



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

**Paper Code : CE-501
FOUNDATION ENGINEERING**

Full Marks: 70

Time Allotted: 3 Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

Group - A

(Multiple Choice Type Questions)

✓ Choose the correct alternative for any ten of the following:

✓ (i) For soil exploration in a hard rocky stratum the Boring method to be used is

- (a) Auger Boring
(c) Wash Boring

- (b) Wash Boring
(d) Percussion Boring

✓ (ii) The Sampler used in SPT is

- (a) Piston Sampler
(c) Thin walled Sampler

- ✓ (b) Split Spoon Sampler
(d) Flexible Sampler

✓ (iii) If liquid limit for a soil is 30% the compression index will be

- (a) 0.018
(c) 0.18

- ✓ (b) 1.8
(d) 0.009

✓ (iv) Negative skin friction in piles

1. It is developed when the pile is driven through a recently deposited clay layer.
2. It is developed when the pile is driven through a layer of dense sand.
3. It is developed due to a sudden draw down of water table.

Which of these statements is/are correct?

- (a) 1
(c) 2 and 3

- (b) 2
(d) 1 and 3

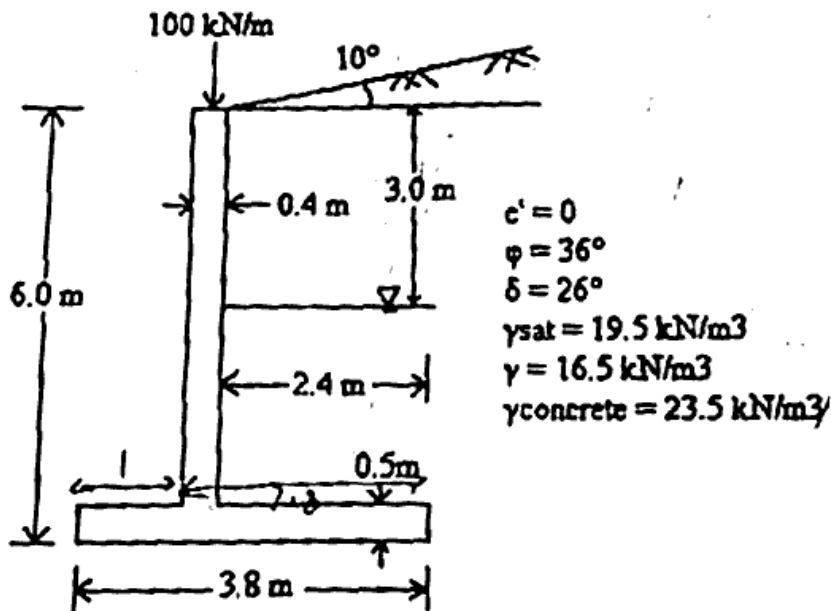
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CS/B.Tech/CCE/Odd/SEM-5/CE-501/2018-19

- Q. Calculate the net ultimate bearing capacity of a rectangular footing $1.8 \text{ m} \times 3.6 \text{ m}$ in plan founded at a depth of 1.6 m below the ground surface. The load on the footing acts at an angle of 16° to the vertical and is eccentric in the direction of width by 15 cm . The unit weight of the soil is 18 kN/m^3 . Natural water table is at a depth of 2 m below the ground surface. Given that, $c = 15 \text{ kN/m}^2$, $\phi = 30^\circ$, $N_c = 30.10$, $N_q = 18.38$ and $N_\gamma = 22.4$.
- Q. (a) Write a short note on negative skin friction. (b) A symmetrical 16 pile group in soft clay, with unconfined compressive strength of 40 kN/m^2 , is to be used as foundation for a column. The piles are 400 mm in diameter and 12 m long and spaced at 1 m centre to centre. Estimate the safe load capacity of the group with a factor of safety of 2.50 . The adhesion factor is 0.85 . $3 \times 12 = 36$
- Q. The section of a cantilever retaining wall along with other relevant details is shown in fig. below. Determine factor of safety against sliding, factor of safety against overturning, maximum and minimum base pressures of the wall.



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