Code No: R05410101 **R05** **Set No. 2**

IV B.Tech I Semester Examinations, November 2010
FOUNDATION ENGINEERING
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. A 600 mm diameter pile is to be installed at a site that is characterized by two sand layers. The top layer is 12 m thick, has a $\gamma = 20$ kN/m^3 and $\theta = 30^0$ the bottom layer is 20 m thick, has a $\gamma = 22$ KN/m^3 and $\theta = 35^0$. The ground water table is of the ground surface. Compute the unit end bearing and the unit skin friction at depths of 10, 15, 20 and 25m below the ground surface. Use $N_q = 20$ for $\phi = 30^0$ and $N_q = 50$ for $\phi = 35^0$. Take $\delta = \phi$ and K = 1.0. [16]

2. In a seismic refraction study of an area has given the following data.

i.	Distance from impact point to geophone in(M)	15	30	60	90	120
ii.	Time to receive waves(S)	0.025	0.05	0.10	0.11	0.12

   (a) Plot time- Travel graph, determine seismic velocity for the surface longer and underlying layer.

   (b) Determine the thickness of upper layer Give the probable earth material in the two layers. [16]

3. During a sub - surface exploration programme, two cohesive layers are encountered. One forms the top layer of finite thickness 3m, which is stiff clay and the bottom one is soft and showed undrained shear strength of 135 and 50 kN/m^2, and the respective unit weights are 17.2 and 16.7 kN/m^3. It is intended to design a foundation 1.5m from the ground surface. Compute the gross load for the foundation with a factor of safety 2.5. If the layered system is assumed as homogeneous and isotropic with average values of cohesion and unit weights of both the layers, what is the percentage error involved? [16]

4. What are the various types of retaining walls explain them in detail along with the sketches. [16]

5. (a) For a c-ϕ' soil, derive an equation for F.S. by Swedish method of slices, describing to obtain the locations of most critical slip circle.

   (b) An embankment 6m high has a slope of a 1V : 2H. The soil has ϕ=30^0. c = 5KPa and γ=19KN/m^3. A trial slip circle has a radius of 8.8m and its centre is at the same level as the top of the embankment the slip circle passes through the toe. Find the F.S. with respect to this slip circle by the method of slices. [8+8]

6. A Smooth Vertical wall 6 m high retains soil having c = 25 kPa; ϕ= 30^0, γ = 18 kN/m^3. Draw the Rankines pressure distribution diagram and also find the magnitude and point of application of passive earth pressure given H=6m [16]

7. What do you understand by the term 'efficiency of a pile group'? Derive the expression of spacing between friction piles for 100% efficiency of the pile group. [16]

8. Plate load test data are given below. Plot the load - settlement curve and find the ultimate bearing capacity.
Width of plate = 300 mm
Least count of dial gauge = 0.01 mm:

Load intensity (kN/m^2)	Dail gauge reading		
	A	B	C
0	0	0	0
55	186	192	192
110	362	365	353
165	766	758	756
220	1886	1889	1865
280	4810	4806	4784
355	14006	14010	13984

[16]

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Code No: R05410101 **R05** **Set No. 4**

IV B.Tech I Semester Examinations, November 2010

FOUNDATION ENGINEERING

Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions

All Questions carry equal marks

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2. A Smooth Vertical wall 6 m high retains soil having c = 25 kPa; $\phi = 30^0$, $\gamma = 18$ kN/m^3. Draw the Rankines pressure distribution diagram and also find the magnitude and point of application of passive earth pressure given H=6m [16]

3. What are the various types of retaining walls explain them in detail along with the sketches. [16]

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ii.	Time to receive waves(S)	0.025	0.05	0.10	0.11	0.12

   (a) Plot time- Travel graph, determine seismic velocity for the surface longer and underlying layer.

   (b) Determine the thickness of upper layer Give the probable earth material in the two layers. [16]

5. What do you understand by the term 'efficiency of a pile group'? Derive the expression of spacing between friction piles for 100% efficiency of the pile group. [16]

6. During a sub - surface exploration programme, two cohesive layers are encountered. One forms the top layer of finite thickness 3m, which is stiff clay and the bottom one is soft and showed undrained shear strength of 135 and 50 kN/m^2, and the respective unit weights are 17.2 and 16.7 kN/m^3. It is intended to design a foundation 1.5m from the ground surface. Compute the gross load for the foundation with a factor of safety 2.5. If the layered system is assumed as homogeneous and isotropic with average values of cohesion and unit weights of both the layers, what is the percentage error involved? [16]

7. (a) For a c-ϕ' soil, derive an equation for F.S. by Swedish method of slices, describing to obtain the locations of most critical slip circle.

(b) An embankment 6m high has a slope of a 1V : 2H. The soil has ϕ=30^0. c = 5KPa and γ=19KN/m^3. A trial slip circle has a radius of 8.8m and its centre is at the same level as the top of the embankment the slip circle passes through the toe. Find the F.S. with respect to this slip circle by the method of slices. [8+8]

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Least count of dial gauge = 0.01 mm:

Load intensity (kN/m^2)	Dail gauge reading		
	A	B	C
0	0	0	0
55	186	192	192
110	362	365	353
165	766	758	756
220	1886	1889	1865
280	4810	4806	4784
355	14006	14010	13984

[16]

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Code No: R05410101 **R05** **Set No. 1**

IV B.Tech I Semester Examinations, November 2010
FOUNDATION ENGINEERING
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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Load intensity (kN/m^2)	Dail gauge reading		
	A	B	C
0	0	0	0
55	186	192	192
110	362	365	353
165	766	758	756
220	1886	1889	1865
280	4810	4806	4784
355	14006	14010	13984

[16]

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Code No: R05410101 **R05** **Set No. 3**

IV B.Tech I Semester Examinations, November 2010

FOUNDATION ENGINEERING
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) For a c-ϕ' soil, derive an equation for F.S. by Swedish method of slices, describing to obtain the locations of most critical slip circle.
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   Width of plate = 300 mm
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Load intensity (kN/m^2)	Dail gauge reading		
	A	B	C
0	0	0	0
55	186	192	192
110	362	365	353
165	766	758	756
220	1886	1889	1865
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