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TOTAL	

GEOLOGY 101 FINAL EXAM THURSDAY 5TH FEB 1998
SECTIONS 1, 3 C.D. WALLEY

(1)

NAME _____ NUMBER _____

Answer all Sections. Read instructions carefully. Time allotted. 2 hours

Section 1 30 marks True or False 1 mark each. If false you must correct them.

T F

- 1) The earth's core is believed to made of ultramafic rock
- 2) Genera are grouped into orders, orders are grouped into families.
- 3) The Sun is made up of largely of hydrogen and oxygen
- 4) One of the largest extinct flying reptiles was *Australopithecus*
- 5) Most of the western margin of North and South America is dominated by subduction tectonics.
- 6) The extinction at the end of the Permian was the most major one to occur during the Phanerozoic
- 7) Linnaeus was the father of taxonomy.
- 8) Ornithiscians and Saurischians are the two main classes of marine reptile in the Mesozoic
- 9) The Atlantic is an opening ocean with very few subduction zones but the Pacific is a closing ocean with many subduction zones.
- 10) The first amphibians came from the lobe finned fishes
- 11) DNA is a complex chain of carbohydrate molecules
- 12) Pelagic or nektonic fossils tend to make better zone fossils than benthonic ones
- 13) Good zone fossils have a wide time range and a wide geographic range
- 14) Evolution can be expected to be at a faster rate with organisms that bred rapidly.
- 15) The fossil *Archaeopteryx* formed an important part of Darwin's evidence in his book "The origin of Species by Natural Selection"
- 16) The earliest crust on earth was probably mafic in composition.
- 17) Hard skeleton metazoans appeared first around 540 Ma, that is, the start of the Carboniferous
- 18) Two hundred grams of a parent isotope with a half life of fifty years will have converted to fifty grams of the daughter isotope after a hundred years .
- 19) The C14 or radiocarbon method is unique in methods of radiometric dating in that it does not depend on the parent daughter ratio.
- 20) The traditional view of Evolution as occurring by Punctuated Equilibria has now been challenged by the modern view of Phyletic Gradualism.



- | | T | F |
|---|--------------------------|--------------------------|
| 21) Lebanon has excellent Paleozoic fish fossils | <input type="checkbox"/> | <input type="checkbox"/> |
| 22) Mafic lavas are rich in silica and are common on continents | <input type="checkbox"/> | <input type="checkbox"/> |
| 23) In the mountains of Lebanon thick Jurassic and Cretaceous limestones occur. | <input type="checkbox"/> | <input type="checkbox"/> |
| 24) The oldest rocks on earth are around 3.5 billion years old. | <input type="checkbox"/> | <input type="checkbox"/> |
| 25) Mars is the fourth planet out from the Sun | <input type="checkbox"/> | <input type="checkbox"/> |
| 26) The Pan- African event was a major Late Precambrian tectonic event over Africa and Arabia | <input type="checkbox"/> | <input type="checkbox"/> |
| 27) The Fungi, Animal and Plants are the three kingdoms of the Monera | <input type="checkbox"/> | <input type="checkbox"/> |
| 28) An angular unconformity is evidence of a period of tilting or folding | <input type="checkbox"/> | <input type="checkbox"/> |
| 29) All heterotrophic organisms photosynthesise | <input type="checkbox"/> | <input type="checkbox"/> |
| 30) In order to survive Geology 101 you need a vestigial brain. | <input type="checkbox"/> | <input type="checkbox"/> |

Section 2 15 Marks

Fill in the table with a tick in the appropriate place for the time period when the event or fossil group listed occurred.

ITEM	HADEAN/ ARCHEAN	PROTEROZOIC	PALEOZOIC	MESOZOIC	CENOZOIC
1 The oldest rocks	✓				
2 Graptolites					
3 Ammonites					
4 The formation of the Himalayas					
5 Ichthyosaurs					
6 Widespread chalk					
7 The breakup of Pangea					
8 The first land plants					
9 The first stromatolites					
10 The formation of Pangea					
11 Trilobites					
12 Ediacara type fossils					
13. The first amphibians					
14 Plesiosaurs					
15 The first land mammals					
16 The Burgess Shale					
17 Goniatites					
18 The closure of the Tethys					
19 Hominids					
20- Grass					

Section 3 30 marks Examine the diagram of an imaginary part of the world on the attached sheet. Note the letters applied to the various features A B, C etc

PART A: 15 marks Against the following list put the most appropriate letter. Each letter can only be used once so chose the best spot. Take your time.

- 1) A continental slope -----
- 2) A trench -----
- 3) A continental shelf -----
- 4) A mantle - crust boundary zone -----
- 5) A lithosphere - asthenosphere boundary zone -----
- 6) A site of deep earthquakes -----
- 7) A zone of seafloor spreading -----
- 8) A place where basalt magmas form -----
- 9) A continental magmatic arc -----
- 10) A fold and thrust belt -----
- 11) A zone where andesite volcanoes are currently being erupted. -----
- 12) An active subduction zone -----
- 13) Remains of an old subduction zone. -----
- 14) Subducting ocean floor -----
- 15) A line of the major thrust fault at the surface between two plates -----

PART B: 15 marks *Consider carefully the following pieces of information then answer the following questions.*

- The diorites and andesites marked (X) occur all along the western part of the Great Mountain Range. They never occur to the east of the range and are all 140 to 50 Ma in age.
- Eastland and Westland have two very different sets of land mammals until 70 million years ago. After 70 Ma both Eastland and Westland have the same land animals.

a) Why are the andesites and diorites only found to the west of the mountain range?

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.....

b) Why do you think the land mammals started to become similar around 70Ma?

.....

c) Why do you think the andesites and diorites stopped around 50 ma?

.....

d) Shortly after the start of the last glaciation (around 2.5 Ma) the different mammal groups in Westland and Eastland started to become different again. Why might this be?

.....

- e) Draw below labelled sketch *cross section* of what this area will look like in another 50-100 million years.
- i) if the spreading rate of the Big Sea is **greater** than the subduction rate

- ii) if the spreading rate of the **Big Sea** is less than the subduction rate

Section 4 26 marks

Answer Two Questions

Answer in detail all the parts of all the questions you choose. Use answer books.

- 1) What was the K/T event? What is the currently favoured idea to explain it? Why, from our point of view, was it a good thing?
- 2) Consider the Middle East. Explain geologically the origin of four of the following a) The Red Sea, b) The Dead Sea Fault System, c) The Taurus Ranges, d) The Arabian Shield, e) the deep sea floor of the eastern Mediterranean.
- 3) Why is the moon a better place than the earth to study the Hadean? Why are Precambrian fossils so rare?
- 4) Give at least three reasons (with examples) why studying fossils is useful.
- 5) What were the major developments in a) plants, b) vertebrates during the Silurian to Carboniferous? How might these be related to the climatic changes caused by the global plate tectonic situation at this time where a single supercontinent was forming out of lots of smaller continents?.

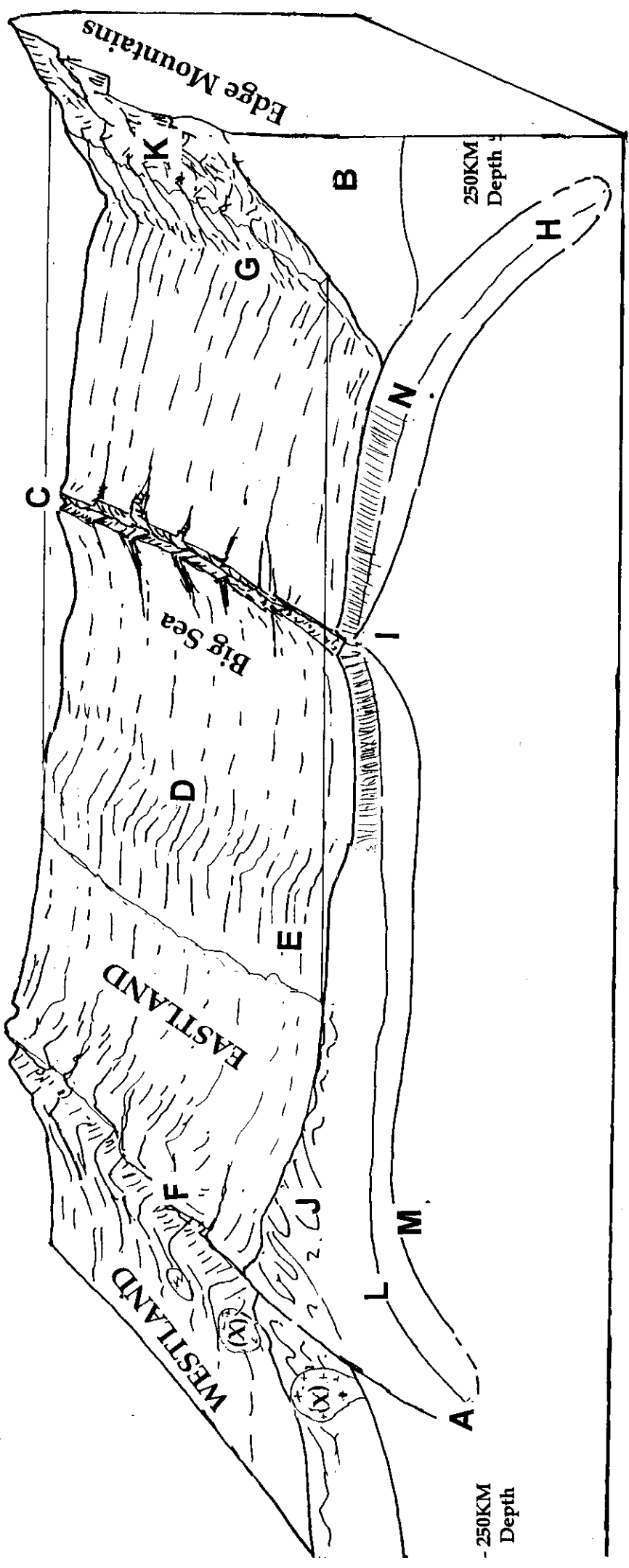
Best wishes,

C. D. Walley Wednesday, February 04, 1998

EAST

WEST Great Mountains

WEST



-250KM Depth

250KM Depth