



# UNIVERSITY OF NAIROBI

UNIVERSITY EXAMINATIONS 2017/2018

THIRD YEAR EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE

SZ1 301: EVOLUTIONARY BIOLOGY

DATE: FEBRUARY 27, 2018

TIME: 9.00 A.M. - 11.00 A.M.

**INSTRUCTIONS:**

Answer any TEN questions.

1. (a) Explain why anagenesis is not a plausible pattern for evolution. (4 marks)  
(b) Show why convergent evolution is inevitable in nature. (3 marks)
2. (a) Discuss the likelihood of the human species diverging into separate species in the future. (3 marks)  
(b) Describe why and how human lost their tail. (4 marks)
3. Explain why the Hardy-Weinberg equilibrium has not worked throughout the course of evolution. (7 marks)
4. Explain the following terminologies:  
(a) Gene frequency (3 marks)  
(b) Mutation pressure (2 marks)  
(c) Palaeogenes and neogenes (2 marks)
5. Variation is ground zero for evolution. Explain this statement and how this variation is generated. (7 marks)
6. (a) Describe the morphological features among vertebrates that point to a shared ancestry. (4 marks)  
(b) Distinguish between gene flow and genetic drift. (3 marks)

7. Explain the effect of the following on the evolutionary process:

(a) Migration

(b) Sexual selection

(c) Founder effect

(3 marks)

(2 marks)

(2 marks)

(7 marks)

8. Briefly describe the theories of the origin of life.

9. (a) Discuss the significance of heterozygosity as a fitness attribute in the evolutionary process. (3 marks)

(b) Describe the laws of science that were not accounted for in Darwin's "Origin of Species". (4 marks)

(7 marks)

10. Discuss animal evolution in the Mesozoic era.

11. (a) Discuss the causes and effects of sympatric speciation.

(4 marks)

(b) Distinguish between parapatric and peripatric speciation.

(3 marks)

12. Describe the key observations that Charles Darwin made that form the basis of his theory of natural selection. (7 marks)

13. Discuss the mechanisms of speciation.

(7 marks)

14. Explain why a small population of an asexual organism cannot conform to the Hardy-Weinberg equilibrium. (7 marks)

15. Using evolutionary perspective, discuss the need for diversity during gametogenesis.

(7 marks)