**Salahaddin University Sedimentary Petrography Date 27 /02 / 2023**

**College of Science 2st Semester Examination 3rd Class**

**Earth Sciences & Petroleum Department Time Allowed 80 mins.**

**Q1**/ **Say True or False in front of these sentences and corrected underline:**

 1-Compaction and clay cementation is more dominant than other diagenetic in Ora Formation.

 2-A solution of Cobalt nitrate is a best methods to distinguish heavy from light minerals.

 3-Stable conditions of oligomict conglomerate is mainly find in recycled orogeny.

 4-Textural maturity is refers to relative abundance of stable to unstable grains.

 5-Debris flow dominated near-shore in Daxing Conglomerate matrix supported conglomerate.

 6-Sandstnoes contain at least 95% of quartz grains is referred to sub-arkosic sandstone.

 7-Fluid inclusions temp. of Q3 in Ora Formation and indication of dolomitization conditions.

 8-Greywacke is refers to sands with matrix more than 15%.

 **(16 marks)**

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 **Q2/ Contrast between the following sentences below:- (Answer Three only)**

1-Gentic **&** Empirical classification of quartz grains.

 2-Primary **&** Secondary recrystallization in polycrystalline quartz grains (Young, 1976).

 3-Depositional fabrics **&** diagenetic fabrics.

 4-Cement **&** Matrix. **(15 marks)**

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 **Q3/Answer the following sentences below:**-

 1-The importance and significance of heavy minerals study.\*

 2-Sketch diagram of diamond diagram by Basu et al., (1975).

 3-Mention factors influence the concentration segregation of gravel in nearshore (Clifton,2003).

  **(18 marks)**

*Good Luck Examiner*

 *Dr.Muhamed F.Omer*

 *Assistant Professor of Sedimentology*

**Typical Answer**

Q1/

 1-**Compaction and quartz cementation** is more dominant than other diagenetic in Ora

 Formation. **False**

 2-Astating of Cobalt nitrate is best methods to **distinguish types of feldspars** . **False**

 3-Stable conditions of oligomict conglomerate is mainly find in **epicontinental seas. False**

4**-**Textural maturity is refers to **relative abundance of matrix and degree of rounding and**

 **sorting. False**

5-Debris flow dominated near-shore in Daxing Conglomerate is matrix supported conglomerate.

 **True.**

 6-Sandstnoes at least 95% of quartz grains referred to **quartz arenite sandstones. False**

7-Fluid inclusions temp. of Q3 in Ora Formation and indication of **hydrothermal burial**

 **conditions.** **False**

8-Greywacke is refers to sands with matrix more than 15%. **True**

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**Q2/ Contrast between the following sentences below:-**

1-Gentic & Empirical classification of quartz grains.

*1st Genetic classification developed by Krynine ( 1947).* An attempt is made of allot each quartz grains to a specific environment of formation: plutonic, volcanic, schistose, stretched, metaquartzite, reccrystallized metaquartzite, and hydrothermal. Based on inclusions and grain shape. *2nd Empirical classification by Folk(1974)* based on two categorizes a- by extinction include straight extinction, slightly undulose extinction and strongly undulose extinction b-Inclusions include abundant vacuoles, rutile needles and a few microlit*e.*

 2-Primary & Secondary recrystallization in polycrystalline quartz grains (Young, 1976).

 **Primary Recrystallization** : small 50mu, non-undulose extinction, smooth crystal boundaries, *Unstable grains*.

 **Secondary Recrystallization** : developed large grains , non-undulose extinction, smooth

 crystal boundaries, *Stable grains*.

3-Depostional fabrics & diagenetic fabrics.

 *Depositional fabrics* : Grain orientation, grain size, grain identification, Modal composition,

 provenance.

 *Diagenetic fabrics:* M. Compaction, Ch. Compaction, cementation, dissolution, replacement.

4-Cement & Matrix

 **Matrix** :The smaller or fine-grained, constituents material enclosing or filling the interstices between the larger grains or particles of the sediments. They often consist of argillaceous material or calcareous mud (micrite).

 **Cement**: The cement of the terrigenous sediments comprises the post-depositional (diagenetic) precipitated mineral material that occur in the spaces among the individual grains, there by binding the grains together as a rigid, coherent mass( ex.. lithification of the rocks ) .The most common cements are silica ( quartz, chalcedony, opal), carbonates ,Calcite, dolomite and siderite

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 **Q3/Answer the following sentences below:**-

 1-The importance and significance of heavy minerals study.

1- Provenance.

2-The climate of the source are.

3-Hydraulics of the transport agent.

4-Stratigraphic correlations.

5-Trace element transport path, maps sediment transport paths and to outline bodies.

6-Zircon geochronology is another method for determining dating sediments refers to Precambrian and Cambrian.

7-Its also can be used for facies correlations indicating sedimentary dispersal from particular source areas which undergoing tectonic evolution.

 2-Sketch diagram of diamond diagram by Basu et al., (1975).



 3-Mention factors influence the concentration of gravel in nearshore segragation (Clifton,2003).

1-Selective winnowing of associated sand.

2- Differential transport under shoaling waves or other processes.

3-Fluctuations of physical energy

4-Seafloor morphology.