



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**

Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Ground Improvement Techniques (16CE146) **Course & Branch:** B.Tech & CE
Year & Sem: IV-B.Tech & II-Sem **Regulation:** R16

UNIT –I

DEWATERING & GROUTING

1	What is dewatering? Explain its importance in civil engineering works.	[L1][CO1]	[12M]
2	List various well point dewatering systems and explain their suitability for different soils.	[L1][CO1]	[12M]
3	What are the objectives of dewatering? What are the types of foundation drains?	[L1][CO1]	[12M]
4	Explain the electro osmosis method to control ground water in low permeable soil?	[L2][CO1]	[12M]
5	What is grouting? Explain in detail various field of applications of grouting.	[L1][CO1]	[12M]
6	Explain compaction grouting, penetration grouting and fracture grouting with neat sketches.	[L2][CO1]	[12M]
7	Explain the following grouting methods: (i) Compaction grouting (ii) Jet grouting	[L2][CO1]	[12M]
8	Discuss in detail with suitable examples the field conditions which necessitate dewatering in soil.	[L2][CO1]	[12M]
9	Discuss in details various well point techniques for dewatering soils. Explain the criteria for the selection of a particular fill material around the drains.	[L2][CO1]	[12M]
10	Explain briefly various methods of grouting.	[L2][CO1]	[12M]

UNIT –II**DENSIFICATION METHODS IN GRANULAR SOILS & COHESIVE SOILS**

1	Discuss the principles of ground improvement in cohesion less soils.	[L2][CO2]	[12M]
2	Discuss the effectiveness of both vibro flotation and compaction piles for compacting the granular soils.	[L2][CO2]	[12M]
3	(a) What are the objectives of dewatering? What are the types of foundation drains?	[L2][CO2]	[6M]
	(b) Discuss how the stress history of a soil deposit affects its suitability for preloading with vertical drains.	[L2][CO2]	[6M]
4	(a) Compare vibratory probe compaction and dynamic compaction.	[L2][CO2]	[6M]
	(b) Explain the vibro compaction method for cohesionless soils.	[L2][CO2]	[6M]
5	(a) Explain with a neat sketch sand drain to accelerate the drainage of impervious soils.	[L2][CO2]	[6M]
	(b) What are the advantages of using wick geo drains?	[L1][CO2]	[6M]
6	(a) Discuss the need of ground improvement and write the principles of ground improvement in cohesionless soils	[L2][CO2]	[6M]
	(b) Briefly explain about methods of impact at ground surface and at depth used in densification of granular soil deposits.	[L1][CO2]	[6M]
7	(a) Write short notes on densification of cohesive soils by Lime columns.	[L1][CO2]	[6M]
	(b) Discuss the important formulae used in the improvement of soft clay deposits using stone columns.	[L2][CO2]	[6M]
8	(a) Explain briefly with a neat sketch the vibro compaction method of densifying deep granular deposits.	[L2][CO2]	[6M]
	(b) Explain the impact at ground surface method to densify granular soils.	[L2][CO2]	[6M]
9	(a) Explain in detail the in-situ densification of cohesive soils by using pre-loading with vertical drains.	[L2][CO2]	[6M]
	(b) What is a sand drain? How is it constructed and is useful in densifying cohesive soil deposits?	[L1][CO2]	[6M]
10	Explain various in-situ densification methods for cohesive soils.	[L2][CO2]	[12M]

UNIT –III
STABILISATION

1	What are the different chemicals used in stabilization of soil?	[L1][CO3]	[12M]
2	(a) Discuss on suitability and applications of lime stabilization.	[L2][CO3]	[6M]
	(b) Explain the proportioning techniques of mechanical soil stabilization.	[L2][CO3]	[6M]
3	Describe a method suitable to stabilize a highway foundation in a hilly terrain with high rainfall data.	[L1][CO3]	[12M]
4	Write a short note on: (i) Sodium silicate stabilization. (ii) Gypsum stabilization	[L2][CO3]	[12M]
5	Discuss the gradation limits for soil-cement stabilization and explain its construction procedure.	[L2][CO3]	[12M]
6	(a) What are the factors affecting mechanical stabilized soil properties?	[L1][CO3]	[6M]
	(b) Explain the mechanics of soil stabilization.	[L2][CO3]	[6M]
7	Write short notes on the following: (a) Bituminous stabilization. (b) Mechanical stabilization.	[L2][CO3]	[12M]
8	Describe the properties of calcium chloride that are beneficial in stabilization of soils?	[L1][CO3]	[12M]
9	Explain soil-lime reactions. What are the engineering benefits of lime stabilization of soils?	[L2][CO3]	[12M]
10	(a) What is the necessity of soil stabilization?	[L1][CO3]	[6M]
	(b) Explain mechanical methods of soil stabilization. What are the different types test for soil stabilization?	[L2][CO3]	[6M]

UNIT –IV**REINFORCED EARTH & GEOSYNTHETICS**

1	(a) Write the advantages and applications of reinforced earth structures with neat sketches.	[L2][CO4]	[6M]
	(b) Discuss the external stability aspects in the design of reinforced earth wall.	[L2][CO4]	[6M]
2	(a) What is the main difference between geo-grid and geo-textile? Explain the field applications of geo-grid and geo-textiles.	[L2][CO4]	[6M]
	(b) Explain separation and filtration functions of geo-textile. Mention applications based on these functions.	[L2][CO4]	[6M]
3	(a) What is the objective of soil reinforcement?	[L2][CO4]	[6M]
	(b) What are the factors governing the design of reinforced earth walls?	[L2][CO4]	[6M]
4	(a) What are geomembranes? How geomembranes differ from geo textiles?	[L2][CO4]	[6M]
	(b) What are the applications of geotextiles?	[L2][CO4]	[6M]
5	(a) What are geotextiles? Write a note on common nomenclature of geosynthetics.	[L2][CO4]	[6M]
	(b) Explain with suitable examples the principles involved in geo-textile material as reinforcement for improving the bearing capacity of soil.	[L2][CO4]	[6M]
6	(a) Explain any four engineering applications of reinforced earth with sketches	[L2][CO4]	[6M]
	(b) Describe the procedure of designing a reinforced earth wall.	[L2][CO4]	[6M]
7	(a) Distinguish between geo textiles and geo grids.	[L2][CO4]	[6M]
	(b) Explain the applications of geo-textiles based on their separation and drainage functions.	[L2][CO4]	[6M]
8	(a) Distinguish between woven and non woven geotextiles. How they are manufacture and what functions they can perform?	[L2][CO4]	[6M]
	(b) What is a geo-grid? Explain different types of geo grids. How do they differ from geotextiles functionally?	[L2][CO4]	[6M]
9	(a) What is reinforced earth? How does it differ from reinforced cement concrete and mechanically stabilized soil?	[L2][CO4]	[6M]
	(b) With a neat sketch explain the various components of reinforced earth structure.	[L2][CO4]	[6M]
10	(a) Explain clearly the functions of Geotextiles.	[L2][CO4]	[6M]
	(b) Compare geotextiles and geomembrane.	[L2][CO4]	[6M]

UNIT –V
EXPANSIVE SOILS

1	What is meant by expansive soils? What are the problems associated with expansive soils.	[L1][CO5]	[12M]
2	Give a detail discussion about various tests used for identification of expansive soils.	[L2][CO5]	[12M]
3	Explain briefly about improvement of expansive soils?	[L2][CO5]	[12M]
4	Discuss briefly about Consolidometer method with neat sketch.	[L2][CO5]	[12M]
5	What are the various foundation techniques adopted in expansive soils.	[L1][CO5]	[12M]
6	Explain briefly about under reamed piles and its applications.	[L2][CO5]	[12M]
7	Explain the following methods used for determination of swell pressure: (i) Consolidometer method (ii) Constant volume method	[L2][CO5]	[12M]
8	Discuss in detail about construction of under reamed pile and its advantages.	[L2][CO5]	[12M]
9	Write a short note on: (i) Granular fill (ii) Drilled piers	[L1][CO5]	[12M]
10	Explain briefly about CNS technology with neat sketch which is used as foundation technique.	[L2][CO5]	[12M]

Prepared by:
Mr. B. RAJASEKHAR REDDY
Assistant Professor/CE