

Name.....

Geology 201 Final 96/97

Time Allowed: 2 hours
Exam rules apply:

Section A (40 marks)

Answer the questions in this section on the sheet provided. Note that 2 marks will be given for a correct answer and 1/2 mark will be deducted for an incorrect answer.

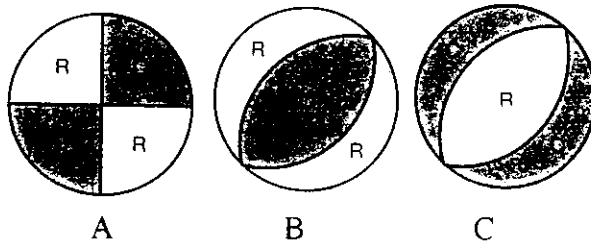
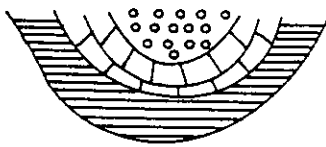


Figure 1

Compression
Extension

1. Figure 1 shows the data from three different seismic events A, B and C. These represent.
- A = a N-S dextral fault, B = a compressional fault and C = an extensional fault.
 - A = an E-W sinistral fault, B = an extensional fault and C = a compressional fault.
 - A = a N-S sinistral fault, B = a compressional fault and C = an extensional fault.
 - A = either a N-S dextral fault or an E-W sinistral fault, B = an extensional fault, C = a compressional fault
 - A = either a N-S sinistral fault or an E-W dextral fault, B = a compressional fault and C = an extensional fault.



- Permian conglomerate
- Triassic limestone
- Jurassic Shale

2. Figure 2 represents a:
- Synformal syncline
 - Synformal anticline
 - Antiformal anticline
 - Antiformal syncline
 - None of the above

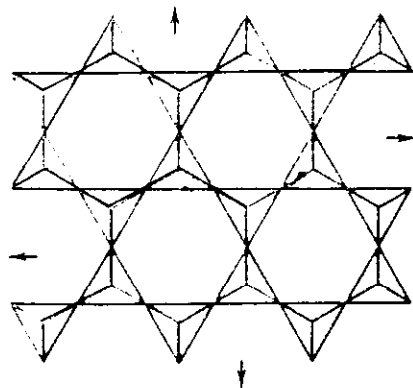


Figure 3.

Name.....

3. Figure 3 shows the structure of one of the silicate mineral groups. This group is represented by:

- a. Feldspars
- b. Micas
- c. Clays
- d. Feldspars + Micas
- e. Micas + Clays

4. The Plagioclase feldspar group of minerals includes two end members these are:

- a. KAlSi_3O_8 and $\text{NaAlSi}_3\text{O}_8$
- b. KAlSi_3O_8 and $\text{CaAl}_2\text{Si}_2\text{O}_8$
- c. $\text{NaAlSi}_3\text{O}_8$ and $\text{CaAl}_2\text{Si}_2\text{O}_8$
- d. $(\text{Mg, Fe})_2\text{SiO}_4$ and $\text{NaAlSi}_3\text{O}_8$
- e. $(\text{Mg, Fe})_2\text{SiO}_4$ and $\text{Ca}(\text{Mg, Fe, Al})[(\text{Si, Al})\text{O}_3]_2$

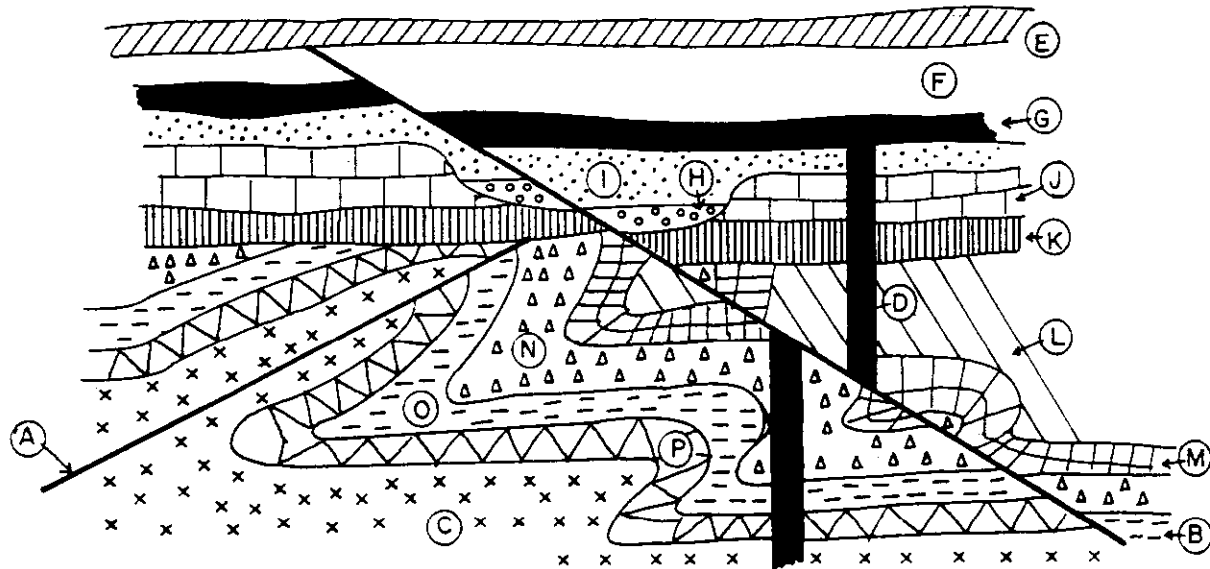


Figure 4

Figure 4 is a cross-section through the outer layers of the upper crust showing the disposition of the various strata relative to one another. Use the information from the diagram to answer questions 5-8.

5. There are two interconnected basalt units in the stratigraphic sequence shown in figure 4. These are D and G. Which of the following statements is true.

- a. D is definitely a dyke and G is definitely a sill.
- b. D is a dyke and G is a sill because unit I shows evidence of contact metamorphism.
- c. D is a dyke and G is a lava flow because unit I shows evidence of contact metamorphism
- d. D could be either a dyke or a volcanic plug and G is a lava flow because unit I shows evidence of contact metamorphism.
- e. D could be either a dyke or a volcanic plug and G could be either a lava flow or a sill because unit I shows evidence of contact metamorphism.

Name.....

6. The strata in figure 4 shows which of the following stratigraphic relationships (not including faulting).
- The beds were laid down in a continuous sequence with no break in deposition at any time.
 - The history of the area is complex. A nonconformity can be identified in the upper sequences.
 - The history of the area is complex. A disconformity can be identified within the sequence.
 - The history of the area is complex. An angular unconformity can be identified with the sequence.
 - The history of the area is complex. A nonconformity, a disconformity and an angular unconformity can all be identified within the sequence.
7. The two faults shown in figure 4 are
- Both extensional
 - Both compressional
 - Both strike-slip
 - A is strike-slip and B is compressional
 - A is compressional and B is extensional.
8. The sequence of events depicted in the stratigraphic sequence shown in figure 4 are:
- C, P, O, N, M, L, A, K, J, H, I, F, D, G, B, E
 - C, P, O, N, M, L, A, K, J, H, I, D, G, F, B, E
 - C, P, O, N, M, A, L, K, J, H, I, F, D, G, B, E
 - Either A or B could be correct.
 - Either B or C could be correct.

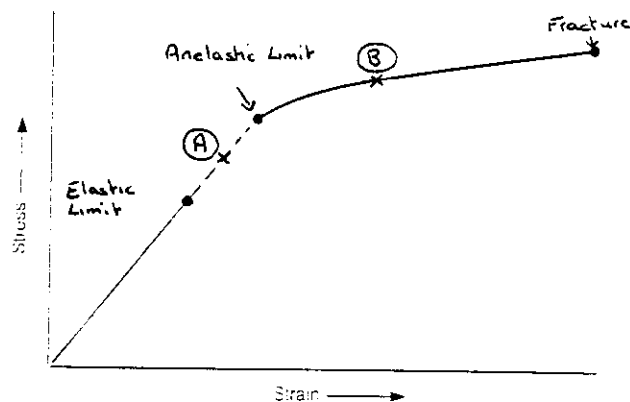


Figure 5 - Stress strain curve.

9. Two rocks A and B have been subjected to different amounts of stress resulting in different amounts of strain. The data collected has been plotted on the stress-strain curve in figure 5. What will happen in each case once the stress is removed.
- Nothing
 - Both materials will behave elastically and return to their original shapes.
 - A will immediately return to its original shape and will show no record of the deformation. B will be permanently deformed.
 - A will return to its original shape with time and will show no record of the deformation. B will be permanently deformed.
 - A will return to its original shape with time and will show no record of the deformation. B will undergo a period of anelastic and elastic recovery but will never recover its original shape.

Name.....

10) If rock B were subjected to the same amount of stress, but under conditions of low temperature, low confining pressures and high strain rates the outcome would most likely be:

- a. Elastic deformation - B would regain its original shape
- b. Anelastic deformation - B would regain its original shape with time
- c. Ductile deformation - B would be permanently deformed.
- d. Brittle deformation - B would undergo rupture
- e. All of the above - B would undergo a period of recovery once the stress had been removed but it would show evidence of permanent ductile and brittle deformation.

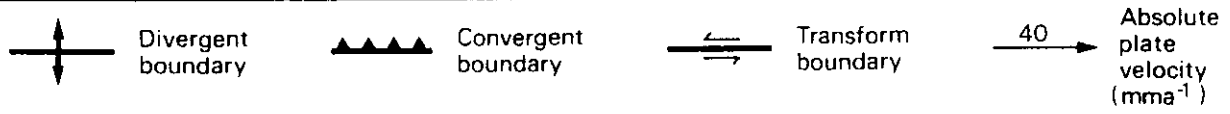
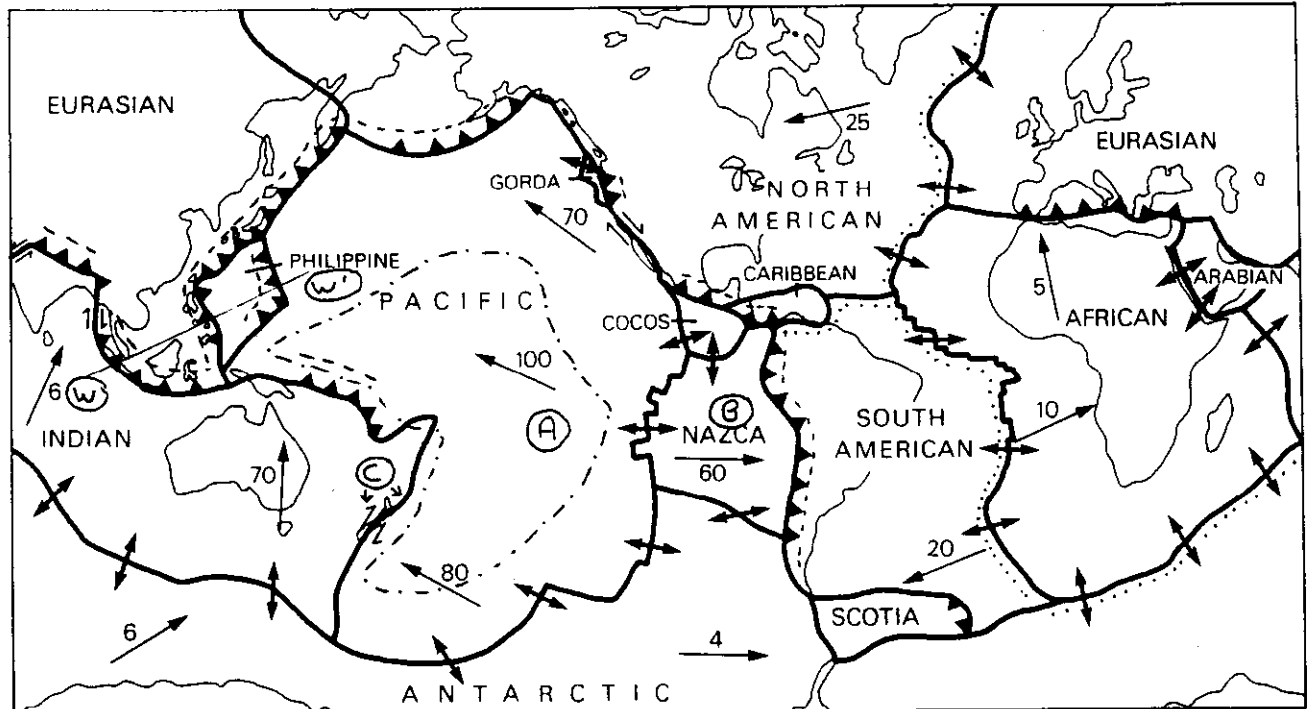
11. The seismic discontinuity at the mesosphere, outer core boundary is known as:

- a. Mohorovic
- b. Conrad
- c. Gutenberg
- d. 920 km
- e. 430 km

12. Continental rifts may be

- a. A precursor to an ocean
- b. A result of passive rifting
- c. A result of active rifting
- d. A result of continental collision
- e. All of the above.

Figure 6 shows the spatial distribution of the main lithospheric plates.



..... Line 1
----- Line 2
- - - - - Line 3
4

Name.....

13. Location A and location B in figure 6 are situated on two different plates. In the next 3 million years these two localities will:

- a. Move further apart
- b. Move closer together
- c. Remain the same distance from one another as they are today
- d. Show only dextral movement relative to one another
- e. Show only sinistral movement relative to one another

14. The plate boundary shown at locality C in figure 6 is:

- a. Similar to that in southern America
- b. Similar to that at the Mid-Atlantic ridge
- c. Similar to the San Andreas
- d. Similar to the Dead Sea Fault System
- e. None of the above.

15. Which of the lines marked on the map 1, 2, and 3 represents the andesite line.

- a. 1
- b. 2
- c. 3
- d. All of the above.
- e. None of the above.

16. The ultimate fate of Australia is:

- a. To move further away from Antarctica
- b. To move north relative to the Southern Pacific
- c. To collide with the Philippines and Eurasia
- d. All of the above
- e. None of the above.

17. The line of section W- W' cross-cuts several plate boundaries that lie between the Indian, Eurasian and Pacific plates. Which of the following statements is true.

- a. The present situation is stable and will continue
- b. The present situation is unstable boundary X and Y must grow further apart with time as this part of Eurasia grows in size
- c. The present situation is unstable boundary Y will ultimately cease.
- d. Both B and C are correct
- e. None of the above

18. In which of the following environments is the law of superposition questionable?

- a. Neutral folds
- b. Accretionary prisms
- c. Deltas
- d. A, B and C are true
- e. B and C are true

19. Which of the following statements about ridge-ridge-ridge triple junctions is correct ?

- a. They represent stable plate boundary configurations
- b. They represent unstable plate boundary configurations
- c. They are precursors to the formation of aulacogens
- d. Both A and C are correct
- e. Both B and C are correct.

Name.....

20. Mount Lebanon is an example of
- a. A continental margin orogen
 - b. An intercontinental collision orogen
 - c. A structure formed on the releasing bend of a continental transform
 - d. A structure formed on the restraining bend of a continental transform
 - e. A Precambrian craton.

Name.....

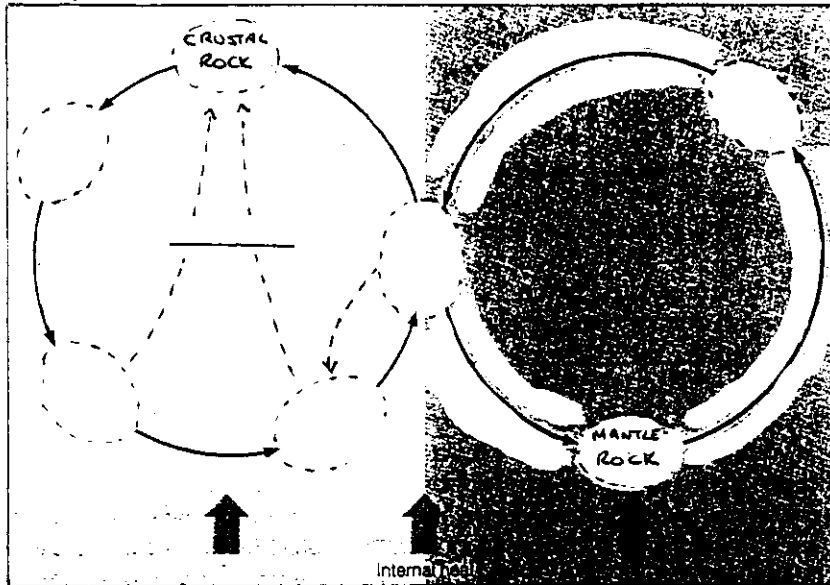
Q. No.	A	B	C	D	E
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2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
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15	A	B	C	D	E
16	A	B	C	D	E
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19	A	B	C	D	E
20	A	B	C	D	E

Name.....

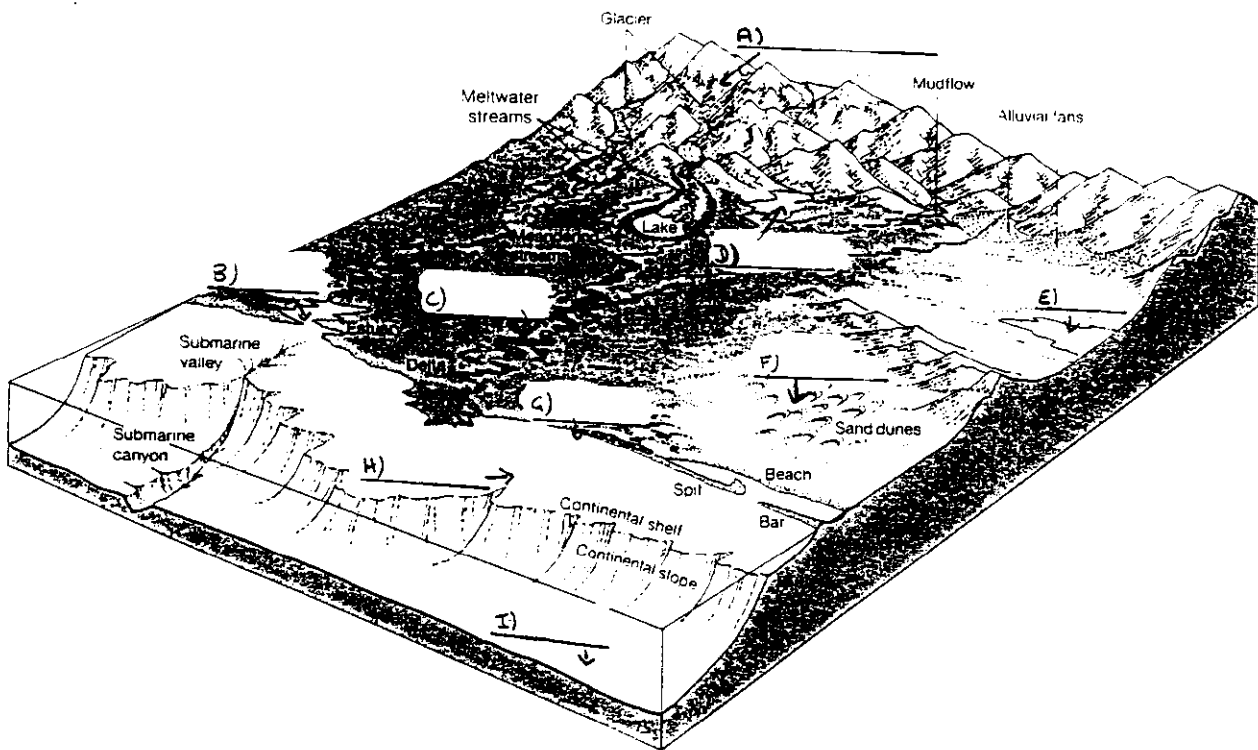
Section B. (15 marks)

Complete the following diagrams/tables and where possible give examples.

1. The rock cycle (4 marks)

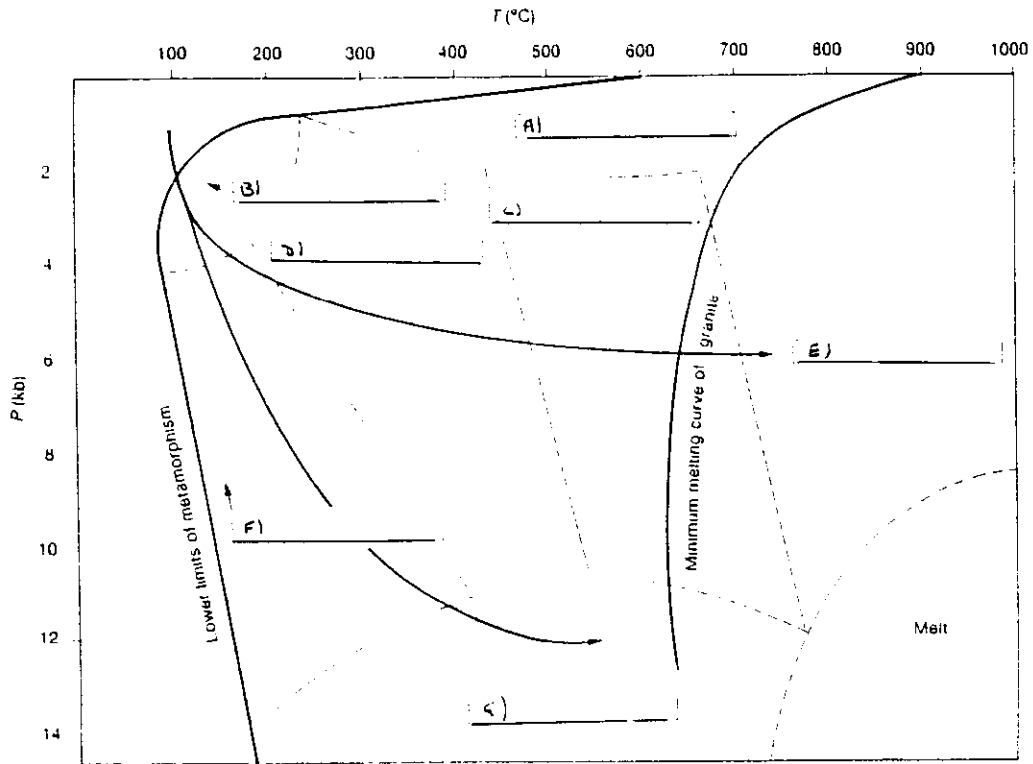


2. Sedimentary facies (4.5 marks)



Name.....

3. Metamorphism facies (3.5 marks)



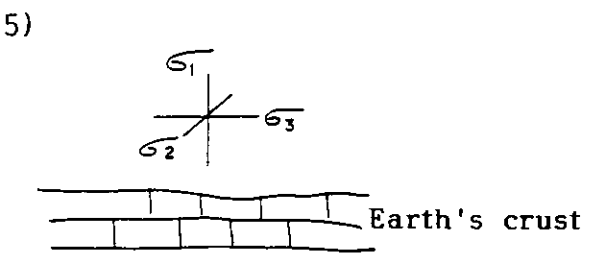
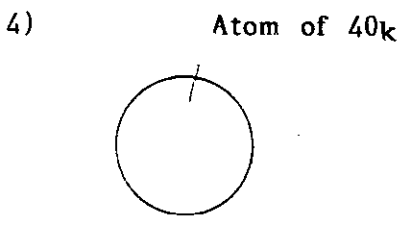
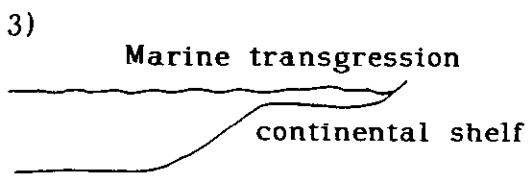
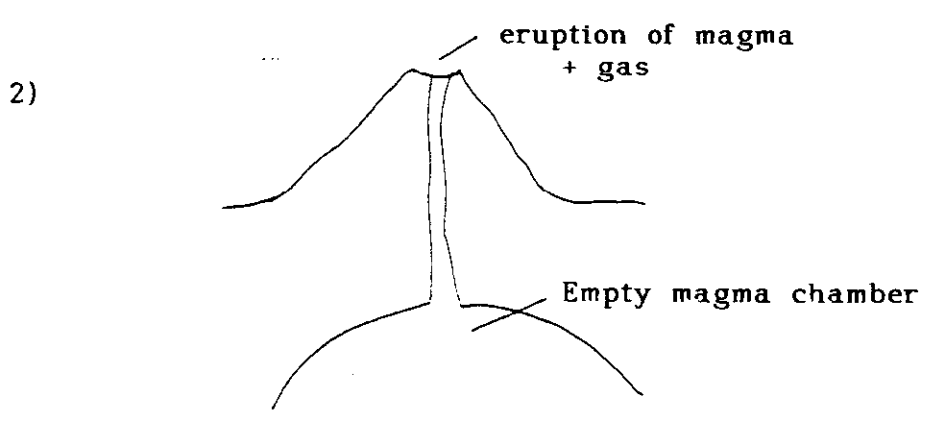
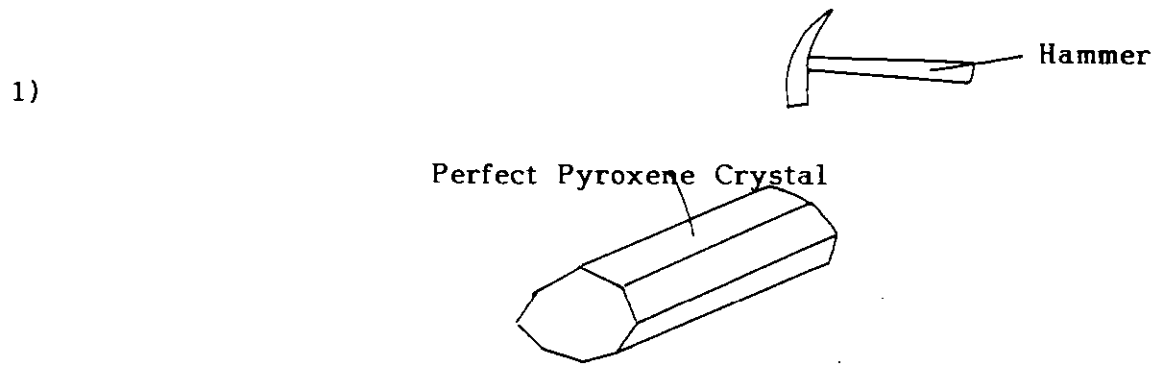
4. Geological column (3 marks)

	Era	Period
Phanerozoic	Cenozoic	
	Mesozoic	
	Paleozoic	
Precambrian	Proterozoic	Late
		Middle
		Early
	Archean	

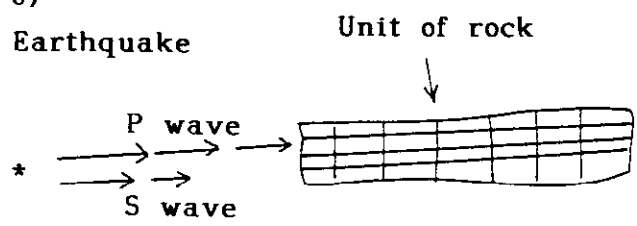
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Section D (20 marks)

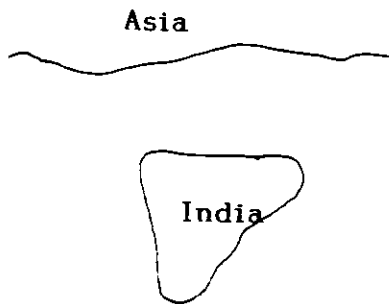
Each of the following sketches represents a moment in time. Using diagrams explain what important event(s) would happen next in each case.



6)
Earthquake



7)



8)

