

**320745(20)**

**B. E. (Seventh Semester) Examination,**

**April-May 2020/NOV-DEC 2020**

**(New Scheme)**

**(Civil Engg. Branch)**

**EXPANSIVE SOILS**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Attempt all questions. Part (a) of each unit is compulsory and carries 2 marks. Answer any two parts ( $2 \times 7 = 14$  marks each) out of three from (b), (c) and (d).***

**Unit-I**

1. (a) What is expansive soil?

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- (b) Explain X-ray diffraction method for identification of expansive soil.
- (c) What do you mean by differential thermal analysis?
- (d) How expansive soil form in the field? Explain.

### Unit-II

- 2. (a) What are the characteristics of expansive soil?
- (b) Explain clay mineralogy of expansive soil.
- (c) Write short notes on :
  - (i) Clay water relation
  - (ii) Electrolysis process
- (d) What is the difference between atomic bond and molecular bonds of expansive soil?

### Unit-III

- 3. (a) What is the chemical composition of black cotton soil?
- (b) What are the techniques adopted for construction in black cotton soil?
- (c) Write short notes on :

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- (i) Swelling potential
- (ii) Mechanism of volume change
- (d) Describe modern method of construction in under reamed coil.

### Unit-IV

- 4. (a) What do you mean by stabilization?
- (b) Write short notes on :
  - (i) Stabilization of expansive soil with slag
  - (ii) Stabilization of expansive soil with lime
- (c) What is reinforced earth technique?
- (d) Explain grouting and soil nailing

### Unit-V

- 5. (a) What are the factors affecting the expansive oil.
- (b) What is the method of assessment for liquefaction?
- (c) Explain expansive soil model of bingham fluid bounded by porous beds.
- (d) How consolidation of marine clay deposits takes place. Explain.