


Name: Enrolment No:	
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES END Semester Examination, July 2020	
Program: B-Tech GSE	Semester: VI
Course: Soil Mechanics and Foundation Engineering	
Course Code: PEGS-3007	Max. Marks: 100
Pages:4	
Note: BB (online submission) Time: Part-I 2 Hour and Part –II 24 hours	

Instruction to Students

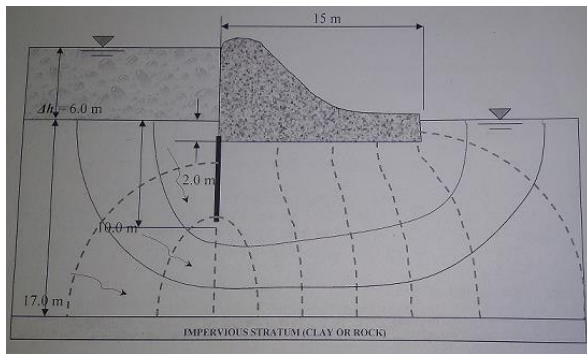
- Read the instruction carefully before attempting.
- The Part-I consist of 5 questions (each questions sub divided into 10), Total marks 75. Time is 2 hors
- The Part-2 consist of 2 questions (Assignment) Q. 1a & Q 1b = 15 Marks and Q.2 10 Marks
- All the qestions submitted within 24 hrs from the scheduled time (exceptional provision due extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas).
- No submission of Section B shall be entertained after 24 Hrs. The section B should be attempted in blank white sheets (hand written & neat sketch) with all the details like programme, semester, course name, course code, name of the student, Sapid at the top (as in the format) and signature at the bottom (right hand side bottom corner)
- The question number 1 to 6 (CO1- CO6).

PART -1

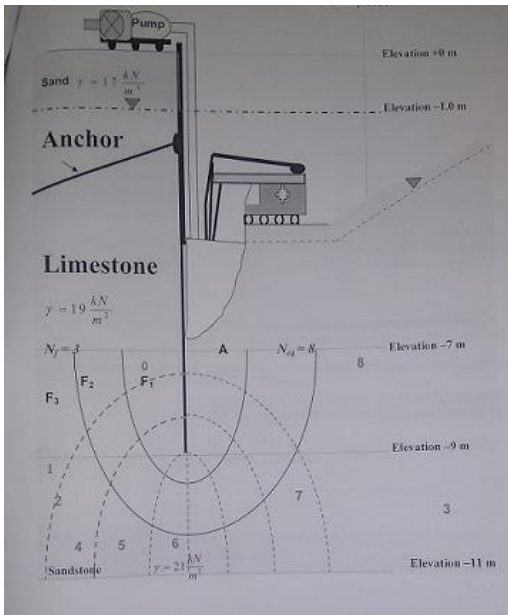
Question paper and Model answer End semester examination JULY 2020 PEGS-3007 Soil Mechanics and Foundation Engineering.									
Note: 5 question each question divided 10 question carry 1.5 Marks each.									
Total Marks : 75									
MCQ	15 Marks								Remarks
The soil dilatancy a phenomenon is discovered by	GoodMan	Incorrect	Reynolds	Correct	Terzaghi	Incorrect	Stockes	Incorrect	C01
A foundation is a collection of large diameter cylindrical columns is called	Grillae	Incorrect	Strap	Incorrect	Piers	Correct	Pad	Incorrect	C01
The vertical normal stress is largest compared to unknown load in ... foundation	Pile	Incorrect	sheet	Incorrect	Strip	Correct	Mat	Incorrect	C01
The gas and fluids they have shear modulus (shear force) is	Zero	Correct	one	Incorrect	two	Incorrect	None of the	Incorrect	C01
The underdrained shear strength of soil is characterised by only	Friction	Incorrect	Cohesion	Correct	Adhesion	Incorrect	None of the	Incorrect	C01
The method of analysis to determine the bending of retaining wall is called	CPT	Incorrect	BLUM	Correct	SPT	Incorrect	All of the	Incorrect	C01
The relative density is also called as	Density index	Correct	Compactio	Incorrect	None	Incorrect	Specific gr	Incorrect	C01
In uniaxial stress how many non-zero principle stress axis exist	Three	Incorrect	Four	Incorrect	one	Correct	Two	Incorrect	C01
In sheet pile the active stress coefficient is denote the value ofstress	Radial	Incorrect	Horizontal	Correct	Vertical	Incorrect	Axial	Incorrect	C01
The primary and secondary strain effect in clayey soil is due to	load	Incorrect	Secular	Correct	seconday	Incorrect	All of the	Incorrect	C01
MCQ 15 Marks									
The magnitude of the stress is equal in all direction in	Effective stress	Incorrect	Uniaxial s	Incorrect	Biaxial str	Incorrect	Hydrostat	Correct	CO2
The S1 is compensated by S3 so that no change in S2 strain is in	Uniaxial strain	Incorrect	Plain strai	Correct	Coaxial st	Incorrect	Volumetri	Incorrect	CO2
The removal of air filled porosity is called	Evaporation	Incorrect	Compactio	Correct	Consolida	Incorrect	Lithificatio	Incorrect	CO2
The bird eye porosity in carbonate rock is also called as	Vugy	Incorrect	Fracture	Incorrect	Moldic	Incorrect	Fenestral	Correct	CO2
The soil fed from water by capillary movement by frost action leads to develop....	Ice Lens	Correct	Cracks	Incorrect	Foliation	Incorrect	Fraccture	Incorrect	CO2
All impervious boundary lines are	Contour line	Incorrect	Flow line	Correct	Drainge li	Incorrect	Isogone li	Incorrect	CO2
The Rankine's theory of earth pressures well suitable for ... type retaining wall	RCC	Incorrect	Cantileve	Incorrect	All of the	Correct	Counterfo	Incorrect	CO2
Coulomb's earth pressure theory gives the same value as Rankine's theory when the wall is	Horizontal	Incorrect	vertical	Incorrect	smooth	Incorrect	vertical ar	Correct	CO2
The porosity is due to diagenetic process	Intercrytalline	Incorrect	Microporc	Incorrect	Primary	Incorrect	Secondary	Correct	CO2
The weight of back fill above the elevation of top of the wall and any other load is called	Back fill	Incorrect	overburde	Incorrect	None	Incorrect	Surcharge	Correct	CO2
MCQ 15 Marks									
The poisson's ratio in clay is ranging from	0.2	Incorrect	0.4	Correct	0.3	Incorrect	0.5	Incorrect	CO3
In Triaxial compressive stress = 3FL/2bD2 what is D indicate that	Thickness	Correct	Volume	Incorrect	Breadth	Incorrect	Width	Incorrect	CO3
The material movement of rupter with get high stress experienced in.....strength	Imapct	Incorrect	Compress	Incorrect	Fatigue	Incorrect	Flexural	Correct	CO3
Box shear test (direct shear stress) is suitable for soil samples	Loam	Incorrect	Clayey	Correct	Sandy	Incorrect	Granular	Incorrect	CO3
The measure of strength of materials under a cyclic loading is.....strength	Uniaxial	Incorrect	Compress	Incorrect	Flexrual	Incorrect	Fatigue	Correct	CO3
The forces which applied on collinear with longitudinal member is..... load	Axial	Correct	Shear	Incorrect	Compress	Incorrect	Transvers	Incorrect	CO3
The Terzaghi modified Coulomb's equation on the basis ofstress	Shear	Incorrect	Effective	Correct	Insitu	Incorrect	vertical	Incorrect	CO3
The head lost between two equipotential lines is known as	Potential drop	Correct	Flow drop	Incorrect	Diensity d	Incorrect	None of th	Incorrect	CO3
The imbalance between shear stress and shear strength in rock mass is measured by	RQD	Incorrect	RMR	Incorrect	RSR	Incorrect	SMR	Correct	CO3
When the shear strength completely reduces and its particles have tendency to move up in t	Buoancy	Incorrect	Quiksand	Correct	submerge	Incorrect	Upwordfo	Incorrect	CO3
MCQ 15 Marks									
The Entisol is a type of soil develop recently in A & O zone of soil horizon	TRUE	FALSE							CO4
The Uplift pressure on hydraulic structures exerted by percolating water	TRUE	FALSE							CO4
The QS of soil is measured to determine with shear failure	FALSE	TRUE							CO4
The melting point of rock reduces due to presence of air molecules	FALSE	TRUE							CO4
In Hydrometers analysis, Hydrometers are normally calibrated at 37°C	FALSE	TRUE							CO4
The sieve side walls of the container also affect the fall of particle	TRUE	FALSE							CO4
The Size D10 in grainsize is known as unconfined diameter	FALSE	TRUE							CO4
The flagstone are thick bedded isotropic rocks	FALSE	TRUE							CO4
The Engineering bricks are not susceptible to frost and freeze	TRUE	FALSE							CO4
The Embankment dams are not huge and made by earth or rock work	FALSE	TRUE							CO4
The series of cantilevers are used in ARC Dam construction	TRUE	FALSE							CO4
MCQ 15 Marks									
The huge amount of earth work is done in pile foundation	FALSE	TRUE							CO5
The properties of cohesive soil not depend upon the grain size distribution to some extent	FALSE	TRUE							CO5
The Coarser fraction comprising angular grains have higher bearing capacity	TRUE	FALSE							CO5
Kaoline is pure form of grey clay with iron rich	FALSE	TRUE							CO5
The soil is rich in iron and aluminium content is called lateritic soil	TRUE	FALSE							CO5
The moorum is a powdered rock which includes all kinds of disintegrated rock	TRUE	FALSE							CO5
The soil transported by gravity is called regolith	FALSE	TRUE							CO5
The misfire in a blasting cannot be caused by failure of detonation systems	FALSE	TRUE							CO5
The Fly rock can causes serious damage when the outside the blast zone	TRUE	FALSE							CO5
Note: Number of Main question are 5 and subdivided into 10 sub questions.									
Total Marks is 75 (each sub questions carries 1.5 Marks= 50X1.5=75)									

PAR- 2

Q. 6a The completed flow net for the dam shown below includes a steel pipe cutoff wall located at the head –waterside of the dam in order to reduce the seepage loss. The dam is half a kilometer in width (shore-shore) and the permeability of the silty sand stratum is 2.5×10^{-4} cm/s. Find the total seepage loss under the dam in liters per year and the would be dam be more stable if the cutoff wall was placed under the its tail –water side? ($N_f=3$, $N_{eq}=10$). **7.5 Marks**



Q) 6b A new office building will require a two-level underground parking garage. The size of the foundation site is 100X100 meters. Some the soil properties are shown in the figure. Estimate at what depth of the punching shear failure will be in limestone (if shear strength is 0.2 MN/m^2 and using a $1 \text{ m} \times 1 \text{ m}$ plug as a model and what size pump do you need ($\text{M}^3/\text{minutes}$) with a factor of safety of 3. **7.5 Marks**



Q.6c2 Discuss in brief Net bearing, allowable bearing and ultimate bearing capacity of soils to design Shallow foundation with suitable examples. **10 Marks**