

GATE 2024 Question Paper Feb 4 (Civil Engineering - Slot 1)

Ques 1. A soil sample was consolidated at a cell pressure of 10 K Pa for 24 hours during a cu test. The cell pressure increases to 30. Now it results in a core water pressure increment of 1 K Pa. Soil failed when the agsist test gradually increased to 50 K Pa. Core water pressure at failure was recorded as 21 K Pa. What is the scamton core water pressure B?

Ans. 0.05

Ques 2. Soil = 0.75

G = 2.68

Water content = 17%

$\gamma_w = 10 \text{ kg n /m}^3$

$\gamma_d = ?$

Ans. $\gamma_d = 16.67 \text{ n/m}^3$

Ques 3. Is this incompressible or irrotational?

$V = 3\hat{i} + 5x\hat{j}$

Ans. Incompressible

Ques 4. Number of degree of freedom for mobile for natural open channel flow (OCF)

Ans. 4

Ques 5. Balanced section is there if the material is in other sections are same and dimensions same for which case section becomes under enforce?

- A. Area of compression steel is increased**
- B. Area of tension steel is decreased**
- C. Area of compression steel is decreased**
- D. Area of tension steel is increased**

Ans. A and B

Ques 6. Find the value of ϕ for critical stability. Beta β was given as 30° , γ set is given as 20, $\gamma_w = 10$. Find ϕ minimum for stability?

Ans. 49.1°

Ques 7. H_0 soil thickness is 10 m and final settlement is 50 mm = total primary consolidation settlement. After 300 days settlement is 10 mm. Additional time for 50% primary consolidation settlement?

Ans. 1875 Days

Ques 8. You have to tell the number of degrees of freedom for a natural open channel flow with a mobile bed?

Ans. 4 degrees of freedom

Ques 9. Find the value of x
3, 7, 15, x, 63, 127, 255

Ans. 31

Ques 10. What is the relationship between P & Q?
 $(P/Q)^{P/Q} = P^{(P/Q-1)}$

Ans. $Q^P = P^Q$

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