

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER I (OLD) – • EXAMINATION – SUMMER 2016**

**Subject Code: 711303N**

**Date: 18/05/2016**

**Subject Name: Highway Materials and Construction**

**Time: 02:30 pm to 05:00 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 desirable properties of soil? How to determine soil properties? 07  
(b) Write following in brief:  
(i) Road work in Swampy area. 03  
(ii) Surface courses 04

- Q.2** (a) What is difference between compaction and consolidation? How compaction and consolidation is measured on site in field? 07  
(b) Explain flexible pavement construction with sketch. 07  
**OR**  
(b) Write following in brief:  
(i) Aggregate blending method. 04  
(ii) Problems in highway construction in hilly area. 03

- Q.3** (a) Explain rigid pavement construction with sketch. 07  
(b) Write following in brief:  
(i) Macadam construction. 04  
(ii) Highway surface treatment. 03

- OR**  
**Q.3** (a) What are the types of geotextile materials used in highway construction? 07  
(b) Write about working of hot mix plant with lay out. 07

- Q.4** (a) What are the types of bituminous materials? 07  
(b) Explain bitumen content test with aim, equipment name and procedure in detail. 07

- OR**  
**Q.4** (a) Explain soil cement stabilization method with design of mix. 07  
(b) Explain stripping value test with aim, procedure, chemicals required for testing. 07

- Q.5** (a) Explain subsurface drainage with sketch. 07  
(b) Write minimum value recommended for accepting the material for highway construction for following tests. 07  
1. Ductility test  
2. Impact test  
3. Abrasion test  
4. Shape test  
5. Water absorption test  
6. Specific gravity test for coarse aggregate  
7. Specific gravity test for bitumen

**OR**

**Q.5 (a)** Write name of apparatus and aim of the test for following tests. **07**

1. Abrasion test
2. Penetration test
3. Softening point test
4. Impact test

**(b)** Explain surface drainage with need and sketch. **07**