Hall Ticket No | | | | | | | | | | | Question Paper Code: ACE018

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER - II

B.Tech VI Semester End Examinations (Regular), May - 2020

Regulations: R16

FOUNDATION ENGINEERING

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from
each Unit All Questions Carry
Equal Marks
All parts of the question must be answered in one place only

UNIT– I

1.	a)	Discuss briefly about plate load test on soil?	**[7M]**
	b)	Write a detailed note on various types of boring techniques?	**[7M]**
2.	a)	A SPT was performed at a depth of 20m in a dense sand deposit with a unit Weight of 17.5kN/m2. If the observed N-value is 38, what is the N- value Corrected for overburden?	**[7M]**
	b)	Explain in detail Standard penetration test and corrections?	**[7M]**

UNIT – II

3.	a)	Discuss the stability analysis of infinite slopes in cohesion less soils for no Seepage condition.	**[7M]**
	b)	Find factor of safety of a 5m slope of infinite extent having a slope angle of 25°. The slope is made of cohesion less soil with φ = 30°, γ = 17kN/m3, γsat = 19kN/m3. Also analyze the slope if it is made of clay having c‘= 30kN/m2, φ‘= 20°, e = 0.65 And Gs= 2.7 and under the following conditions: i. when soil is dry ii. When the Slope is submerged	**[7M]**
4.	a)	Explain stability of earthen dam in full reservoir condition	**[7M]**
	b)	Explain the method of slices for estimation on factor of safety of finite slopes.	**[7M]**

UNIT – III

5.	a)	Describe briefly Rankine’s earth pressure theory.	**[7M]**
	b)	Explain the details of various types of retaining walls	**[7M]**
6.	a)	Explain with neat diagram retaining against sliding.	**[7M]**
	b)	Explain the culuman’s graphical methods.	**[7M]**

UNIT – IV

7.	a)	Explain the Static method for Estimating the load carrying capacity of a single pile driven in Cohesive soil.	**[7M]**
	b)	Explain in detail Meyerhof Bearing Capacity Theory	**[7M]**
8.	a)	What are the effects of Effects of pile driving?	**[7M]**

b) Determine the ultimate bearing capacity of a strip footing, 1.5 m wide, with its base at a depth of 1m, resting on a dry sand stratum take γd=17kN/m3, c'= 0 kPa and φ=38°. Use Terzaghi theory **[7M]**

UNIT – V

9. a) Discuss the different shapes of Cross-sections of wells used in practice, giving the merits and demerits of each. **[7M]**

b) What is the procedure for sinking of pneumatic caisson? **[7M]**

10. a) A square footing carries a load of 1000 kN. The depth of footing is 2 m. The properties of soil are C = 10 kPa and Φ= 480, γ = 19.5 kN/m3 Determine the size of footing for FOS = 3 against shear failure. What will be changes in size of footing? If WT rises to G.L. Give that Nc =42, Nq = 39 and Nγ = 45. **[7M]**

b) What are Tilts and Shifts? What are the remedial measures to control these? **[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

CO 1	Understand the need and various methods of soil exploration, planning and preparation of soil investigation report
CO 2	Analyze the stability of slopes by various methods
CO 3	Understand various earth pressure theories and stability of retaining walls at various conditions
CO 4	Understand shallow and deep foundations according to various bearing capacity theories and analyze Pile foundations in various different soils
CO 5	Understand various shapes and components of wells and analyze, design according to IRC guidelines

COURSE OUTCOMES:

CO 1	Understand the need and various methods of soil exploration, planning and preparation of soil investigation report
CO 2	Analyze the stability of slopes by various methods
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COURSE LEARNING OUTCOMES (CLOs):

ACE018.01	Understand the need and methods of soil exploration.
ACE018.02	Understand various methods of sampling and boring.
ACE018.03	Learn how to perform field tests such as SPT, DCPT, CPT.
ACE018.04	Learn how to perform Plate Load test for finding load bearing capacity, settlements of Soils.
ACE018.05	Learn how to perform in-situ test using pressure meter.
ACE018.06	Understand the importance of geophysical methods.
ACE018.07	Learn how to prepare Soil investigation report.
ACE018.08	Understand basic concepts of earth slopes.
ACE018.09	Analyze failure of infinite slopes.
ACE018.10	Analyze types of failures for finite slopes.
ACE018.11	Learn how to find Stability of slopes by Swedish arc method.
ACE018.12	Learn how to find Stability of slopes by method of slices for slopes.
ACE018.13	Find Stability of slopes by Taylor's stability number.
ACE018.14	Understand basic concepts of Stability of slopes of earth dam under different conditions.
ACE018.15	Understand concepts of earth pressure theories for stability of retaining walls.
ACE018.16	Calculate active and passive earth pressures from Rakine's earth pressure theories
ACE018.17	Calculate active and passive earth pressures from Coulomb's & Culmann's method.
ACE018.18	Asses the stability of retaining wall against overturning, sliding, bearing capacity.
ACE018.19	Understand the concepts of safe bearing capacity, ultimate bearing capacity etc.,

ACE018.20	Calculate the bearing capacity of shallow foundation using Terzaghi, Meyerhof, Skempton and IS methods.
ACE018.21	Calculate the load carrying capacity of pile using static, dynamic pile formula and pile Load test.
ACE018.22	Calculate load carrying capacity of pile group in sands and clay and settlement of pile Group.
ACE018.23	Learn different shapes of well & components of Well foundation.
ACE018.24	Understand the principle of analysis and design of wells, Seismic analysis and IRC Guidelines.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	ACE018.04	Learn how to perform Plate Load test for finding load bearing capacity, settlements of soils...	CO 1	Understand
	b	ACE018.01	Understand the need and methods of soil Exploration.	CO 1	Understand
2	a	ACE018.03	Learn how to perform field tests such as SPT, DCPT, CPT.	CO 1	Understand
	b	ACE018.03	Learn how to perform field tests such as SPT, DCPT, CPT.	CO 1	Remember
3	a	ACE018.08	Understand basic concepts of earth slopes.	CO 2	Understand
	b	ACE018.14	Understand basic concepts of Stability of slopes of earth dam under different conditions.	CO 2	Understand
4	a	ACE018.14	Understand basic concepts of Stability of slopes of earth dam under different conditions.	CO 2	Understand
	b	ACE018.12	Learn how to find Stability of slopes by method of slices for slopes.	CO 2	Remember
5	a	ACE018.16	Calculate active and passive earth pressures from Rankine's earth pressure theories	CO 3	Understand
	b	ACE018.15	Understand concepts of earth pressure theories for stability of retaining walls.	CO 3	Understand
6	a	ACE018.18	Asses the stability of retaining wall against overturning, sliding, bearing capacity.	CO 3	Understand
	b	ACE018.17	Calculate active and passive earth pressures from Coulomb's & Culuman's method.	CO 3	Remember
7	a	ACE018.19	Understand the concepts of safe bearing capacity, ultimate bearing capacity etc.,	CO 4	Understand
	b	ACE018.20	Calculate the bearing capacity of shallow foundation using Terzaghi, Meyerhof, Skempton and IS methods.	CO 4	Remember
8	a	ACE018.21	Calculate the load carrying capacity of pile using static, dynamic pile formula and pile load test.	CO 4	Understand
	b	ACE018.19	Understand the concepts of safe bearing capacity, ultimate bearing capacity etc.,	CO 4	Remember
9	a	ACE018.23	Learn different shapes of well & components of Well foundation.	CO 5	Understand
	b	ACE018.23	Learn different shapes of well & components of Well foundation.	CO 5	Remember
10	a	ACE018.19	Understand the concepts of safe bearing capacity, ultimate bearing capacity etc.,	CO 5	Understand
	b	ACE018.24	Understand the principle of analysis and design of wells, Seismic analysis and IRC Guidelines.	CO 5	Remember

Signature of Course Coordinator **HOD, CE**