

Name:
Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
END Semester Examination December 2020**

Program: B-Tech GSE
Course: Engineering Geology
Course Code: PEGS-3020
Number of pages: 03
Note: online submission

Semester: V
Time: 180 minute (3 hour)
Max. Marks: 100

SECTION A

- 1. Each questions carry 5 Marks 6 X 5 = 30 M**
2. Type answer for all the questions in the answer sheet using given space.
3. The maximum word limit is 30 or 3 lines (only question number 1, 2 & 3) and type single word answer for question number 4, 5 and 6).

Q.No	Question				COs
1	Define the following terms; a) Submerged Density and b) Permeability				CO1
2.	Distinguish between the following terms: i) Alfisol and Mullisol and ii) Tenacity and Fracture				CO2
3	Write a brief note on following terms in context with engineering geology; a) Attenberg limit and b) grain size analysis				CO3
4	Fill in the blanks with suitable answer: i. A state of 'soil liquefaction' occurs when theof soil is reduced to essentially zero. ii. forms when water saturates an area of loose sand and the ordinary sand is agitated. iii. A..... dam is constructed in a low spot or "saddle" through which the reservoir to permit higher water elevation. iv. Dams were timber crib dams used to help float logs downstream in the late 19th and early 20th centuries. v. When such an emergency bank is added on top of an existing levee it is known as a				CO4
5	MCQ (Choose correct answer and type the answer)	A) answer	B) answer	C) answer	CO5
	a)The styllitic structure is due to.....	Melting	Diffusion	Erosion	
	b) The soil dilatancy a phenomenon is discovered by....	Goodman	Stocks	Reynold	
	c) The soil fed from water by capillary movement by frost action leads to develop.....	Ice lens	Cracks	Rill	
	d) The removal of air filled porosity is called as.....	Lithification	Evaporation	Compaction	

	e) layer is the semi rigid part of the middle mantle that flows like hot asphalt	Hydrosphere	Lithosphere	Asthenosphere	
6	TRUE/False (Choose correct answer and type the answer)	A) True	B) False		CO6
	i) The Himalayan mountains good examples for constructive building mountains	A) True	B) False		
	ii) The elastic and brittle deformation in structure is not due to seismic activity.	A) True	B) False		
	iii) The Aa blocky rough lava with low viscosity	A) True	B) False		
	iv) The Scrap faces retreat laterally in up-dip direction	A) True	B) False		
	v) Strain is proportional to stress in elastic deformation	A) True	B) False		

SECTION B

1. Each questions carry 10 Marks
2. Scan and upload your answer
3. The maximum word limit is 500 or one page

5 X 10 = 50 M

Q.No	Question	COs
7	Define Liquefaction and discus in brief merits and demerits of liquefaction in geotechnical engineering	CO1
8.	Describe in brief the role and significance of following terms in geotechnical engineering a) Strength b) Stress-strain d) porosity e) permeability	CO3
9	Write a short note on role and significance of following terms in Rock mass rating. i) RMR ii) RQD iii) Q system iv) Terzaghi's rock classification	CO4
10	Define blasting and discus in brief classification and controls of blasting. OR Define Bearing capacity and discus in brief the classification and significance of bearing capacity in geotechnical engineering.	CO5
11	Discuss in brief the classification of dams and their engineering properties	CO2

SECTION B

1. Answer either question i), ii) (5+15) OR a), b) (5+15)
 2. Scan and upload your answer

1 X 20 = 20 M

Q.No	Question	COs
12	<p>i) Strike and true dip of the outcrop is N 65° E, 35°SE. Determine the apparent dip in Vertical section trending S 50° E by both numerical and Graphical method.</p> <p>ii) A soil sample was collected from the foundation site and it was subjected to various test, the tested properties of soil is as follows; weight of soil is 35.25 lb, volume of 0.386 ft³ and moisture content of 12.35%, specific gravity is 2.65. Draw a phase diagram and compute the unit weight, dry unit weight, degree of saturation, void ratio and porosity of soils. $\gamma_w = 62.4 \text{ lb/ft}^3$.</p> <p align="center">OR</p> <p>a) The soil samples were collected from the foundation site the values are as follows; soil layer length =8 ft and width 8 ft, Initial void ratio $e_0=0.9$, compressive index (CC/CI)=0.38, Effective pressure $\sigma' = 2100 \text{ lb/ft}^2$, $\Delta\sigma' = 900 \text{ lb/ft}^2$, secondary compressive index ($S\alpha$)=0.03 and assume primary consolidation is 1.5 years. Calculate the Total consolidation of settlement of soil layer assuming after 5 years</p> <p>b) A undistributed soil samples were obtained from a Boring in a proposed cut area. The average dry unit weight (γ_d) 102 lb/ft³, the average moisture content (w) 9.52 %. In the laboratory test was conduct for representative bulk samples, the result as follows; dry unit weight maximum ($\gamma_{d_{max}}$) 118 lb/ft³ and optimum moisture content (w) 11.25 %. A Proposed grading plan calls for cut (PPC) 11500 yd³ and Proposed plan for fill (PPF) 12000 yd³ and the specification for relative compaction of at least 90%. . $\gamma_w = 8.34 \text{ lb/gal}$ Compute the shrinkage factor b) Estimate the required quantity of import or export of soils based on unit weight in tons. c) Calculate import or export in tons using the moisture content. d) Determine the required quantity of water in gallons to bring the fill soils to the optimum moisture content using relative compaction of 92%</p>	CO6