as per IRC. 06

- Q.3** (a) Explain the construction method for flexible pavement. State various precautions required to take for construction of flexible pavement. 06
 (b) Explain CBR test and state its importance. 06

OR

- Q.3** (a) What are the basic raw material for geo-synthetics and discuss about properties of geo-synthetics. 06
 (b) Explain Marshal stability method. 06

- Q.4** (a) A bitumen concrete mix contains 2250 kg of aggregate and 150 kg of bitumen per cubic meter. Bituminous absorption is 12%. The bulk relative density of aggregate is 2.67. Relative density of bitumen is 1.105. Draw the volumetric schematic diagram. Find volume of VFB, VMA, and VA. 06
 (b) Explain the construction method for rigid pavement. State various precautions required to take for construction of rigid pavement. 06

OR

- Q.4** (a) Find bitumen content, theoretical density, bulk density, air voids, and volume of bitumen, VMA, and VFB. Use detail given below 06

Material	Sp. Gravity	Wt. in Mix(g)
Bitumen	1.055	55
Coarse aggregate	2.9	665
Fine agg	2.965	401
Filler	1.63	80

- (b) State various methods for soil stabilization and explain any one. 06

- Q.5** (a) Describe importance of surface and sub surface drainage work for the roads. 06
 (b) Explain the difference between WBM and WMM? 06

OR

- Q.5** (a) Write note on surfacing and surface treatment for the bituminous roads. 06
 (b) Write note on the construction of roads on water logged area. 06
