

- B. Comparison with areas of modern (today) depositional environments (e.g., beaches).
- C. Comparison with areas of ancient (long past) depositional environments (e.g., ancient beaches).
- D. None of these.
- E. All the above.

• A braided river channel (1 mark).

- A. Usually has a relatively narrow and deep cross section.
- B. Usually is the most common type of natural channel in the world.
- C. Usually is dominated by suspended load sediment types.
- D. Usually is found only in arid climate regions.
- E. Usually has a steeper longitudinal gradient than a meandering stream.

• Match the environment with the usual components within it (1 mark).

- 1. Transitional environments.
- 2. Marine environments.
- 3. Continental environments.
- A. streams, lakes, glaciers, floodplains, alluvial fans, aeolian dunes.
- B. beaches, tidal flats, spits, barrier islands, deltas.
- C. shallow vs. deep types, coral reefs, continental slope, graded beds.

**3. Discuss in detail the following items (9 marks):**

- A. Paleocurrent patterns as a diagnostic defining parameter of a sedimentary facies (3 marks).
- B. The three defining parameters of a sedimentary environment (3 marks).
- C. Environments of deposition, erosion and equilibrium (3 marks).

**4. Write briefly on the following topics (9 marks):**

- A. The alluvium of meandering rivers (3 marks).
- B. Geometry as a diagnostic defining parameter of a sedimentary facies (3 marks).
- C. The relationships between sedimentary environment and sedimentary facies (3 marks).

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Good luck

Dr. Abdalla El Ayyat

B. A sedimentary facies is the product of a depositional environment, a special kind of sedimentary environment.

C. A sedimentary facies is defined as any aerially restricted part of a designated stratigraphic unit which exhibits characters significantly different from those of other parts of the unit.

D. All the above.

E. Both (b) and (c).

F. None of the above.

• Trace fossils (biogenic sedimentary structures) are used as facies diagnosis because (1 mark):

A. They undoubtedly occur in situ.

B. Recent and ancient sediments show that various assemblages of trace fossils are specific to environments and have changed little through geological time.

C. It is not always easy to be sure that a fossil lived in or on the sediment in which it was buried.

D. Both (a) and (b).

E. None of the above.

• Which of the following features in a sedimentary rock can be used to interpret its depositional environment (1 mark):

A. Sedimentary structures.

B. Types of fossils.

C. The types of minerals.

D. The size, shape and surface texture of the sedimentary grains.

E. All of the above features.

F. Both (b) and (d).

• Continental environments include all of the following except (1 mark).....

A. Lake beds.

B. River beds.

C. Glacial deposits.

D. Coral reefs.

E. Alluvial fans.

• Which one of the following can **NOT** be determined from an understanding of the conditions under which sedimentary rocks form (1 mark).

A. Age of the rock.

B. Method and length of sediment transport.

C. Origin of the rock's component particles.

D. Environment of deposition.

• How do we use composition and textures of sedimentary rocks as a record of the "environment" of sediment deposition (1 mark)?

A. Comparison with areas of modern (today) erosional environments (e.g., mountain tops).

- B. Comparison with areas of modern (today) depositional environments (e.g., beaches).
- C. Comparison with areas of ancient (long past) depositional environments (e.g., ancient beaches).
- D. None of these.
- E. All the above.

• A braided river channel (1 mark).

- A. Usually has a relatively narrow and deep cross section.
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- A. The alluvium of meandering rivers (3 marks).
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- C. The relationships between sedimentary environment and sedimentary facies (3 marks).

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Good luck

Dr. Abdalla El Ayyat

Geology Department Faculty of Science Assiut University		Time: 2 Hours August 2017 Summer course
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Summer Semester Examination  
**Sedimentology & sedimentary environments ((327G))**  
 Students: 3<sup>rd</sup> level of Geology, all branches

**Part One: Sedimentology (25 marks)**

Answer three questions only out of the following

**A. True or false (8 marks).**

1. The most abundant types of sedimentary rock are conglomerates (1 mark).
2. The degree to which sediment particles become rounded depends on their hardness, how far they are transported, and the energy of their collisions with other particles (1 mark).
3. Detrital sedimentary rocks are classified on the basis of their particle sizes (1 mark).
4. Laminations are thicker than beds (1 mark).
5. Quartz is very stable, so that it is the most common mineral in sedimentary deposits (1 mark).
6. Cubic packing in medium sand has a porosity of about 48%, whereas rhombohedral packing for the same sand will have a porosity of about 26% (1 mark).
7. The tendency for variations in current velocity to segregate sediments on the basis of particle size is called lithification (1 mark).
8. Shale refers to a rock formed from sand sized material (1 mark).

**B. Choose the correct answer (8 marks).**

1. What is the name of the sedimentary structure developed on the top of bedding plain by an oscillatory motion of water (graded bedding - cross-bedding - symmetric ripple marks - asymmetric ripple marks) (1 mark).
2. Rounding is (the grinding away of sharp edges and corners of rock fragments during transportation - the relative sphericity of a grain - weathering of sharp edges and corners of bedrock exposed at Earth's surface - all of these) (1 mark).
3. A layer in which the grain size changes vertically through the layer is called (foliated - cross-bedded - graded bedding - is not observed in nature) (1 mark).
4. Features that form in a sedimentary rock at the time of deposition or immediately after are called (sedimentary features - sedimentary structures - geopetal structures - horizontal bedding - sedimentary rocks) (1 mark).
5. In a triangle for the mineralogical classification of sandstones, the three corners (apices) indicate the content of quartz, feldspar and rock fragments. What is the content of quartz if your sample is located on the feldspar apex (100% - 50% - 33.33% - 0% - none of the previous) (1 mark).
6. What is the difference between a breccia and a conglomerate (breccias are coarse grained and conglomerates are fine grained - conglomerates are coarse grained and



breccias are fine grained - breccias have rounded fragments and conglomerates have angular fragments - breccias have angular fragments and conglomerates have rounded fragments) (1 mark).

7. Which of the following sedimentary structures would indicate deposition had occurred in shallow water with cycles of drought (graded bedding- ripple marks - mud cracks - cross bedding) (1 mark).

8. What happens to the porosity of sediments during cementation (increases - decreases - stays the same) (1 mark).

**C. Write in detail on the following items (9 marks).**

1. Dunham classification of limestones (1962) (3 marks).

2. Different agents of sediment transport (3 marks).

3. Non-skeletal limestone grains (3 marks).

**D. Discuss briefly the following topics (9 marks).**

1. Pyroclastic components (Tephra) (3 marks).

2. Different types of load structures (3 marks).

3. The differences between paraconglomerates and orthoconglomerates (3 marks).

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**Part Two: Sedimentary environments (25 marks)**

Answer three questions only out of the following

**1. True or false (8 marks):**

- a. It appears that depositional sedimentary environments are predominantly terrestrial (1 mark).
- b. Alluvial environment is an example of a shoreline/transitional environment (1 mark).
- c. Larger grain sizes like gravels and sands tend to show a calm energy environment (1 mark).
- d. On land, environments of equilibrium are represented by the great peneplains of the continental interiors (1 mark).
- e. A sedimentary environment may be a site of erosion, non-deposition, or deposition (1 mark).
- f. Understanding the environment of deposition of a sedimentary rock requires study of modern environments (1 mark).
- g. A meandering river system has a unidirectional current flow; marine tidal channels have bidirectional but aeolian environment has polydirectional current flow (1 mark).
- h. Trace fossils are good environmental indicators because they are in situ features and they are not transported (1 mark).

**2. Choose the correct answer (8 marks):**

• A sedimentary facies is defined as (1 mark).....

A. A mass of sedimentary rock which can be defined and distinguished from others by its geometry, lithology, sedimentary structures, paleocurrents and fossils.

Answer the following question(illustrate your answer by drawing as you can)

1- First Question (10 Marks, 2 Marks for each)

Choose the correct answer:

i- Graded bed can be formed in ..... Environment.

- a- Stream    b- lacustrine    c- tempestites    d- Eolian

ii- Field work include sampling of rock types for .....

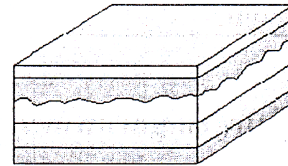
- a- elemental analysis                      b- geochronology  
c- fossil identifications                      d- all of the previous

iii- Only one instrument do not use for measuring the angles in a traverse

- a- compass    b- chain    c- theodolite    d- total station

vi- The figure at the right shows .....

- a- Paraconformity    b- angular unconformity  
c- nonconformity    d- disconformity



v- Which of the following can be used to determine paleocurrent direction

- a- mud cracks                                      b- grain size  
c- cross bedding                                      d- turbidity currents

2- Second Question: (10 Marks, 5 Marks for each)

i- Discuss the stratigraphic cross section.

ii- Compare between: symmetrical and asymmetrical ripple marks (illustrate your answer by drawing)

3- Third Question (10 Marks, 2.5 Marks for each)

i- Write only three instruments which are used in the measurements of angles.

(3 Marks)

ii- Discriminate between burrowing and boring.

(3 Marks)

iii- Define only two of the following terms:

(4 Marks)

- a- intraforaminal conglomerate    b- datum section    c- tectonic structure



4- Fourth Question (10 Marks)

Answer only two of the following:

- i- Discuss the field criteria of unconformities.
- ii- Summarize the types of rocks.
- iii- Outline the types of rocks contacts.

5- Fifth Question (10 Marks)

Write the name and the implication of the following geologic structure photographs. Try to redraw each one again.

Photo no. 1



Photo no. 2

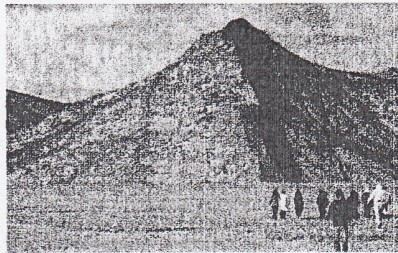
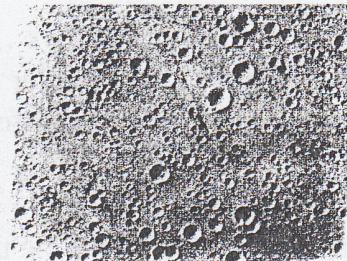


Photo no. 3



Photo no. 4



----- GOOD LUCK -----

Prof. Dr. Nageh A Obaidalla





Final exam, third level (Petroleum Geology Students)  
Micropalaeontology and Palynology (PG 313)  
Summer 2017

Total score: 50 marks

Time allowed: 2 hours

**Part I: Micropalaeontology (25 marks)**

**Answer the following questions:**

- 1- Compare between Radiolaria and Ostracoda in: Systematic position - environmental habitat - shell wall - shell shape - mode of life (5 marks)
- 2- Mark by (Yes) or (No) and then discuss four only from the following: (10 marks)
  - a- Nummulitids are rock forming fossils in the Paleogene.
  - b- Benthic foraminifera live floating in the marine water column.
  - c- Calcareous shells of fossils are preserved below the CCD.
  - d- The wall structure of all microfossils groups is calcareous.
  - e- Abyssal Ostracods are marked by the occurrence of eye tubercles.
- 3-
  - a- Describe the different types of the shell walls in Foraminifera. (2.5 marks)
  - b- Explain the effect of salinity on distribution of the foraminiferal taxa. (2.5 marks)
- 4- Illustrate by drawings only one of the following: (5 marks)
  - a- Hinge in Ostracoda.
  - b- Alternation of generations in Foraminifera (dimorphism)

**Part II: Palynology (25 marks)**

**I- Answer the following questions:**

**Question No. 1: Write on two only from the following (5 marks; 2.5 marks each)**

- a- Biostratigraphic significance of dinoflagellates..
- b- Ornamentation on spores walls.
- c- Extraction of small palynomorphs from rock matrices.

**Question No. 2: Choose if the following are (right) or (wrong): (10 marks; 1 mark each)**

- c- Dinoflagellates have faster evolution rates than spores.
- a- Relative abundance data sets are more accurate than data from accumulation rates.
- b- Marine environments do not preserve terrestrial palynomorphs.
- d- Light microscopy is used to study details of surface features of palynomorphs.
- e- Fossil palynomorphs can be applied in paleoecology inferences.
- f- Small palynomorphs include wide range of organic-walled palynomorphs up to 400  $\mu\text{m}$  in size.
- g- A scolecodont can be considered a palynomorph.
- h- Dinoflagellates are reproduced only by vegetative reproduction.
- i- State of preservation and age of the material may affect reliable palynological investigations.
- j- The fossil record of dinoflagellate cysts belongs to the order Dinophysiales.

**II- Answer ONE question only from the following:**

**Question No. 3: Write on: (10 marks; 5 marks each)**

- a- Main differences between gonyaulacoid and peridinioid dinoflagellates.
- b- Different kinds of palynomorphs.

**Question No. 4: Write on: (10 marks; 5 marks each)**

- a- Kerogen types.
- b- Openings in pollen grains.

Good Luck

Examiners: Prof. Dr. Magdy S. Mahmoud; Prof. Dr. Nageh A. Obaidala

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