

# FACULTY OF ENGINEERING AND THE ENVIRONMENT DEPARTMENT OF GEOMATICS AND SURVEYING

#### **GEOLOGY**

#### **EGS 3210**

### **Final Examination Paper**

June 2023

This examination paper consists of 4 pages

Time Allowed : 3 hours

Total Marks : 100

Examiner's Name : Mr. N Ndlovu

### **INSTRUCTIONS**

- 1. This question paper SECTION A and SECTION B. Answer question 1 on section A and 3 questions on section B.
- 2. Each question carries 25 marks.
- 3. Answer each question on a new page and write as eligible as possible.

## **Additional Requirements**

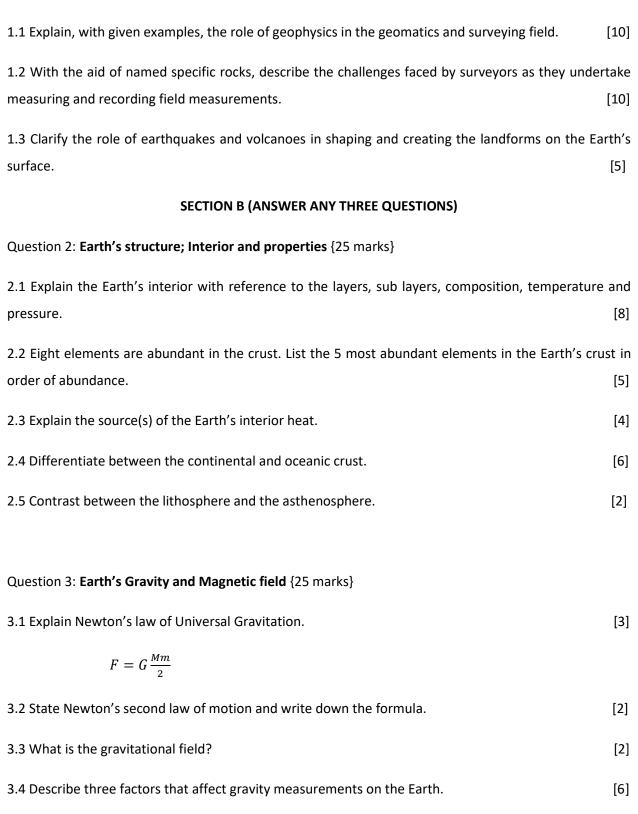
## None

## **MARK ALLOCATION**

Question 1 to 7	25Marks	
Part Questions	As shown in each part question	
Total Attainable	100	

#### **SECTION A (COMPULSORY)**

Question 1.



3.5 Describe the three components of the Earth's magnetic field.	[6]
3.6 Draw and label the geomagnetic elements.	[4]
3.7 What do the terms remanent and induced magnetizations mean?	[2]
Question 4: Igneous and metamorphic petrology {25 marks}	
4.1 With the aid of a fully labelled diagram, explain the rock cycle.	[8]
4.2 What are the three sources that melt the asthenosphere in the formation of magma?	[3]
4.3 List and explain the three factors that drive metamorphism.	[6]
4.4 Metamorphic rocks are classified by their texture and composition, which also related to grade	. List
the metamorphic rocks from low grade to high grade.	[3]
4.5 With the aid of a diagram(s), explain the formation of the foliation texture in metamorphic rocks.	. [5]
Question 5: Mineralogy and sedimentary petrology {25 marks}	
5.1 Define a mineral.	[2]
5.2 List and explain three physical properties of minerals.	[6]
5.3 List the minerals, from softest to hardest, in the Mohs Hardness scale.	[5]
5.4 Describe the process of sedimentary rock formation, naming the type of sediments that are invol	lved.
5.5 Coal is formed, not from marine organisms, but from the remains of land plants. Describe the pro	cess
of coal formation with reference to all the stages or processes that take place. [6]	
Question 6: Continental Drift, Seafloor Spreading and Plate tectonics {25 marks}	
6.1 Elucidate on the historical evidence that gave rise to the theory of plate tectonics?	[5]

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6.2 Explain how earthqua	akes and volcanoes are i	related to plate boundario	es. What mechanisms are		
responsible for this tectonic activity? [6]					
6.3 Elucidate on why the [3]	oceanic crust rock younge	er at the mid-ocean ridges	than at the ocean trench?		
6.4 Enumerate on what is the cause or what drives plate tectonics?					
6.5 Briefly explain seafloor spreading?					
6.6 Copy and accurately fill the table below.					
Type of crust	Density	Composition(minerals)	Composition(rocks)		
Continental crust					
Oceanic crust					
Question 7: <b>Atmosphere,</b>	Hydrosphere, and Biosph	ere {25 marks}			
7.1 What is the atmosphere, it role, and composition?					
7.2 State the three properties of the Earth's atmosphere.					
7.3 Define weather and list five measurable parameters of weather.					
7.4 With the aid of a clearly labelled diagram, explain the Hydrological cycle.					
7.5 List the three biomes found in Zimbabwe.					
7.6 Biomes are defined by	their unique vegetation a	nd animal life. Briefly expla	in the savanna biome with		
respect to climate, animal	respect to climate, animals, and vegetation.				