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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, May – 2021

(Eighth Semester)

BCEPE8021 – GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 2 hrs

Maximum: 50 Marks

Answer ALL Questions**The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)****Q.1. Answer ALL questions**

- a. The fine grained cohesive soils can be stabilised by
- | | |
|-----------------------|-----------------------------|
| (i) well point system | (ii) ditches and sumps |
| (iii) vacuum method | (iv) electro-osmosis method |
- b. The important factors that governs the engineering behaviour of soil are
- | | |
|------------------------|---------------------------------|
| (i) Densification | (ii) Stabilisation |
| (iii) Tensile strength | (iv) Particle size distribution |
- c. Example of modification of soil property with the help of admixtures is
- | | |
|--------------------------------|---------------------------------|
| (i) Compaction | (ii) Drainage |
| (iii) Mechanical stabilisation | (iv) Particle size distribution |
- d. The properties of soil that are affected by compaction are
- | | |
|--------------------|---------------------------|
| (i) Swelling | (ii) Water absorption |
| (iii) Permeability | (iv) All of the mentioned |
- e. In cohesive soil, methods of stabilization applicable is
- | | |
|------------------|--------------------|
| (i) Compaction. | (ii) Stone column. |
| (iii) Vibration. | (iv) Blasting. |
- f. The properties of a soil under compaction depend upon
- | | |
|---------------------|--------------------------|
| (i) Swelling | (ii) Placement condition |
| (iii) Water content | (iv) Permeability |
- g. The essential feature of reinforced earth is that _____ develops between compacted layer of earth and reinforcing elements.
- | | |
|-------------------|--------------|
| (i) friction | (ii) tension |
| (iii) compression | (iv) shear |
- h. In general, the reinforced earth structures are
- | | |
|--------------|------------|
| (i) flexible | (ii) stiff |
| (iii) rigid | (iv) firm |
- i. Geosynthetics includes _____ main product categories.
- | | |
|---------|---------|
| (i) 6 | (ii) 8 |
| (iii) 9 | (iv) 10 |
- j. Mechanical stabilisation of soil involves which of the following operation?
- | | |
|---|---------------------------|
| (i) Compaction and Changing the composition of soil | (ii) Levelling |
| (iii) None of the mentioned | (iv) All of the mentioned |

PART – B: (Short Answer Questions)

(2 x 5 = 10 Marks)

Q.2. Answer ALL questions

- a. What is the necessity of ground improvement?
- b. Define compaction?
- c. What is compactive effort?
- d. What is soil stabilisation?
- e. Differentiate between reinforcement of soil and reinforcement of concrete?

PART – C: (Long Answer Questions)

(6 x 5 = 30 Marks)

Answer ANY FIVE questions

Marks

3. Explain various ground improvement techniques? (6)
4. Describe de-watering by electro osmosis? (6)
5. Elucidate principles of compaction? (6)
6. As per the compaction specification, a highway fill has to be compacted to 95% of standard proctor compaction test density. A borrow area available near the project site has a dry density of 1.65gm/cm^3 at 100% compaction and a natural void ratio of 0.61. The specific gravity of soil solids is 2.65. Compute the volume of borrow material needed to construct a highway fill of high 5m and length 1km with side slopes of 1:1.5, the top width of the fill is 8m. (6)
7. Clearly specify about fly ash stabilisation? (6)
8. Categorize the principle of reinforced soil? (6)
9. What are the characteristics of geo-synthetics? (6)
10. What are the applications of geo-textiles and geo-membranes? (6)

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