**Written assignment: short answer questions (20% of the module)**

**Guidelines:**

* You should use around 100-150 words to answer each question.
* No reference list needed. But you should use **your own words** to answer each question. Please click the following link on advice about how to avoid plagiarism: <https://www.uwl.ac.uk/current-students/support-current-students/academic-support/advice-students-plagiarism>
* Submit the assignment online **as a Word document** through Turnitin.
* **Deadline for submission: 13th Jan 2023 at 11:59pm**

**Questions (Please answer ALL of the following questions. Each question carries 10 marks):**

1. Scientists have argued for many years that skin cancer was an evolutionary driver that enforced the predominance of dark-skin individuals in areas with high levels of sun exposure. Dark skin does reduce the chance of getting skin cancer, but studies have shown that skin cancer often occurs after individuals are 45 years old. Given the information provided above, could skin cancer explain the high selective pressure for dark skin in areas with high doses of sun exposure? Briefly explain.
2. Please explain how the passage of genes from parents to offspring, in the form of particular alleles, ensures perpetuation of parent traits in offspring and, at the same time, genetic variation among offspring. Use genetic terms in your explanation.
3. For many generations, humans have been selecting animals with specific features (e.g. a fast running horse). How could this procedure affect evolution through natural selection? Provide an example of beneficial or detrimental consequences that this procedure could have in a particular species.
4. “Natural selection is the survival of the fittest” is a statement often expressed by people with an imperfect understanding of natural selection. Please discuss why this statement may be misleading.
5. “Natural selection is always the most powerful mechanism of evolution, and it is the primary agent of evolutionary change.” Is this statement correct? Explain.
6. In week 8’s video #2 “African Genomics: Human Evolution”, Dr Sarah Tishkoff stated that “African has the most genetic diversity in the world”. Please explain the possible reasons for this using non-adaptive mechanisms of evolution, such as genetic drift, founder's effect, and gene flow.
7. *Peromyscus polionotus* is a species of oldfield mice that recently (6,000-10,000 years before present) invaded the islands off of the coast of northwestern Florida. Mice that live on the mainland are dark brown, matching the dark, loamy soil, while the subspecies of mice that live on the white sandy beaches have much paler coloration. Briefly explain how the lighter coloration in the subspecies evolved.
8. Scientists can use the principles of evolution to understand certain features of cancer cells. Provide an example of how the evolution of cancer cells could resemble the evolution of species.
9. Give an example of an adaptive radiation. Provide evidence for the claim that the radiation originated with one or a few species, it was rapid, and the descendant groups occupy a wide array of ecological niches. Briefly explain why the radiation occurred.
10. Explain how genetic information, along with an understanding of the process of descent with modification, enables scientists to reconstruct phylogenies that extend hundreds of millions of years back in time.