



## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Second Semester, M. Tech - Civil Engineering (MCAD)

Semester End Examination; June - 2016

### Ground Improvement Techniques

Time: 3 hrs

Max. Marks: 100

**Note:** i) Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.

ii) Assume missing data if any.

#### UNIT - I

- |   |    |  |    |
|---|----|--|----|
| 1 | a. | Explain the classification of different ground modification techniques based on mechanism. | 10 |
|   | b. | Explain the factors to be considered during compaction in the field.                       | 10 |
| 2 | a. | Define degree of compaction. Explain the challenges faced during field compaction.         | 10 |
|   | b. | Explain the effect of compaction on engineering properties of soil.                        | 10 |

#### UNIT - II

- |   |    |   |    |
|---|----|---|----|
| 3 | a. | Explain any two methods of lowering ground water table.                   | 10 |
|   | b. | Discuss the principles and advantages of ground improvement by ;          | 10 |
|   |    | i) Preloading                  ii) Electro osmosis.                       | 10 |
| 4 | a. | What are the factors to be considered in the design of dewatering system? | 10 |
|   | b. | Discuss the principles and advantages of ground improvement by ;          | 10 |
|   |    | i) Sand drain                  ii) Electro kinetic dewatering.            | 10 |

#### UNIT - III

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|---|----|--|----|
| 5 | a. | Explain the mechanism, suitability, process and limitations of stabilization with cement.  | 10 |
|   | b. | Explain the mechanism, suitability, process and limitations of stabilization with fly ash. | 10 |
| 6 | a. | Explain the mechanism, suitability, process and limitations of stabilization with lime.    | 10 |
|   | b. | Explain the mechanism, stability, process and limitations with asphalt.                    | 10 |

#### UNIT - IV

- |   |    |   |    |
|---|----|---|----|
| 7 | a. | Discuss the factors to be considered for providing grout curtain below a dam. | 10 |
|   | b. | Distinguish between compaction grout and displacement grout.                  | 10 |
| 8 | a. | Briefly explain the mechanism and usefulness of ;                             | 10 |
|   |    | i) Rock anchors          ii) Rock bolts.                                      | 10 |
|   | b. | Explain different types of grouting.  | 10 |

#### UNIT - V

- |    |    |   |    |
|----|----|---|----|
| 9  | a. | Explain the different engineering properties of geosynthetics necessary for improving ground using geosynthetics. | 10 |
|    | b. | Discuss the functions of geosynthetics.   | 10 |
| 10 | a. | Explain the mechanism, construction, procedure and advantages of soil nails.                                      | 10 |
|    | b. | Explain the test to be carried out for assessing the suitability of geosynthetics.                                | 10 |