PAPER 2: FOUNDATIONS OF BIOLOGY: ESSAY PAPER

COLLECTION TRINITY TERM 2020

Answer FOUR questions, including at least ONE question from EACH section.

Start each question in a NEW answer book.

Please write YOUR CANDIDATE NUMBER and QUESTION NUMBER on each answer book.

Use of calculators is permitted

Do not turn over until told that you may do so.
Section A: Building a Phenotype

1. Discuss the supporting evidence for the RNA world hypothesis.
2. Describe how gene expression is regulated in eukaryotes and why such regulation is necessary.
3. Using specific examples, describe three key signalling pathways in multicellular organisms.
4. “Life is nothing but an electron looking for a place to rest.” Write an essay that explains this quote by the Nobel Laureate, Albert Szent-Györgyi.

Section B: Diversity of Life

5. How do bacteria interact with other organisms?
6. By what measures might angiosperms be considered a successful clade?
7. Are phylogenetic trees a useful way of describing the diversity of life?
8. What are the distinguishing features of arthropods and why have they been so successful?

Section C: Evolution & Ecology

9. What are the benefits of cooperation? Explain how these benefits have led to major transitions in evolution.
10. With reference to simple models, explain how interactions with other species affect population dynamics.
11. How can Darwin’s theory of evolution by natural selection be tested?
12. What drives evolutionary innovation?