Code No: 156BA **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February/March - 2022
FOUNDATION ENGINEERING
(Civil Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1. Explain in detail about preparation of soil investigation report. [15]

2. Explain any two boring methods with a neat sketch. [15]

3. Explain about Bishop's simplified method of slices with a neat sketch. [15]

4. An embankment has to be made of a soil with γ=18kN/m ^{3}, c_u =22kN/m^2, ϕ_u= 20^0. If factor of safety of 1.5 with respect to shear strength is required for the embankment slope, determine:
a) Limiting height of the slope if slope angle is 20^0 and
b) Seepage angle of the slope if embankment height is to be kept at 20m. [8+7]

5. Explain about Rankine's theory of active and passive earth pressures with a neat sketch. [15]

6. A retaining wall 6m high with a smooth vertical back retains a clay backfill with c′= 12kN/m^2, γ = 18kN/m ^{3} and φ'= 18 ^{0}. Calculate the total active thrust on the wall if tension cracks may develop to the full theoretical depth. [15]

7. A square footing 1.6m × 1.6m is placed over sand of density 17kN/m ^{3} and at a depth of 0.8m. The angle of shearing resistance is 20^0. The bearing capacity factors are Nc = 17.7, Nq = 7.4 and Nq = 5.0. Determine the total load that can be carried by the footing. [15]

8. A group of 16 piles of 45cm diameter is arranged with a centre to centre spacing of 1.0m. The piles are 12m long and are embedded in soft clay with cohesion 20 kN/m ^{2}. Bearing resistance may be neglected for the piles. Adhesion factor is 0.7. Estimate the ultimate load capacity of the pile group. [15]

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