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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

TEST - 1

Even Semester: 2018-19

Course Code: CIV214

Course Name: Foundation Engineering

Programme & Sem: B.Tech (CSE) & VI Sem

Date: 05 March 2019

Time: 1 Hour

Max Marks: 40

Weightage: 20%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **three** marks.

(4Qx3M=12)

1. Explain with neat sketch of three types rotational slopes failure
2. Write assumption of Boussinesq's equation of stress in soil.
3. Define isobar? Explain with sketch.
4. A circular area on the surface of an elastic mass of great extent carries a uniformly distributed load of 120 kN/m^2 . The radius of the circle is 3 m. Compute the intensity of vertical pressure at a point 5 metres beneath the centre of the circle using Boussinesq's method.

Part B

Answer **both** the Questions. **Each** question carries **eight** marks.

(2Qx8M=16)

5. Explain with neat sketch Swedish slip circle method determining slope stability analysis of $c - \phi$ soils.
6. A 6m deep canal has side slope of 1:1. The properties of soil are $c = 20 \text{ kN/m}^2$, $\phi = 10^\circ$, $e = 0.8$, $G = 2.8$. If the Taylor's stability number is 0.108. determine the factor of safety with respect to cohesion, when canal runs full. Also find the same in case of sudden draw down. If the Taylor's stability number for these conditions is 0.137, 6m deep canal.

Part C

Answer the Question. Question carries **twelve** marks.

(1Qx12M=12)

7. A concentrated load of 40kN acts on the surface of a soil. determine the vertical stress increment at points directly below the load up to a depth of 10m and draw a plot of variation of stress



PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM FINAL EXAMINATION

Even Semester: 2018-19

Course Code: CIV 214

Course Name: Foundation Engineering

Program & Sem: B. Tech & VI Sem

Date: 22 May 2019

Time: 3 Hours

Max Marks: 80

Weightage: 40%

Instructions:

- (i) Read the question properly and answer accordingly.
- (ii) The question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted.
- (iv) Use of Graph sheet permitted.

Part A

Answer **All** the Questions.

(20 Marks)

1. The question consists of **five** multiple-choice questions. **Each** MCQ carries **one** mark.
Choose **only one** appropriate choice. (5Qx1M=5 Marks)

- (i) When face failure of slope occurs, the slip surface passes through
 - a. Toe
 - b. Base
 - c. slope
 - d. None of the above
- (ii) The vertical stress given by Newmark's influence chart is directly proportional to
 - a. Influence Value
 - b. Number of enclosed area units
 - c. Load intensity
 - d. All of the above
- (iii) Choose the Wrong statement, where K_p = Coefficient of passive earth pressure
 K_a = Coefficient of active earth pressure
 - a. K_p is less than K_a
 - b. K_p may be equal to K_a
 - c. K_p is greater than K_a
 - d. K_p and K_a are functions of soil frictional angle
- (iv) Clay soil is not a good backfill material for retaining walls; due to
 - a. Shrinkage
 - b. Swelling
 - c. Tensile cracks
 - d. All of the above
- (v) The relative density of soil for local shear failure
 - a. Greater than 35%
 - b. Varies between 35% and 70%
 - c. Greater than 50%
 - d. Less than 70%

2. The question consists of **five** multiple-choice questions. **Each** MCQ carries **two** marks. Choose **only one** appropriate choice. (5Qx2M=10 Marks)

- (i) Cohesion = 28 kN/m², Unit weight of soil = 18 kN/m³, Taylor stability number is 0.064, The critical height of slope is
 - a. 32.25 m
 - b. 24.32 m
 - c. 15.38 m
 - d. 16.46 m
- (ii) A point load of 200 kN act at foundation. If the Boussinesq's influence coefficient is 0.2733, the vertical stress along the axis of the load at a depth of 10m is
 - a. 0.55 kN/m²
 - b. 546 kN/m²
 - c. 5.46 kN/m²
 - d. 0.85 kN/m²
- (iii) The properties of the sand are void ratio = 0.5, specific gravity=2.7 and active earth pressure coefficient is (1/3). The active earth pressure at the base of the 7 meter height retaining wall is
 - a. 6.23 kN/m²
 - b. 3.11 kN/m²
 - c. 20.6 kN/m²
 - d. 41.2 kN/m²
- (iv) The soil has the following properties: cohesion = 26.7 kN/m², mobilized cohesion = 17.8 kN/m², angle of friction = 15°, mobilized angle of friction = 12°, the average inter granular pressure is 102.5 kN/m². Factor of safety with respect to strength is
 - a. 1.37
 - b. 1.5
 - c. 1.27
 - d. 1.7
- (v) Ultimate bearing capacity of soil is 1361.2 kN/m². Effective surcharge at base level of footing is 27 kN/m². The safe bearing capacity using factor of safety 3 is
 - a. 483.73 kN/m²
 - b. 462.73 kN/m²
 - c. 471.70 kN/m²
 - d. 444.73 kN/m²

3. Match the following- (5 Marks)

Group – I

- (i) Isobar
- (ii) Westergaard's method
- (iii) Swedish circle method
- (iv) Terzaghi's Method
- (v) Rankine's method

Group –II

- a. Bearing Capacity
- b. Lateral earth pressure
- c. Stability of Slopes
- d. Stress Contour
- e. Vertical Stress

Part B

Answer **all** the Questions. **Each** question carries **ten** marks. (4Qx10M=40M)

4. Explain standard penetration test with corrections to obtained readings.

5. Two plate load tests at a site gave the following results:

Size of plate	Load	Settlement
0.305 x 0.305 m	40 kN	25 mm
0.610 x 0.610 m	40 kN	15 mm

If there are two columns, one of the size 2.5 m x 2.5 m, carrying a load of 2700 kN, and the other of size 3m x 3m, carrying a load of 3900 kN, determine the differential settlement. The columns are 7 m apart.

6. Discuss the classification of piles based on material and load transfer methods.

7. Write a note on inside clearance, outside clearance, area ratio and recovery ratio.

Part C

Answer **both** the Question. **Each** question carries **ten** marks. (2Qx10M=20M)

8. Discuss the site investigation report.

9. A group of 9 piles arranged in square pattern was driven into soft clay extending to a large depth. The diameter and length of piles were 30cm and 9m, respectively. If the cohesion of clay is 4500 kg/m² and the pile spacing is 100 cm centre to centre, what is the safe load capacity of pile group? Assume factor of safety of 2.5 and adhesion factor 0.75.

Roll No.

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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

SUMMER TERM / MAKE UP END TERM EXAMINATION

Even Semester: 2018-19

Date: 24 July 2019

Course Code: CIV 214

Time: 3 Hour

Course Name: Foundation Engineering

Max Marks: 80

Program & Sem: B. Tech (Civil) & VI Sem (2015 Batch)

Weightage: 40%

Instructions:

- (i) **Answer all questions**
- (ii) **Question paper consists of 3 parts**
- (iii) **Use of scientific and non-programmable calculators are permitted**

Part A

Answer **all** Questions. **Each** question carries **five** marks. (4Qx5M=20)

1. Explain ENR formula for the determination of load carrying capacity of piles.
2. Name the five types of boring.
3. What is the difference between disturbed samples and undisturbed samples?
4. Explain soil exploration report.

Part B

Answer **all** Questions. **Each** question carries **eight** marks. (5Qx8M=40)

5. Explain negative skin friction. How can it be eliminated
6. Explain the classification of piles based on load transfer.
7. Explain the two corrections in standard penetration test.
8. Explain pile load test along with load settlement curve.

Part C

Answer **both** Questions. **Each** question carries **ten** marks. (2Qx10M=20M)

9. A precast concrete pile (35 cm X 35 cm) is driven by a single acting steam hammer. Estimate the allowable load using modified Hiley's formula (Factor of safety = 4). Use the following data

- Maximum rated energy = 3500 kN-cm
- Weight of hammer = 35 kN
- Efficiency of hammer = 0.8
- Coefficient of restitution = 0.5
- Weight of pile cap = 3 kN
- No of blows for last 25.4 mm = 3 kN
- C = 1.82

10. A group of 9 piles arranged in square pattern was driven into soft clay extending to a large depth. The diameter and length of piles were 0.03 m and 9m, respectively. If the cohesion of clay is 25 kN/m^2 and the pile spacing is 0.1 m centre to centre, what is the safe load capacity of pile group? Assume factor of safety of 2.5 and adhesion factor 0.75.