

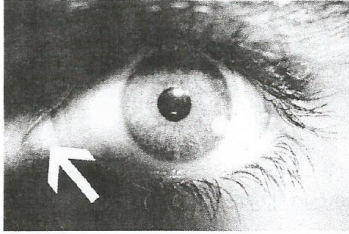
1. (4 marks) For each statement, give the name of the philosopher, naturalist or scientist associated with the concept. Write the name on the line following the statement. Only one name can be written per statement, and a name can be mentioned more than once. Choose amongst the names written below:

~~Aristotle~~, Calvin Klein, ~~Charles Darwin~~, Jean -Baptiste Lamarck, ~~Cuvier~~, Marie Curie, Alfred Einstein, Socrates, Buffon, ~~Democritus~~, Malthus, Michael Jackson, Miley Cyrus, ~~Anaximander~~, ~~Carl Von Linneaus~~, Isaac Newton, Plato, ~~William Paley~~, Empedocles, August Weismann, Nemo, Justin Trudeau, It (the clown), Madonna. (0.5 marks for each correct question).

- a. I am the father of the Theology of Nature and I believe that harmony in nature is the proof of the existence of God. William Paley 0.5
- b. I have elaborated the binomial system of nomenclature Carl Von Linnaeus 0.5
- c. I believe that there are two realities in the universe: atoms and emptiness.
Democritus 0.5
- d. I am the first one to believe that you can find the essence of all living things by looking and observing nature. Aristotle 0.5
- e. I invented the concept of the great chain of beings
Aristotle 0.5
- f. I have developed the concept of "catastrophism" Cuvier 0.5
- g. I am the first one to propose that variability within a species is an important component of our understanding of evolutionary change.
Charles Darwin 0.5
- h. I believe that water is the main and central element of the universe and of life
Anaximander 0.5

4

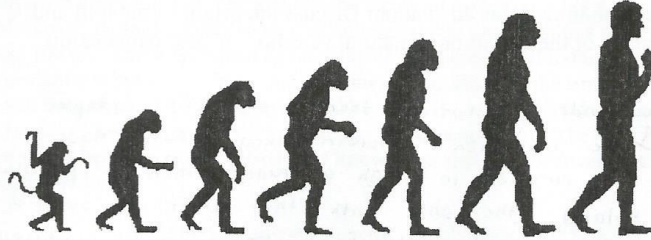
2. (3 marks) Why is this small structure in the corner of our eye a proof of evolution? Your response should include a brief explanation of the function of this structure in other vertebrates.



The small structure in the corner of our eye is a remnant of a third eyelid. A third eyelid is transparent and is used for protection for vision during activities like swimming, our flying and also during strong weather of snowstorm, sandstorm, and the like. Third eyelids prevent harmful particles from coming in our eye area and helps organisms to see clearly despite drastic conditions. A fully functioning third eyelid was present in our ancestors thousands or millions of years ago. They used this eyelid for survival. Evolution takes a long time to process change within a population, and that is why we, humans, still have a remnant of it. It is now a vestigial feature meaning it is present in our anatomy but does not have its initial function. It serves as a proof that we evolved from organisms who had this fully functioning eyelid back then.

No text beyond this line

3. (3 marks) a) Give three reasons why the following image misrepresents human evolution?



1. Chimpanzees did not transform into humans. Speciation occurred or else there would only be one specie living today. ✓ 0.5
2. Evolution did not happen linearly. There has to be branching because we vary in different traits. ✓ 0.5
3. There were many species of humans (like 5-6) living at the same time. The human specie today did not just come out just like that.

- b) (2 marks) Name the scientists to whom we attribute the principle of uniformity (or uniformitarianism) (0.5 marks). Explain this principle in a maximum of two or three sentences. (1.5 marks)

Hutton and Lyell - UNIFORMITARIANISM ✓ 0.5

According to these scientists, evolution is more logical with geology. It is a slow, long, and gradual process. Also, the laws of nature does not affect time. ✓ 0.8

Do not write beyond this line

4. (5 marks) Humans have been living in the Andes for 11,000 years. The capacity of human populations to live in high altitude in the Andes is a good example of natural selection. Explain the evolution of this adaptation. Discuss the origin of the trait and include the main elements of the definition of natural selection in your explanation.

In the lowlands population, there were some people who had 1 the mutation wherein they would have capability to survive in high altitudes. When a population migrated upland, the ones with the trait to survive in high altitude will most 1 lived longer and produced more offspring 1 than those who do not have the trait.

- ② The offspring 1 would inherit the trait and it is favoured because they need it to survive by adapting to the environment. ^(natural selection) In uplands, the partial pressure is higher and the body produces more RBC 1 to maintain saturation of oxygen. Now, these offspring will reproduce as they grow up and the population with the inherited 1 traits will increase. Mutation is random so not all of the people in the first population from lowlands will have the ability to thrive in uplands. Therefore, members of a population vary in different traits.

Do not write beyond this line

5. (5 marks) During a family meal, one of your uncles reacts when he learns that you are taking a course on evolution. He tells you that he does not believe in the evolution of life on Earth. He says that Darwin was wrong and that the theory of evolution is not a concept that reflects reality. Moreover, he said, scientists are challenging several aspects of this theory. Your uncle believes that life on Earth was created by God and he (she) created all living species. Moreover, God is constantly watching us. Your uncle claims that his vision is the simplest one and that it is the truth because no one can prove that God does not exist. As a good scientist, you object to his arguments and you decide to integrate in your **argumentation the four clauses of the implicit contract between the acquisition of knowledge and the advancement of science**. Present your argument here.

Everything comes from something. There is always a source in which everything started. It is possible that God created us but what are we made up of? We were born and raised in specific environments and that builds our perception of the world but we should see the world for whatever value it has. Mixing reality with ideas is not the way to go. If no one can prove that God does not exist, how can you prove that He does? In coherent steps, how can you conclude that He is definitely here? Charles Darwin's theory of evolution and natural selection is materialistic. He made observations, studied and tested it. It is not random and he proved it. Also, you will be able to see it throughout history and nature itself. Charles Darwin showed that his theory is verifiable in the real world and that is a close to the truth that we can get to proving the theory of evolution.

Do not write beyond this line
End of the exam!