Name:

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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
END Semester Examination June 2021

Program: M.Sc., Petroleum Geosciences **Semester: II**
Course: Engineering Geology **Time: 180 minute (3 hour)**
Course Code: PEGS-7014 **Max. Marks: 100**
Number of pages: 03
Note: online submission

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 in context with Engineering Geology; a) Submerged density & b) Intact rock	CO1
2.	Distinguish between the following terms: i) Cohesive soil and Non-Cohesive soil and ii) Tenacity and Fracture	CO2
3	Write a brief note on following terms in context with engineering geology; a) Thermal conductivity and b) Grain analysis	CO3
4	Fill in the blanks with suitable answer: i. A state of 'soil liquefaction' occurs when the …….of soil is reduced to essentially zero. ii. …….. is deform plastically when shear strength approaches constant shear stress over time. iii. The effective inter granular normal pressure is……to the shear plane pressure. iv. The…….. condition involving the spontaneous and violent detachment of rocks after blasting. v. The …… Rocks below the water table exhibits the properties of water bearing sand.	CO4
5	MCQ (Choose correct answer and type the answer) / A) answer / B) answer / C) answer a) The soil toughness is high the …….. content of soil is high. / Sand / Silt / Clay 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	CO5

	e) The ,,,,,,,,,,,, values are empirical constant representing joint and rock using in Hoek brown reactions for stress calculation	S	M	Both a and b	
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 frost heave of water within the soil causes vertical expansion of soil		A) True	B) False	
	iv) The hydrostatic stress is always equal distribution in all directions.		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** **5 X 10 = 50 M**
2. **Scan and upload your answer**
3. **The maximum word limit is 500 or one page**

Q.No	Question	COs
7	Write a short note on role and significance of following term in Engineering geology. a) Stress-strain b) Soil erosion c) consolidation or settlement d) Porosity and permeability	CO1
8.	Define excavation and Discuss in brief specific requirements and prevention measure should assure during excavation.	CO2
9	Write a short note on significance aspect of the following term analysis in Rock mass rating. i) RMR ii) RQD iii) Q system iv) RSR	CO3
10	Define blasting and discus in brief classification and controls of blasting. **OR** 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 ft^3** and moisture content of **12.35%,** specific gravity is **2.65**. Draw a phase diagram and compute the	CO4

	unit weight, dry unit weight, degree of saturation, void ratio and porosity of soils. **$\gamma w = 62.4$ lb/ft^3**.	
11	Describe in brief classification of bearing capacity in context with geotechnical engineering.	CO5

SECTION B

1. **Answer either question i), ii) iii) (5+8+7) OR iv) (20)** **1 X 20 = 20 M**
2. **Scan and upload your answer**

Q.No	Question		COs
12	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.	CO6
	ii)	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**, Primary compressive index (CC/CI)=**0.38**, Stress or Effective pressure σ'=**2100** lb/ft^2, Change in pressure $\Delta\sigma$'=**900** lb/ft^2, secondary compressive index (Cα)=**0.03** and assume primary consolidation is **1.5** years. Calculate the Total consolidation of settlement of soil layer assuming after **5** years..	
	iii)	The soil sample was collected from construction sites. The data as follows: Moisture content of soil (w) = 15 %, Moist unit weight (MUW) is 110 pcf, Specific gravity (SG)= 2.75. The minimum dry unit weight is (DUW) 105 pcf /per 20% moisture content. Determine How many cubic yard of excavated soil are need to produce 10000 yd3 of compacted fill and how many truck loads are need to be transport of soil, if each truck load carry 20 tons.	
		OR	
	iv)	Describe in brief the classification and significance of the following terms in context with engineering geology; i) Strength ii) Good man and Terzhaghi's rock classification.	