



<u>FACULTY</u>	: Science
<u>DEPARTMENT</u>	: Geology
<u>CAMPUS</u>	: APK
<u>MODULE</u>	: GLG22A2 SEDIMENTOLOGY AND STRATIGRAPHY
<u>SEMESTER</u>	: First/ Second
<u>EXAM</u>	: Special Exam

<u>DATE</u>	: Jul 2021	<u>SESSION</u>	:
<u>ASSESSOR(S)</u>	: DR C VORSTER PROF M De KOCK		
<u>MODERATOR</u>	: PROF Z JINNAH (WITS)		
<u>DURATION</u>	: 3 HOURS	<u>MARKS</u>	: 120

NUMBER OF PAGES: 3 PAGES

INSTRUCTIONS:

1. Answer ALL THE QUESTIONS.
 2. Number your answers clearly
 3. Answer section A and section B in separate books
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SECTION A: (60 MARKS)**QUESTION 1 (15 MARKS)**

Give ONE WORD for the following sedimentological definition or statement (1 marks each):

- 1.1) A matrix supported conglomerate composed of clast of many different lithologies
- 1.2) Sand-sized pieces of pre-existing igneous, metamorphic and sedimentary rocks which could form part of the composition of a clastic sedimentary rock.
- 1.3) It is a measure of the proportion of resistant or stable minerals present in a clastic sedimentary rock compared to less stable/resistant minerals.
- 1.4) A clastic sedimentary rock composed of a mixture of silt and clay sized particles.
- 1.5) Silt and clay sized (<0.06mm) volcanogenic particles contained in volcanogenic rocks.
- 1.6) A dome-like mass of biochemically precipitated carbonate rock built up by bacterial or microbial mats.
- 1.7) The common name for the trace fossils caused by animal activity in the deeper water of the outer bathyal zone of marine environments and which can be identified mostly from broad looping feeding traces.
- 1.8) Spherical bodies of calcium carbonate less than 2mm in diameter.
- 1.9) The term used to refer to spherical, sub-spherical and ovoidal masses of opal, chalcedony and quartz.
- 1.10) A non-clastic sedimentary rock which contains high amounts of phosphate minerals (15 -20% P₂O₅).
- 1.11) Particles contained in coal which are seen as the organic equivalent to minerals in a rock.
- 1.12) The type of fluid flow where molecules in the fluid move in all directions but with a net movement in the transport direction
- 1.13) The maximum depth at which a water wave's passage causes significant water motion and is considered to be equal to ½ the wavelength.

1.14) A large scale bedforms which forms similar to a ripple.

1.15) The mark/impression made in the base of a bed as a results of an object being carried in a flow over a bed.

QUESTION 2 (10 MARKS)

How would you as a geologist objectively define/describe a clastic sedimentary rock?
What parameters would you use?

QUESTION 3 (8 MARKS):

Explain the difference between a pyroclastic fall and a pyroclastic surge deposit. You may make use of sketches to support your answer.

QUESTION 4 (9 MARKS):

How do marine evaporates form? You may make use of sketches to explain the process.

QUESTION 5 (10 MARKS):

Briefly explain how banded iron formation is formed and why it is unique to the Precambrian.

QUESTION 6 (8 MARKS):

Make a sketch of a current ripple wherein the following features are clearly illustrated.

- Lee- and stoss side
- The formation of foresets
- The movement of particles in the flow
- The current direction

END OF SECTION A

SECTION B: (60 MARKS)**QUESTION 9 (13 MARKS)**

9.1) Clearly define hemipelagic and pelagic sediment and how they are classified. (8 marks)

9.2) Draw a diagram to illustrate the global distribution of these sediments. (5 marks)

QUESTION 10 (10 MARKS)

Sketch and label clearly a single turbidite deposit that contain all five elements of a Bouma sequence (10 marks)

QUESTION 11 (12 MARKS)

Define or describe each of the following terms (illustrate your answer where possible).

11.1) Skolithos (2 marks)

11.2) Estuary (2 marks)

11.3) Dropstone (2 marks)

11.4) Foreshore (2 marks)

11.5) Walther's law (4 marks)

QUESTION 12 (20 MARKS)

Discuss the controls on the deposition of alluvial fan systems.

QUESTION 13 (5 MARKS)

Name five distinguishing features that can be used for the identification of continental glacial deposits.

END OF SECTION B