Earth Systems 3209 Unit 1 Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions

Earth Science-Geoscience	Astronomy	Geology
Oceanography	Meteorology	Big Bang Theory
nebular hypothesis	inner core;	outer core;
mantle (asthenosphere);	lithosphere (continent)	hydrosphere
lithosphere (Oceanic)	atmosphere	

Review Questions

1. Explain how the Earth is differentiated into layers, and identify each layer.
2. Describe the formation of the universe using the Big Bang Theory
3. Describe the four stages of the nebular hypothesis that led to the formation our solar system
4. Describe the interaction among the hydrosphere, lithosphere, and atmosphere, using one major event.

Earth Systems 3209 Unit 2 Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions (Terms to know)

Uniformitarianism	Catastrophism	absolute (dating) time
relative (dating) time	principle	law
Superposition	Cross-cutting relations	Horizontality
Inclusions	Fossil succession (index fossils)	Unconformities
Varves	Growth rings	Radioactive dating
half-life	isotope	parent elements
daughter elements	radiometric data	sources of error
geologic time scale	fossil	petrifaction by replacement
carbonization	mould and cast	preserved intact (frozen, amber)
imprints (soft tissue)	trace fossils	eons
eras	periods	epochs
Precambrian	Phanerozoic	Palaeozoic
Mesozoic		

Review Questions

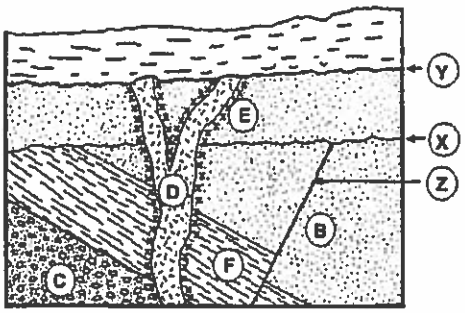
1. Explain how the ideas of catastrophism and uniformitarianism are different. In your answer include what these two philosophies would have believed about geologic time.

2. Using examples, explain the difference between relative time, and absolute time.

3. a) How are half-lives in radioactive isotopes used to determine the age of something?
b) Is there any time when these can't be used, or will give false dates for rocks? Explain using examples.

4. a)You have a rock with a half-life of 200,000 years and there is 40 grams of a 160-gram sample that is parent. How old is the sample?
b) The half-life of element X is 200 000 years. If a sample originally held 256 g of parent isotope and the rock sample has been determined to be 1 million years old, what mass of parent now remains? Show calculations.
c) An organism contained 28 kg of carbon-14. If the half life of carbon-14 is 5730 years, what mass of carbon-14 remains in a fossil of this organism that is approximately 22 920 years old? Show all workings.

5. Use the following diagram to answer some questions about relative age and the ages of layers.



a) Label the ages of the identified letters from the oldest event to the youngest.
Oldest _____ _____ _____ _____ _____ _____ _____ _____ Youngest
b) Accurately name the feature that is identified by the Letter X
c) What Principle helps to tell us how old Z may be?
d) Is letter D a buried lava flow or an intrusion? How did you determine that?

6. Describe the three conditions necessary for fossilization, and explain why you would never find fossils of a worm.

7. List and explain three types of fossil formation.

8. Using the two largest mass extinctions as examples, explain why the dominant life on earth has changed over geologic time.

Earth Systems 3209 Unit 3a Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions (Terms to know)

Atom	ion	element	compound
Molecule	ionic	molecular	metallic
Mineral	silicates	carbonates	halides
Sulfides	sulfates	oxides	native elements
Silicates	carbonates	halides	sulfides
Sulfates	oxides	native elements	
Silica tetrahedron	crystal shape (form)	cleavage	fracture
Hardness	specific gravity	colour	streak
Luster	acid test	taste	magnetism
double refraction	fluorescence	mineralogy	crystallography
geochemistry	gemology		

3. A pencil lead contains the mineral graphite that is composed of pure carbon. A diamond is also composed of pure carbon.
a) How do their values for hardness compare on Moh's Scale?
b) Explain why the difference in hardness exists between diamond and graphite.
4. Based on the definition of a mineral, ice would be considered a mineral and coal would not. Explain why this is true.
5. a) Explain how the specific gravity of a mineral is determined.
b) A mineral sample was studied and the following data obtained. Using the data, determine the mineral's specific gravity.

Mass of Mineral Sample 129.6g
Volume of Water Displaced 18.0 cm3

Earth Systems 3209 Unit 3b Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions (Terms to know)

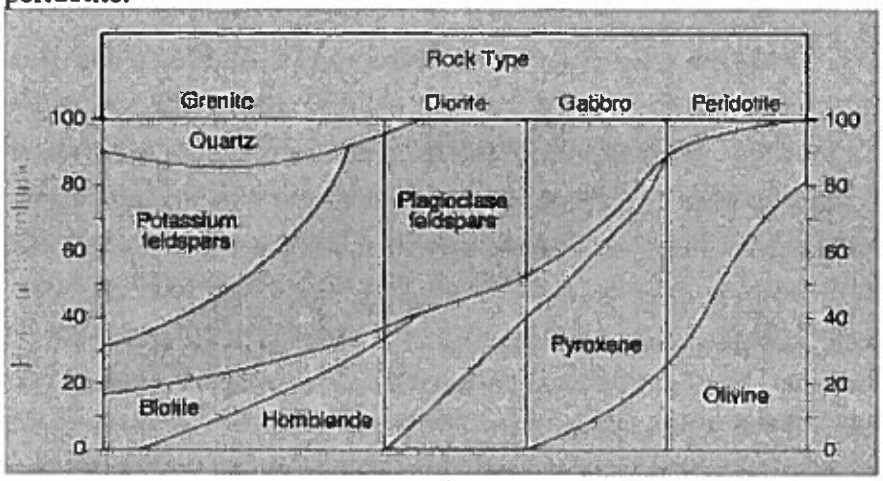
Rock	rock cycle	igneous	mafic
Felsic	rhyolite	granite	andesite
Diorite	basalt	gabbro	coarse-grain (aphanitic)
fine-grain (phaneritic)	glassy (compact and frothy)	vesicular	porphyritic
Bowen's Reaction Series	Kimberlite	Diamond	Metamorphism
Texture	volume change	chemical change	contact
Regional	buried lava flow	subduction zones	Sedimentary Rocks
clastic (detrital)	chemical	biochemical	shale
siltstone	sandstone	conglomerate	breccia
sediment sorting	particle size	fluvial	Flood plains
Deltaic	Alluvial fans	Aeolian dunes	Turbidites
Beaches	glacial	shallow marine	deep marine
Evaporites	halite	gypsum	sylvite
Limestone	dolomite	travertine	coquina
Chaulk	chert	limestone (coral)	coal

Review Questions

6. Briefly describe how a geologist would use texture and mineral composition to determine the type of igneous rock.
7. Explain the difference between regional metamorphism and contact metamorphism within a mountain environment. Include a labeled diagram with your answer.
8. Describe one type of mineral deposit that may be associated with a large igneous intrusion.
9. Describe two things that can be determined by examining the crystal size of minerals in igneous rocks.
10. Distinguish between igneous, metamorphic, and sedimentary rocks by completing the table below.

Rock	Type	Distinguishing feature
		
		
		

11. Using the chart below, compare the chemical composition of a sample of granite with that of peridotite.



12. Describe the difference in the following igneous rock textures: coarse-grain (aphanitic), fine-grain (phaneritic), glassy (compact and frothy), vesicular, porphyritic

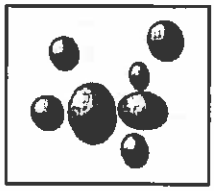
13. Use Bowens reaction series to Describe how cooling rate and mineral composition determine the type of rock you can find.

14. Describe two depositional features of glaciation that can be used to determine the direction of ice movement.

15. Using an example for each, describe the formation of clastic/detrital, chemical and biochemical sedimentary rocks.

16. Use the rock cycle to explain how a sedimentary rock, like conglomerate, can contain small pieces of other sedimentary, igneous, and metamorphic rocks.

17. The diagram below shows a collection of sedimentary samples. Describe the environment in which these samples were formed and explain why they are smooth and have rounded shapes.



18. Explain, using examples, the difference between contact and regional metamorphism. Where would you find each?

19. What is Lithification? Describe the two processes of lithification. Give an example of each.

20. Stratification or bedding is perhaps the most common feature displayed in sedimentary rocks. Describe the conditions and environment necessary for Graded bedding to occur.

21. Explain the difference in how evaporite deposits form, and how precipitate deposits form.

Earth Systems 3209 Unit 4 Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions (Terms to know)

Continental drift	Plate tectonic theory	Convergent boundary
Divergent Boundary	Transform Boundary	Rift Valley
Crustal Deformation	Force	Stress
Compressional	Tensional Shearing	Elastic
Brittle	Ductile	Faulting
Dip slip	Strike slip	Folding
Anticline	Syncline	Earthquake
Seismic wave	Focus	Epicentre
Foreshock	Aftershock	Surfaces waves
Primary waves	Secondary waves	Richter
Modified Mercalli	Amplitude	Intensity
Volcano	Shield	Ash and Cinder
Composite	Pahoehoe	AA

Review Questions

1. Describe the theory of continental drift
2. Describe the evidence to support the theory of continental drift
3. Describe the evolution of plate tectonic theory through the contributions of various scientists
4. Contrast the explanations provided by Wegener and Holmes for the mechanism of continental movement
5. Describe the theory of plate tectonics
6. Describe and give examples of convergent, divergent and transform plate boundaries
7. Describe and give examples of the different types of convergent plate boundaries
8. Describe a rift valley and how it evolves into a divergent plate boundary
9. Describe the evidence which supports plate tectonic theory
10. Describe the geology of the island of Newfoundland, and how it was formed.
11. Describe the types of forces stresses that produce crustal deformation
12. Describe the types of deformation
13. Describe the factors that affect deformation
14. Relate faulting to the factors that affect deformation
15. Describe the two major types of faults and associated forces/stresses
16. Relate folding to the factors that affect deformation
17. Describe the two common types of folds
18. Describe the causes of an earthquake
19. Identify the location of earthquakes and relate them to their plate boundary
20. Describe properties of the different seismic waves
21. Distinguish between earthquake scales
22. Describe how seismographs and resulting seismograms are used to measure seismic waves

23. Describe factors affecting the nature of volcanic eruptions
24. Describe the three types of volcanoes
25. Describe the type of eruption for each volcano type in relation to the different plate boundaries
26. Identify the rocks that form in relation to each type of volcano
27. Distinguish between the types of lava
28. Describe intraplate volcanism as it relates to hotspots
29. Describe the formation of a lava plateau
30. Explain the global effects of volcanic activity

Earth Systems 3209 Unit 5 Test Review

Please answer the following completely and on your own paper. You may type them, or handwrite them legibly.

Definitions (Terms to know)

Economic Minerals	Ore	Magmatic (layered and disseminated)
Hydrothermal (vein deposits)	Placer	Secondary enrichment (sedimentation)
Metamorphism	Floatation	Gravity separation
Heap leaching	Pyromet	Hydromet
Petroleum	Crude Oil	Hydrocarbons
Diagenesis	Catagenesis	Metagenesis
Source rock	Reservoir rock	Cap Rock
Anticline trap	Fault trap	Salt dome trap
Stratigraphic trap	Distillation	Cracking
Reforming		

Review Questions

1. Describe the different types of economic mineral deposits
2. Identify the 2 types of mines
3. Identify exploration techniques
4. Describe techniques for processing ore deposits
5. Describe the origin and the process of formation of petroleum
6. Identify the three phases in the evolution of organic matter to petroleum
7. Describe the components involved in the formation of petroleum traps
8. Describe the types of petroleum traps
9. Describe the distribution of petroleum in a reservoir.
10. Describe the two main means of extracting petroleum from Earth
11. Describe the methods of refining petroleum
12. Describe sustainable development in relation to the use of Earth's resources
13. Identify and describe core components involved in the sustainable development of Earth's resources