Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020 (ONLINE MODE)

Course: Ground Improvement Techniques **Semester: VIII**
Program: B Tech Civil Engineering **Time 03 hrs.**
Course Code: CEEG 361 **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Fill the blanks a. For cementation as mechanism of improvement_____ is used as an additive to soil. b. For cation exchange as a mechanism of improvement, _____ is used as an additive to soil. c. For void filling as a mechanism of improvement____ is used as an additive to soil. d. For coating as a mechanism of improvement _____ is used as an additive to soil. e. If new soil is replaced as a method of improvement, it is termed as_____.	**5**	**CO1**
Q 2	a. Vibro floatation is an effective technique for _____ soils. b. The stone column technique is suitable for _____ soils. c. Rollers are the construction equipment used for the _____ of soil. d. Vibration is to reduce the _____ voids and to cause densification of granular soils. e. Smooth wheel roller has no _____attached with the drum.	**5**	**CO2**
Q 3	a. The grout materials are classified as _____, _____&_____. (3 marks) b. Examples of vertical drains are _____ and _____ types. (2marks)	**5**	**CO3**
Q 4	a. Geotextile related products with large rectangular apertures are called _____. b. For open areas of water such as dam lining and canals, these are used as protection measures i. Geo grids ii. Geo filters iii. Geo membrane	**5**	**CO4**

	iv. Geo synthetic c. Geo membranes are manufactured from i. Synthetic materials ii. Bituminous products iii. Both d. _____is a process of retaining soil by the incorporation of a large number reinforcement in the form of nails. e. Reinforcement provides _____ strength to the soil mass.		
Q 5	The objective of Ground improvement is increasing the _____, _____, _____, _____ and _____.	**5**	**CO1**
Q 6	Roller working principle is based on _____, _____, _____ and by applying _____ pressure on the respective _____.	**5**	**CO2**
SECTION B			
Q 7	Classify Ground improvement Techniques and comment on their applicability to sandy soil.	**10**	**CO1**
Q 8	Explain the steps of dynamic compaction.	**10**	**CO2**
Q 9	Interpret the merits and demerits of Reinforced Soil.	**10**	**CO3**
Q 10	Differentiate between three functions of geosynthetics, separation, drainage and filtration.	**10**	**CO4**
Q 11	Describe the use of TAM pipe in compensation grouting (OR) Explain the applicability of grouting techniques.	**10**	**CO3**
SECTION-C			
Q 12	a. A soft clay deposit is to be improved by replacing with 25-30 % strong material like gravel. Select a suitable ground improvement technique to achieve it and describe it. (10 marks) b. Select from the different types of geosynthetics available (one or more) with the following properties individually, for those areas where a Geotechnical Engineer intends to achieve in various locations of his site. • High Tensile load • High Tensile extension • High Puncture resistance • Low puncture displacement • Low permeability	**5+5+10**	**CO1, CO2, CO4**