

Assessment Tool

School/ Department Name	School of Engineering/ Petroleum Engineering
Program Code and Title:	BEPP15 - Degree of Petroleum Engineering
Course Code and Title:	151PTE 321 – Engineering Geology
Assessment Number and Title:	Assessment 2 – Assignment # 2
Assessment Type:	Written Assignment
Assessment Location:	ACK – Online Submission
Assessment Date:	Friday 29 th January, 2021
Assessment Time/Duration:	Due: Sunday 31 st January, 2021 at 11:55 PM
Student Name:	
Student ID:	
Section (s):	G2P1, G2P2
Assessment General Instructions:	- This is a calculation based project and you may use the class material such as your lecture notes, online resource, and software such as excel (if needed). - You may not discuss or share this project or questions related to the project with your fellow classmates or other individuals. - Show your work, you may scan your hand work or insert calculation steps in this document. - Please type your answers using Microsoft Words and ensure to type your equations correctly. - If you require any assistance during the assessment period, please communicate through e-mail or MS Teams.

DO NOT WRITE IN THE AREA BELOW

Task Number	Maximum Marks	Student Marks
1	2.5	
2	2.5	
3	2	
4	5	
5	3	

Total Mark	15	
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Assessor Feedback:			
Assessor Name:	Dr. Seyed Mehdi Seyed Alizadeh	Date:	
Assessor Signature:			
Student Name:		Date:	
Student Signature:			

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Task 1:

(2.5 Marks)

What does Hjulström diagram represent?

(a) Describe this diagram in detail with its interpretation.

(1.5 Marks)

(b) Write down the empirical equations that can approximate the curves represented in the Hjulström diagram.

(1 Mark)

(Note: You need to write down all your references for the answers)

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Task 2:

(2.5 Marks)

A soil particle size distribution curve is available as shown in figure 2.

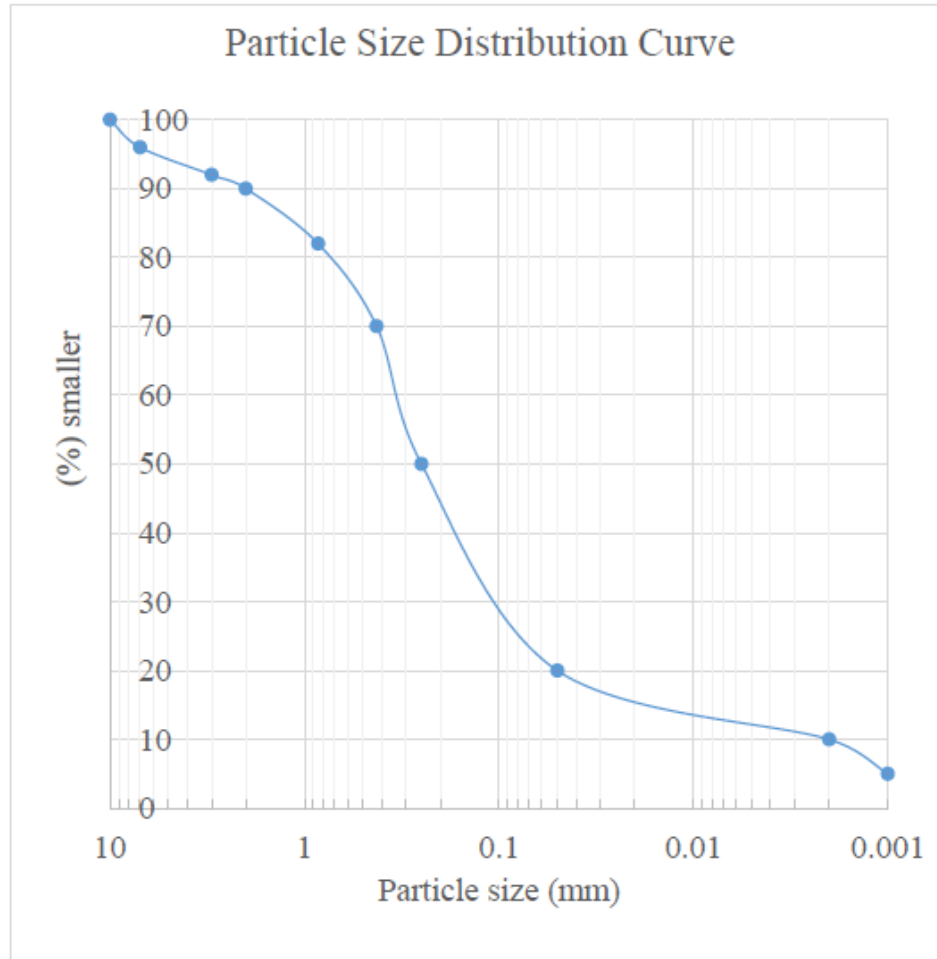


Figure 2: Particle size distribution

(a) Determine the gravel, sand, silt and clay size particles by percentage of each.

Note: Use the US department of agriculture (USDA) classification system.

(1.75 Marks)

(b) Calculate uniformity coefficient, coefficient of gradation and sorting coefficient for this sample.

(0.75 Marks)

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Task 3:

(2 Marks)

Total Alkalies Silica tests have been performed on a number of extrusive igneous rocks in the lab. The results of the tests are summarized in the table below:

Sample	Sodium Oxide (wt. %)	Potassium Oxide (wt. %)	Silica (wt. %)
Rock A	1	3	67
Rock B	8	6	55
Rock C	1	2	48

a) Determine the rock types that samples “A”, “B” and “C” belong to.

(0.75 Mark)

b) What is the equivalent plutonic igneous rock groups to each of samples A to C according to the chemical composition of constituting minerals?

(0.75 Mark)

c) Which of the tested samples belong to acidic and mafic igneous rock groups?

(0.5 Mark)

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Task 4:

(5 Marks)

Table 1 shows percentage of different components in sandstones from a geological location as obtained from lab analysis.

Table 1: Composition of sandstone samples

Sample No.	Quartz (%)	Lithics (%)	Feldspar (%)	Rock Type
A1	97	1	2	
A2	80	3	17	
A3	55	32	13	
A4	40	53	7	
A5	35	3	62	
A6	10	5	85	
A7	15	20	65	
A8	20	55	25	
A9	55	30	15	
A10	60	12	28	

a) Plot the points that correspond to each of the samples on the diagram presented in figure 3.

(2.5 Marks)

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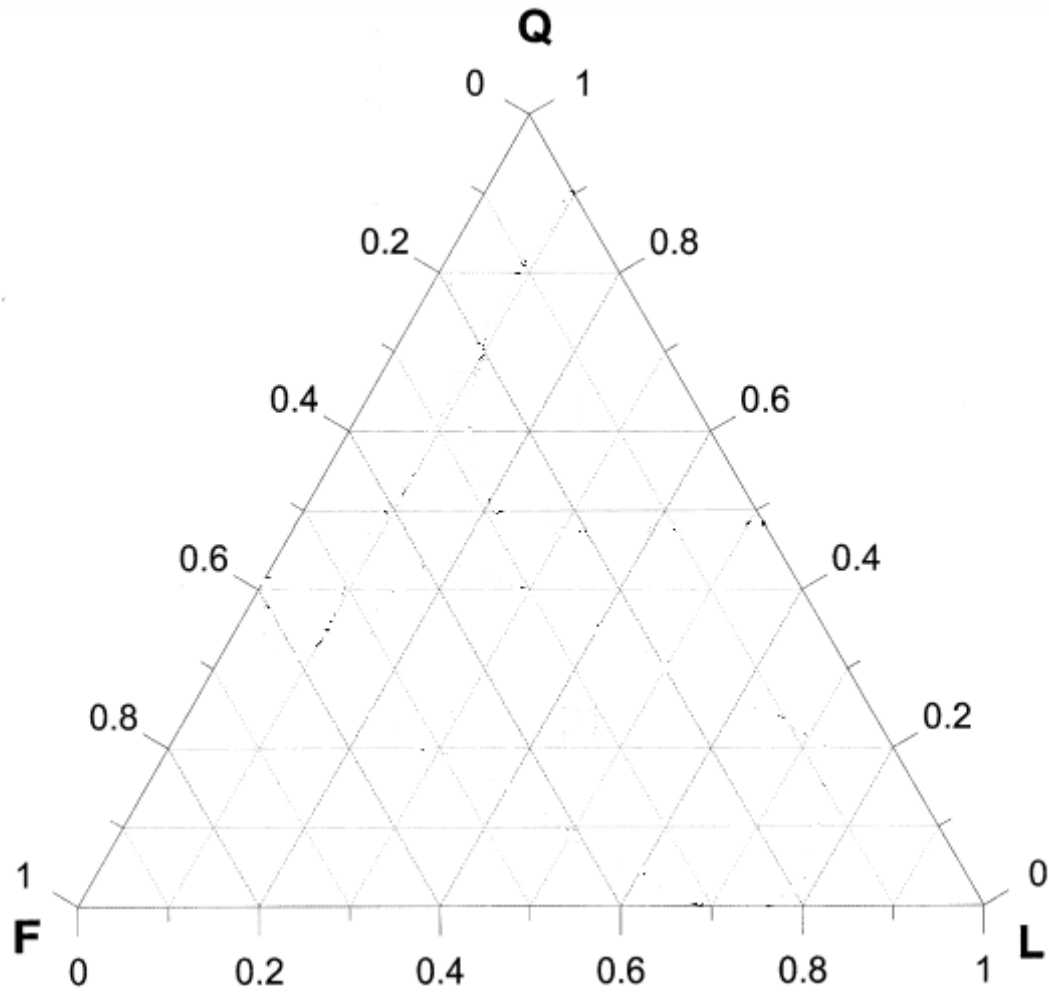


Figure 3: Ternary diagram for sandstone composition

- b) Using the classification scheme which is shown in figure 4, determine the type of the each sandstone sample according to its constituent elements and write each in table 1.
(2.5 Marks)

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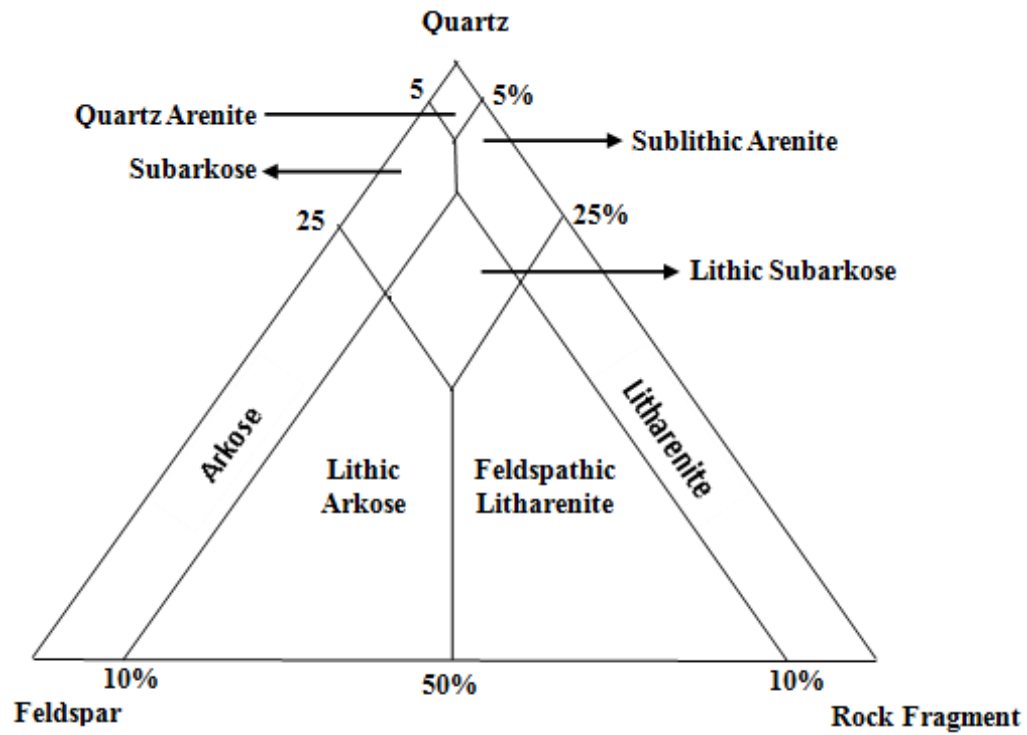


Figure 4: Sandstone composition ternary diagram

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Task 5:

(3 Marks)

Complete the phrases in the table below.

(Each item has 0.25 Mark)

1. In what Epoch are we currently living?	-----
2. The most recent Eon is....	-----
3. Write the 3 periods in the Mesozoic Era, from oldest to youngest?	-----
4. Sandstone will generally decrease its porosity and permeability with.....	-----
5. Lava flows in Hawaii is an example of.....	-----
6. Write the 3 periods in the Cenozoic Era, from oldest to youngest?	-----
7. In what period are we currently living?	-----
8. Lava flows in the Mid Atlantic Opening is an example of.....?	-----