



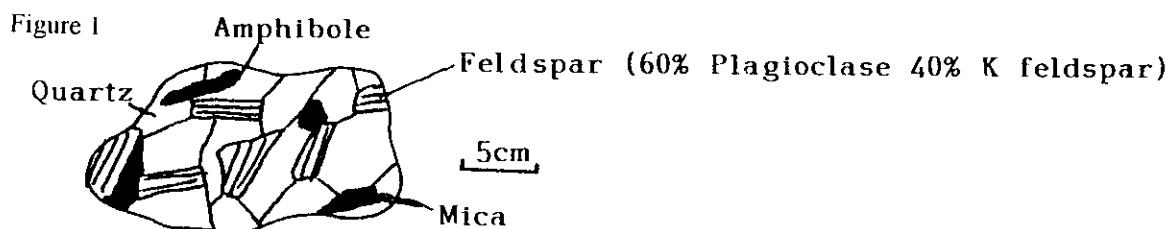
Geology 201 Final Exam, Spring 1998/1999

Exam rules apply.
Time allowed: Two hours

Section A: (60 marks)

Answer the questions on the sheet provided. Note that **two** marks will be given for each correct answer and **half** a mark will be deducted for each incorrect answer.

- The mineral Apatite is an example of a:
 - Clay.
 - Phosphate.
 - Carbonate.
 - Double chain silicate.
 - Sheet silicate.
- Minerals are defined on the basis of their:
 - Physical properties.
 - Colour.
 - Origin.
 - Atomic structure and chemical composition.
 - Chemical composition and origin.
- The Plagioclase feldspar group of minerals includes two end members these are:
 - $KAlSi_3O_8$ and $NaAlSi_3O_8$
 - $KAlSi_3O_8$ and $CaAl_2Si_2O_8$
 - $NaAlSi_3O_8$ and $CaAl_2Si_2O_8$
 - Mg_2SiO_4 and $NaAlSi_3O_8$
 - Mg_2SiO_4 and $Ca(Mg,Fe,Al)(Si,Al)O_3$



- Figure 1 is a line drawing showing the texture and mineralogy of an igneous rock. The rock is best described as:
 - Pyroclastic andesite
 - Obsidian
 - Pegmatitic granodiorite
 - Porphyritic granite
 - Pumice
- A lahar is:
 - A type of basalt
 - A dry ash flow
 - A landslide of basaltic rock
 - A torrential mudflow of wet volcanic debris
 - None of the above



Name.....

10. Figure 2 shows a stratigraphic sequence with four way up criteria (labelled A-D). Which one is the odd one out?
- A
 - B
 - C
 - D
 - None of the above
11. Sandstone comprised of a heterogeneous mix of quartz, feldspar and lithic fragments set in a fine-grained matrix is best described as:
- Quartz arenite
 - Arkose
 - Lithic sandstone
 - Greywacke
 - None of the above
12. The first precipitates to form as seawater starts to evaporate are:
- Carbonates
 - Phosphates
 - Silicates
 - Sulphates
 - Sulphides
13. The texture of metamorphic rocks shows
- That minerals crystallised in a sequence develop interlocking grains
 - Rounded and abraded grains
 - Grains that have been recrystallised and commonly have a preferred orientation
 - A porphyritic texture
 - A clastic texture
14. Which of the following is not the result of metamorphism?
- Conglomerate pebbles deformed into long elliptical shapes
 - Recrystallisation of minerals
 - Development of alignment of minerals within the rock body
 - Chemical decomposition in which oxides are produced
 - Growth of new minerals
15. Regional metamorphism would be best developed
- Above and below a sill
 - In a fault zone
 - Below a lava flow
 - In buried sediment on a stable platform
 - Deep in a folded mountain belt
16. Which metamorphic zone follows the garnet zone in the direction of increasing metamorphism?
- Biotite
 - Staurolite
 - Kyanite
 - Sillimanite
 - Chlorite

Name.....

17. The line labelled Z in figure 3 is

- a. A disconformity
- b. A nonconformity
- c. An angular unconformity
- d. A fault
- e. None of the above

18. The line marked 2 in figure 3 is:

- a. A normal fault
- b. A reverse fault
- c. A dextral strike-slip fault
- d. A sinistral strike-slip fault
- e. None of the above

19. The structure marked 4 in figure 3 is most likely to be composed of:

- a. Sandstone
- b. Granodiorite
- c. Basalt
- d. Hornfels
- e. Obsidian

20. If the rock units and structures were to be written in order from oldest to youngest then the order would be:

- a. I, H, G, F, E, 3, D, C, 1, B, J, K, L, M, N, A, 4, 2
- b. I, H, G, F, E, J, K, L, M, N, 1, 3, D, C, B, A, 2, 4
- c. H, G, F, E, J, K, I, L, M, N, D, C, 1, 3, B, A, 2, 4
- d. H, G, F, E, J, K, I, L, M, N, D, B, C, 3, 1, A, 4, 2
- e. G, F, E, J, H, K, I, L, M, N, D, C, 3, 1, B, A, 4, 2

Figure 4.



C= Cambrian
O= Ordovician
S= Silurian

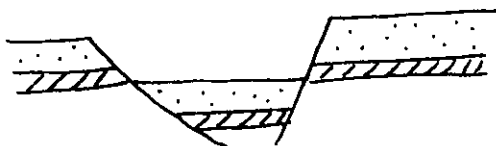
21. The fold shown above is best described as:

- a. Neutral syncline
- b. Antiformal anticline
- c. Antiformal syncline
- d. Synformal syncline
- e. Synformal anticline

22. Three theoretical atoms A (atomic number (an) 12, mass number (mn) 25), B (an 32, mn 64) and C (an 88, mn 157) undergo decay by Beta capture, Beta emission and Alpha emission respectively. The resultant products A', B' and C' are characterised by which of the following?

- a. A' = an 13, mn 24, B' = an 33, mn 64, C' = an 89, mn 159
- b. A' = an 11, mn 25, B' = an 33, mn 64, C' = an 86, mn 153
- c. A' = an 11, mn 24, B' = an 35, mn 64, C' = an 89, mn 158
- d. A' = an 13, mn 25, B' = an 35, mn 64, C' = an 87, mn 153
- e. A' = an 12, mn 24, B' = an 31, mn 60, C' = an 89, mn 158

Figure 5



Name.....

30. In which of the following cases does the law of superposition not apply?

- a. Accretionary prisms
- b. Overturned strata
- c. Wet sequences of shale and sandstone that have been subjected to seismicity
- d. All of the above
- e. None of the above

Answer the questions for section A in the table below. Remember that **two marks** will be given for each correct answer and **half a mark** will be deducted for each incorrect answer.

1	a	b	c	d	e
2	a	b	c	d	e
3	a	b	c	d	e
4	a	b	c	d	e
5	a	b	c	d	e
6	a	b	c	d	e
7	a	b	c	d	e
8	a	b	c	d	e
9	a	b	c	d	e
10	a	b	c	d	e
11	a	b	c	d	e
12	a	b	c	d	e
13	a	b	c	d	e
14	a	b	c	d	e
15	a	b	c	d	e
16	a	b	c	d	e
17	a	b	c	d	e
18	a	b	c	d	e
19	a	b	c	d	e
20	a	b	c	d	e
21	a	b	c	d	e
22	a	b	c	d	e
23	a	b	c	d	e
24	a	b	c	d	e
25	a	b	c	d	e
26	a	b	c	d	e
27	a	b	c	d	e
28	a	b	c	d	e
29	a	b	c	d	e
30	a	b	c	d	e

Section B (20 marks)

Name:

Using **labelled diagrams** and examples explain what is meant by the following: **(Remember no diagram = no grade)**

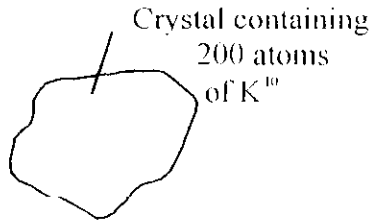
1. Polymerization in silicates
2. A sinistral transpressional fault
3. Ocean-ocean divergence
4. Metamorphic facies
5. A porphyritic andesite

Name.....

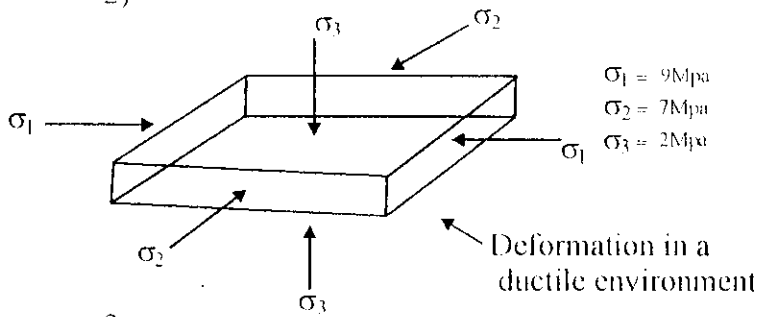
Section C (20 marks)

Using labelled diagrams, and where possible, examples, explain what happens next in each of the following cases. **(Remember: No diagram = No grade)**

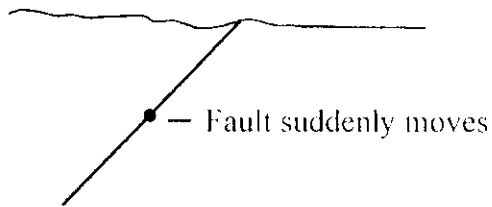
1)



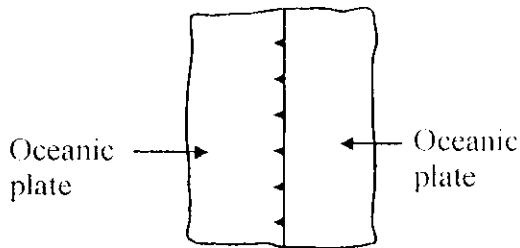
2)



3)



4)



5)

