## GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER-1 (OLD) EXAMINATION - WINTER 2016

Subject Code: 711303N Date:19/11/2016

**Subject Name: Highway Material and Construction** 

Time: 10:30 Am to 1:00 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) Explain Indian soil classification system. 07
  - (b) What are the factors affecting the compaction of soil?
- **O.2** (a) What are the purposes of soil stabilization?
  - (b) Write a short note on "Mechanical Soil Stabilization" 07

OR

- (b) What are the advantages and disadvantages of soil cement stabilization? 07
- **Q.3** (a) What are the desirable properties of good aggregates?
  - (b) Explain- Flakiness index and elongation index tests of aggregate. 07

OR

- Q.3 (a) What is objective of impact test for aggregate? Explain the procedure of impact test.
  - (b) Enlist the tests for bitumen. Explain penetration test of bitumen with sketch 07
- Q.4 (a) A specimen of asphaltic concrete has a height of 6.20 cm and a diameter of 10.16 cm. The weight of the compacted specimen (uncoated) in air is 1174.4 gms and in water the weight is 668.4 gms. When coated with paraffin, its weight in air is 1220.9 gms and its weight when immersed in water is 664.4 gms. The specific gravity of paraffin is 0.90. The analysis of the specimen yielded the following

Aggregates Mix composition Composition (% Specific Material (% by weight of by weight of total Gravity total mix) aggregates) 1.02 Asphaltic 6 2.58 52 Coarse Aggregates 55.3 Fine Aggregates 2.75 34.6 36.8 Mineral Filler 2.70 7.4 7.9

## Calculate:

- (a) Average specific gravity
- (b) Maximum theoretical density
- (c) Bulk density of specimen by uncoated specimen immersed in water
- (b) Write a short note on "Marshal Stability Test"

OR

- Q.4 (a) Explain the construction procedure of sub-base and base of flexible pavement. 07
  - (b) What are the methods of achieving good highway drainage? 07
- Q.5 (a) Write a short note on "catch-water drain" 07
  - b) Write the procedure of California Bearing Ratio (CBR) test 07

OR

- Q.5 (a) What are the guidelines to be observed in designing roads in desert region? 07
  - (b) How roads are constructed in swampy area? 07

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**07** 

07