



SE-6747

B. E. III (Sem. V) (Civil) Examination
April / May – 2011
Geotechnical Engineering-II

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशवेष निशान्तीवाणी विगतो उत्तरवही पर अवश्य लपखवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. 3 (Sem. 5) Civil"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="Geotechnical Engineering-II"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="7"/> <input type="text" value="4"/> <input type="text" value="7"/>	Section No. (1, 2,.....) : <input type="text" value="Nil"/>
Student's Signature	

- (2) Assume suitable data, if necessary.
(3) Figures to the right indicate full marks.
(4) Explain with neat sketches, if needed.

- 1 (a) All questions are compulsory. 10
- (1) Net pressure intensity is defined as gross pressure intensity minus _____.
 - (2) When water table is at foundation level the value of water table correction factor RW2 is _____.
 - (3) In combined footing to keep the pressure constant the C.G. of load and _____ should be coincided.
 - (4) In standard penetration test the inner diameter of sampler is _____ mm and outer diameter of sampler is _____ mm.
 - (5) In seismic refraction method the waves are peaked up by _____ (write name of instrument).
 - (6) Terzaghi's bearing capacity factor depend on _____
(a) θ (b) θ and depth of footing (c) depth of footing.
 - (7) The pile which transfers load at its bottom hard strata is known as _____ pile.
 - (8) The fender pile is used for _____.

(9) Skempton's bearing capacity equation is used for _____ soil.

(a) cohesive (b) non cohesive (c) cohesive and non cohesive

(10) Pile used to reduce seepage is known as _____ pile.

(b) Discuss various methods of boring for site exploration of soil. **6**

OR

(b) Describe standard penetration test with sketch, specifications the corrections to be applied and interpretations. **6**

(c) Give general features of soil sampler. Describe design criteria of efficient soil sampler as per Indian standard. **5**

2 (a) Describe proportioning of trapezoidal combined footing with neat sketches. **6**

OR

(a) Discuss various types of settlement of soil briefly. **6**

(b) Discuss the effect of water table on bearing capacity of soil. **5**

(c) A footing is to be constructed on clay having following properties : **6**

(i) U.C.S = 40 kN/m²

(ii) Ultimate bearing capacity of soil = 150 kN/m²

(iii) Unit weight of soil = 18 kN/m³

Find the depth at which footing is to be constructed.

3 (a) How the group capacity of pile is estimated in (a) sand and (b) clay ? Discuss briefly. **6**

(b) Describe pile load test with neat sketches. **6**

OR

(b) Discuss negative skin friction with neat sketches. **6**

- 4 (a) Answer the following. 10
- (1) If ϕ is the angle of internal friction of soil and i is inclined slope, then $i > \phi$ the slope is _____
(a) stable, (b) unstable.
 - (2) If the footing is _____, the disturbance of contact pressure is uniform irrespective type of the subgrade material.
(a) Fixed (b) Flexible
 - (3) If the soil mass is semi-infinite, it extends infinitely in all directions below a level surface.
 - (4) Define Isobar.
 - (5) For local shear failure the value of cohesion C is taken as _____ C of general shear failure.
 - (6) In the Column's wedge theory slip surface passes through the _____ of wall
(a) Heel, (b) toe, (c) none of above.
 - (7) Coefficient of passive earth pressure for soil having $\theta = 45^\circ$ is _____.
 - (8) What is active pressure ?
 - (9) What is passive pressure ?
 - (10) Give the Bossiness's polar radius stress equation.
- (b) Discuss stability of downstream slope during steady seepage in earthen dam. 6

OR

- (b) Explain friction circle method for the stability analysis. 6
- (c) An infinite slope is made of clay with following 6

properties : $\gamma_t = 18 \text{ kN/m}^3$: $\gamma' = 18 \text{ kN/m}^3$: $C' = 25 \text{ kN/m}^2$. $\theta = 28^\circ$.

If the slope has an inclination of 35° and height equal to 12 m, determine the slopes, when (a) the slope is surcharge (b) there is seepage parallel to the slope.

- 5 (a) Write a brief critical note on “Westerguard analysis.” 5

OR

- (a) Discuss vertical stress distribution on a horizontal plate at Z below ground surface due to concentrated load. 5
- (b) A rectangular areas 2×4 m carries a uniform load 80 kN/m^2 at the ground. Find the vertical pressure 5 m below the center and of the loaded area. 6
- 6 (a) Discuss lateral pressure distribution for fully submerged and partly submerged backfill and derive formula for lateral pressure distribution. 6

OR

- (a) What are the aspects required to satisfy the stability of retaining wall ? Derive expression for earth pressure of coheseless soil with no surcharge. 6
- (b) Compute the intensity of active and passive earth pressure at depth of 8 m in dry cohesionless sand with an angle of internal friction of 18° . What will be the intensity of active and passive earth pressure if the water level ? Take saturated unit weight of 22 kN/m^3 . 7
- (c) Write assumption made in Rankine’s theory of earth pressure. 4