University of Mumbai
Examination 2020

Program: BE Civil Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester VI

Course Code: CE-C601 and Course Name: Geotechnical Engineering-II

Time: 1 hour   Max. Marks: 50

==

Note to the students:- All Questions are compulsory and carry equal marks .

Q1.	When degree of consolidation is 50%, then time factor is about
Option A:	0.196
Option B:	0.848
Option C:	0.500
Option D:	0.230
Q2.	The average effective overburden pressure of 10 m thick homogeneous saturated clay is 150 kPa. The consolidation test shows that void ratio decrease From 0.6 to 0.5 by increasing stress intensity from 100 kPa to 300 kPa. (G= 2.65) The initial void ratio of clay layer is
Option A:	0.209
Option B:	0.563
Option C:	0.746
Option D:	1
Q3.	Consolidation in soils
Option A:	Does not depend on present stress
Option B:	Is a fuction of pore water pressure
Option C:	Is a fuction of total stress
Option D:	Is a fuction of effective stress
Q4.	A soil sample is subjected to a hydrostatic pressure σ . The Mohr circle for any point in the soil sample would be
Option A:	a circle of radius σ and center at the origin
Option B:	a circle of radius σ and center at a distance σ from the origin
Option C:	a point at a distance σ from the origin
Option D:	a circle of diameter σ and center at the origin
Q5.	In a triaxial test carried out on a cohesionless soil sample with a cell pressure of 20 kPa. The observed value of applied stress at the point of failure was 40 kPa. The angle of internal friction (degree) of the soil is
Option A:	15
Option B:	10
Option C:	30

Option D:	25
Q6.	For a sample of dry, cohesionless soil with friction angle, Φ, the failure plane will be inclined to the major principal plane by an angle equal to
Option A:	45 + Φ/2
Option B:	Φ
Option C:	45
Option D:	45 - Φ/2
Q7.	In friction circle method of slope stability analysis, if r defines the radius of the slip circle, the radius of friction circle is
Option A:	r sinΦ
Option B:	r tanΦ
Option C:	r cosΦ
Option D:	r
Q8.	An infinite soil slope with an inclination of 35 degree is subjected to seepage parallel to its surface. The soil has c¢ = 100 kN/m2 = f¢=30 degree. Using the concept of mobilized cohesion and friction, at a factor of safety of 1.5 with respect to shear strength, the mobilized friction angle is (in degree)
Option A:	21.02
Option B:	20.02
Option C:	22.02
Option D:	23.02
Q9.	A deep cut of 7m has to be made in a clay with unit weight 16 kN/m3 and a cohesion of 25 kN/m2. What will be the factor of safety if one has to have a slope angle of 30 degree? Stability number is given to be 0.178 (from Taylors chart) for a depth factor of 3
Option A:	0.8
Option B:	1
Option C:	1.25
Option D:	1.1
Q10.	When a retaining wall moves away from the back-fill, the pressure exerted on the wall is termed as
Option A:	Active earth Pressure
Option B:	Passive earth Pressure
Option C:	Swelling pressure
Option D:	Pore pressure
Q11.	To have zero active pressure intensity at the tip of a wall in cohesive soil, one should apply a uniform surcharge intensity of
Option A:	- 2 c tan α
Option B:	2 c tan α

Option C:	2 c cot α
Option D:	-2 c cot α
Q12.	If σh', σv' ,σh', and σv represent the total horizontal stress, total vertical stress, effective horizontal stress and effective vertical stress on a soil element, respectively, the coefficient of earth pressure at rest is given by
Option A:	σh/σv
Option B:	σh/σv'
Option C:	σv/σh
Option D:	σv/σh'
Q13.	Which type of retaining wall is more suitable for greater heights?
Option A:	Cantilever Retaining Wall
Option B:	Counterfort retaining wall
Option C:	Gravity Retaining Wall
Option D:	Semi- Gravity Retaining Wall
Q14.	The minimum allowable factor of safety against sliding in the case of a Cantilever retaining wall is
Option A:	2
Option B:	3
Option C:	2.5
Option D:	1.5
Q15.	A 3 m high retaining wall is supporting a saturated sand (saturated due to capillary action) of bulk density 20 kN/m3 and angle of shearing resistance 30 degree . The change in magnitude of active earth pressure at the base due to rise in ground water table from the base of the footing to the ground surface shall (unit weight of water= 10 kN/m3)
Option A:	increase by 20 kN/m2
Option B:	increase by 20.1 kN/m2
Option C:	Decrease by 20 kN/m2
Option D:	Decrease by 20.1 kN/m2
Q16.	A footing is resting on the ground and having bearing capacity of 'X' unit when water table is at greater depth. During rainy season footing site gets flooded, what will be the it's bearing capacity?
Option A:	X/2
Option B:	2X
Option C:	X/4
Option D:	4X
Q17.	Two footings, one circular and the other square, and founded on the surface of a purely cohesionless soil. The diameter of the circular footing is same as that of

	the side of the square footing. The ratio of their ultimate bearing capacities is
Option A:	1/2
Option B:	4/3
Option C:	3/4
Option D:	1.3
Q18.	The width and depth of a footing are 3 and 2.5 m respectively. The water table at the site is at a depth of 4 m below the ground level. The water table correction factor for the calculation of the bearing capacity of soil is
Option A:	0.875
Option B:	1
Option C:	0.916
Option D:	1.1
Q19.	A plate load test was conducted in sand on 300 mm diameter plate. If the plate settlement was 5 mm at a pressure of 150 kPa, the settlement (in mm) of a 5m x 8m rectangular footing at the same pressure will be
Option A:	9.4
Option B:	17.8
Option C:	18.6
Option D:	12.7
Q20.	Two circular footings of diameters D1 and D2are resting on the surface of the same purely cohesive soil. The ratio of their gross ultimate bearing capacities is
Option A:	D1/D2
Option B:	1
Option C:	D2/D1
Option D:	0.5
Q21.	Which of the following is a characteristic of general shear failure?
Option A:	Failure is accompanied by compressibility of soil
Option B:	Failure is sudden
Option C:	Bulging of shearing mass of soil
Option D:	No shear failure
Q22.	Negative skin friction in a soil is considered when the pile is constructed through a
Option A:	Fill materials
Option B:	dense coarse sand
Option C:	over consolidated stiff clay
Option D:	Dense fine sand
Q23.	A pile of 0.50m diameter and length 10m is embedded in a deposit of clay. The 2 undrained strength parameters of the clay are cohesion = 60kN/m2 and the

	angle in internal friction = 0. The skin friction capacity (kN) of the pile for an adhesion factor of 0.6, is
Option A:	67
Option B:	565
Option C:	281
Option D:	134
Q24.	A precast concrete pile is driven with a 50kN hammer falling through a height of 1.0m with an efficiency of 0.6. The set value observed is 4mm per blow and the combined temporary compression of the pile, cushion and the ground is 6mm. As per Modified Hiley Formula, the ultimate resistance of the pile is
Option A:	3000 kN
Option B:	4285.7 kN
Option C:	8333 kN
Option D:	11905 kN
Q25.	The group efficiency of pile group
Option A:	will be always less than 100%
Option B:	will be always greater than 100%
Option C:	may be less than 100% or more than 100%
Option D:	will be more than 100% for pile groups in cohesion less soils and less than 100% for those in cohesive soils.