Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (Civil Engineering) (2012 to 2017) (Sem.–7,8)

EARTH AND EARTH RETAINING STRUCTURES

Subject Code : BTCE-812

M.Code : 71871

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Q1. Answer briefly :

a. Zoned Dam

b. Downstream slope protection measures

c. Instruments to measure stress in earth dam and its foundation

d. Assumptions in Coulomb's theory of earth pressure

e. Stability checks in gravity retaining walls

f. Influence of wall friction on passive earth pressure

g. Stability checks in coffer dam

h. Differentiate between rigid and flexible retaining structures

i. Types of Diaphragm walls

j. Pressure diagram on cantilever sheet pile embedded in cohesive soils

SECTION-B

Q2. What are the basic design studies necessary for design of a earth dam?

Q3. Discuss in detail the Terzgahi's filter criteria for its design.

Q4. For a layered backfill behind a 10m high retaining wall with a smooth vertical backfill, Draw the active earth pressure distribution and its magnitude and point of application :

S. No.	Depth	Backfill properties
1.	0-3 m	$c = 30kN/m^2$, $\Phi = 0°$, $\gamma = 19kN/m^3$
2.	3-6m	$c = 0kN/m^2$, $\Phi = 32°$, $\gamma = 18kN/m^3$
3.	6-10m	$c = 50kN/m^2$, $\Phi = 0°$, $\gamma = 17kN/m^3$

Q5. A trapezoidal masonry retaining wall 1.5m wide at the top and 5m wide at its bottom is 5m high. The vertical face is retaining soil ($\Phi = 30°$) at a surcharge angle of 15° with the horizontal. Unit weights of soil and masonry are $20kN/m^3$ and $24kN/m^3$.The coefficient of friction at the base of the wall is 0.40. Check the stability of the retaining by applying necessary checks if the soil bearing capacity is $90kN/m^2$.

Q6 The height of cantilever sheet pile from the top of dredge level is 8m. The water level in the backfill is at 1m from top. Find the depth of penetration for a factor of safety equal to 1. Assume that above the water table, the soil is dry. The other properties of soil are : $\Phi = 32°$, saturated unit weight $20kN/m^3$, G = 2.65.

SECTION-C

Q7. The retaining wall having 6m height having back of wall is inclined at +ve batter angle of 15° and ground surface has an upward inclination of 20° retains a backfill with following properties : $\gamma = 19kN/m^3$, $\Phi = 34°$, $\delta = 20°$.

(a) Determine the total active thrust by Rebann's graphical construction.

(b) A surcharge of $50kN/m^2$ is acting on the backfill. What is the magnitude of total active thrust?

Q8. A braced cut 3m wide 6m deep is proposed in moist sajid with $\phi = 38°$. Sketch the suitable scheme of sheeting , bracing and also determine the maximum sheet load. Assume the density of soil as $18kN/m^3$.

Q9. What are different types of Coffer dams? Discuss in detail the step by step procedure for design of a diaphragm type coffer dam.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.