The diagram below represents a cutting in to the earth revealing the layers of rock. Some of these layers may have been laid down by water (sedimentary rocks) or by volcanic activity (volcanic rocks). Fossils are the actual remains or impressions of plants, animals, or other organisms that become trapped in the layers after their death. Layers of sedimentary rock are arranged in the order that they were deposited, with the most recent closest to the surface (unless they have been disturbed).

1. Discuss the importance of fossils as a record of evolutionary change over time.
The questions below relate to the diagram above, showing a hypothetical rock profile from two locations separated by a distance of 67 km. There are some differences between the rock layers at the two locations. Apart from layers D and L which are volcanic ash deposits, all other layers are comprised of sedimentary rock.

2. Assuming there has been no geological activity (e.g. tilting or folding), state in which rock layer (A-O) you would find:
   a. the youngest rocks at Location 1
   b. the oldest rocks at Location 1
   c. the youngest rocks at Location 2
   d. the oldest rocks at Location 2

3. State which layer at location 1 is of the same age as layer M at location 2
   Explain your reasoning

4. The rocks in layer H and O are sedimentary rocks. Explain why there are no visible fossils in those layers.

5. State which layers present at location 1 are missing at location 2.
   State which layers present at location 2 are missing at location 1.

6. Using radiometric dating, the trilobite fossil was determined to be approximately 375 million years old. The volcanic rock layer D was dated at 270 million years old, while rock layer B was dated at 80 million years old. Give the approximate age range (i.e. greater than, less than, or between given dates) of the rock layers listed below:
   a. Layer A
   b. Layer C
   c. Layer E
   d. Layer G
   e. Layer L
   f. Layer O

7. The type of dating you performed in question 6 is called ___________________ dating. Explain how it is different from absolute dating.

8. Give two elements (isotopes) that can be used for absolute dating. ___________ & ___________

9. Which one can be used on the remains of living organisms? ________________