Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech.**
PCI6I101

6th Semester Regular Examination 2017-18
FOUNDATION ENGINEERING
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 100
Q.CODE : C143

Answer Part - A which is compulsory and any four from Part - B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1. **Answer the following questions : *multiple type or dash fill up type :*** **(2 x 10)**

a) If the retaining wall moves away from the back fill it is known as _____ condition and if the wall move towards the back fill it known as _____ condition.

b) If the friction angle of backfill soil is 45°, the value of active earth pressure coefficient is _____and the value of passive earth pressure coefficient is _____

c) For a footing on purely cohesive soil the value of Terzaghi's bearing capacity factor N_c is _____and N_q is _____.

d) For a strip footing resting on sandy soil of Φ = 40° _____ shear failure will be observed and for Φ=24° _____shear failure will be observed.

e) In case of loose sand _____ type of pile is preferred and in case of stiff clay _____ type of pile is preferred.

f) For a square footing on sandy soil _____ type of settlement is observed and in case of soft clay _____ type of settlement is observed.

g) The lower wedge-shaped portion of the well steining is known as _____, it facilitate the process of _____

h) In case of multistoried building on soft soil _____ foundation is preferred and for bridge _____ foundation is preferred.

i) _____ type of soil sample is obtained using split spoon sampler and _____type of soil sample is obtained using shelby tubes.

j) For grain size distribution _____ type of soil sample is required and for consolidation test _____ type of soil sample is required.

Q2. **Answer the following questions : *Short answer type :*** **(2 x 10)**

a) Differentiate between friction pile and end bearing pile.

b) For clayey soil having q_u=100 kPa and Υ_{sat}=20 kN/m^3 what is the depth of tension crack?

c) The total active thrust on a vertical wall 3m high retaining a horizontal sand backfill (unit wt = 20kN/m^3,angle of shearing resistance =30^0)when the water table is at the bottom of the wall will be?

d) In case of driven pile if the in-situ friction angle of soil is 40°, what is the friction angle after pile driving?

e) Draw Mohr circle for active and passive earth pressure?

f) What is negative skin friction? Why negative skin friction is developed in the pile?

g) Draw the diagram of Double D-well and Dumbbell shape well.
h) Differentiate between primary and secondary consolidation.
i) What is RQD? What is recovery ratio?
j) Write the name of two field and two lab test to evaluate the modulus of elasticity of soil.

Part – B (Answer any four questions)

Q3. a) Retaining wall 6 m high has a smooth vertical back .The backfill has a horizontal surface in level with the top of the wall. There is uniformly distributed surcharge load 40 kN/m^2 intensity over the backfill. The unit weight of the backfill is 18kN/m^3. Angle of shearing resistance is 30^0 and c = 0. Determine magnitude and point of application of active pressure per meter length of the wall? **(10)**

b) How tensile cracks occur in soil? Describe the different situations? **(5)**

Q4. a) A strip footing 2 m wide carries a load intensity of 400kN/m^2 at a depth of 1.3 m in sand. The saturated unit wt of sand is 19.5 kN/m^3 and unit eight of sand is 19.5KN/m^3 and unit weight above water table is 16.8 kN/m^3.The shear strength parameters are c = 0 and $\Phi=35^0$. Determine the factor of safety with respect to shear failure for the following cases of location of water table. **(10)**
a) W.T is 4 m below G.L. (b) W.T is 1.3 m below ground level.
c) W.T is at G.L itself. (d) W.T is 2.6 m below G.L.
Use Terzhagi's equation. (Take N_q=41.4,N_y=42.4)

b) What are different methods to estimate bearing capacity of soil? Describe one field method? **(5)**

Q5. a) Differentiate between shallow foundation and deep foundation? Describe any two types of shallow foundations with net sketch? What is settlement of footing? **(10)**

b) A 500 mm wide, square in section concrete pile 15 m long driven in a deep deposit of uniform clay. Laboratory unconfined compression tests on undisturbed samples indicate an average q_u value of 75 kN/m^2. Calculate the ultimate load capacity of the pile.(Take N_C = 9, α = 0.8) **(5)**

Q6. a) What are the methods to determine the load carrying capacity of pile? Describe static formulae for granular soil and clayey soil? What is group action in piles? **(10)**

b) What is caisson? What are different component parts and forces acting on a well foundation? **(5)**

Q7. a) What is the objective of site exploration and its steps? Describe different methods of boring? **(10)**

b) Describe the procedure for sampling soil? **(5)**

Q8. a) Which tests are useful for general soil exploration? Describe Geophysical methods? **(10)**

b) Write notes on rock joints, faults and folds? **(5)**

Q9. a) **Write short notes on :** **(10)**
(a) Coulombs active wedge
(b) SPT test

b) **Write brief notes on :** **(5)**
(a) Safe bearing capacity
(b) Under reamed pile