Total No. of Questions : 6] **SEAT No. :**

P477

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TE/Insem/APR - 3
T.E. (Civil)
FOUNDATION ENGINEERING
(2012 Pattern)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4 and Q.5 or Q.6.***
2) ***Figures to the right side indicate full marks.***
3) ***Use of logarithmic tables, slide rule, Mollies charts, electronics pocket calculator and steam tables is allowed.***
4) ***Assume suitable data if necessary.***
5) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) Define **[5]**

i) Area ratio

ii) Inside clearance

iii) Outside clearance

iv) R.Q.D

v) Recovery ratio

b) The standard penetration test is conducted in fine saturated sand below ground water table. Find the corrected standard penetration number due to dilatancy, if recorded standard penetration number is 40. **[5]**

OR

Q2) a) Explain the purpose / necessity of subsoil exploration. **[5]**

b) State and explain the factors on which the extent and depth of exploration of soil depends. **[5]**

Q3) a) Explain with neat sketches modes of shear failure of soil. **[5]**

P.T.O.

b) The result of two plate load tests for a settlement of 25.4 mm are given **[5]**

Plate Diameter	Load
0.305	31 KN
0.610	65 KN

The square column footing is to be designed to carry a load of 800 KN with allowable settlement of 25.40 mm. Determine size of footing using Housel Shear Concept.

OR

Q4) a) Explain effect of ground water table on bearing capacity of soil. **[5]**

b) Compute the safe bearing capacity of a square footing 2 m × 2 m located at a depth of 1.2 m below the ground level in a sandy soil of average density of 18 KN/m^2, $\phi = 20°$, Nc = 17.7, Nq = 7.4, Nγ = 5. Assume factor of safety = 2.5 and water table very deep. Use Terzhaghi Equation. **[5]**

Q5) a) Define the following : **[6]**

i) Coefficient of compressibility

ii) Compression index

iii) Coefficient of volume compressibility.

b) The oedometer test gives time of 90% consolidation as 18 minutes on a 20 mm thick specimen (double drainage - floating ring). Determine the time required for 50% consolidation for a clay bed 3 m thick with single face drainage. **[4]**

OR

Q6) a) Explain the terms Normal consolidation. Over consolidation and Under consolidation. **[6]**

b) A layer of soft clay 5 m thick lies under a newly constructed building. The effective pressure due to overlying strata on the clay layer is 300 KN/m^2 and new construction increases the overburden by 120 KN/m^2. If the compression index of the clay is 0.45, compute the settlement, assuming the void ratio as 1.161. **[4]**

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