| Seat No.: Enrolment No         |  |   |           |
|--------------------------------|--|---|-----------|
|                                |  | GUJARAT TECHNOLOGICAL UNIVERSITY  |           |
|                                |  | ME SEMESTER-1 EXAMINATION - WINTER • 2014   |           |
| Subject Code: 711303N Date: 03 |  | 3-12-2014   |           |
| Sub                            | ject                                   | Name: Highway Material and Construction   |           |
|                                | Time: 10:30 am - 01:00 pm Total Marks: |   |           |
|                                | uction                                 | •   |           |
|                                |  | Attempt all questions.  |           |
|                                |  | Make suitable assumptions wherever necessary.   |           |
|                                | 3.                                     | Figures to the right indicate full marks.   |           |
| Q.1                            | (a)                                    | Compare surface area concept and void ratio concept for bituminous concrete   | 07        |
|                                |  | mix design for Pavement?  |           |
|                                | <b>(b)</b>                             | Explain Marshall method for mix design of Bituminous Concrete?  | <b>07</b> |
| <b>Q.2</b>                     | (a)                                    | VA  | <b>07</b> |
|                                |  | performance of bituminous Pavement.   |           |
|                                | <b>(b)</b>                             | What is meant by Penetration grade & viscous grade for bitumen? Which one is currently considered for pavement design? Why? | 07        |
|                                |  | OR  |           |
|                                | <b>(b)</b>                             | List the test conducted on bitumen to check its suitability for pavement  | <b>07</b> |
|                                |  | construction? Also discuss the importance of each test?   |           |
| Q.3                            | (a)                                    |   | 07        |
|                                | <i>a</i> >                             | bitumen?  | 0.7       |
|                                | <b>(b)</b>                             | · · · · · · · · · · · · · · · · · · ·   | 07        |
| 0.3                            | (a)                                    | OR  Explain the test on hitumen to evaluate the visce electic behavior of hitumen &   | 07        |
| Q.3                            | (a)                                    | Explain the test on bitumen to evaluate the visco elastic behavior of bitumen & asphalts?                                   | U /       |
|                                | (b)                                    |   | 07        |
|                                | (0)                                    | evaluating the conditions of various Pavement layers.   | 07        |
| Q.4                            | (a)                                    |   | 07        |
|                                | ()                                     | construction? Discuss about their permissible limits to be suitable for highway   |           |
|                                |  | construction as suggested by IRC.   |           |
|                                | <b>(b)</b>                             | List various kind of rollers used in road construction? Explain why and under   | 07        |
|                                |  | what conditions they are used?  |           |
|                                |  | OR  |           |
| <b>Q.4</b>                     | (a)                                    | Write a note on hot mix plant.  | <b>07</b> |
|                                | <b>(b)</b>                             | Explain laboratory test procedure to determine optimum moisture content for compaction of road sub grade?                   | 07        |
| Q.5                            | (a)                                    | Explain the procedure for designing road side drains?   | 07        |

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Q.5 (a) Discuss soil stabilization technique using geotextile & stone piles in marshy 07

discuss about its advantages & disadvantages?

OR

land for construction of road embankment?

construction?

(b) Explain how geotextile contribute in construction of bridge abutments? Also 07

(b) What is CBR Value? How is it determined? What is its significance in road 07