

Form 4 Biology Paper 1 Examination

Subject: Biology | Class: Form 4

Duration: 120 minutes | Total Marks: 100

INSTRUCTIONS:

- Answer ALL questions.
- Write neatly and clearly.
- Show all working where necessary.

SECTION A: Multiple Choice Questions

1. State two functions of the mammalian skin.
2. Differentiate between magnification and resolution in microscopy.
3. Name the organelle that is responsible for the modification and packaging of proteins in a cell.
4. Give two reasons why a plant cell placed in a hypertonic solution becomes flaccid.
5. State three characteristics of the kingdom Animalia.
6. Name the class of arthropods that has two pairs of antennae.
7. Define the term 'ecosystem'.
8. State two ways in which nitrogen is lost from the soil.
9. Name the type of respiration that occurs in yeast cells in the absence of oxygen.
10. State two roles of light in the process of photosynthesis.
11. Give two differences between aerobic and anaerobic respiration.
12. Name the hormone that stimulates the secretion of gastric juice.
13. State two functions of the liver.
14. What is the role of the loop of Henle in the kidney?
15. Name the part of the human ear that is responsible for balance.
16. State two functions of the female placenta.
17. Differentiate between homozygous and heterozygous genotypes.
18. In a certain plant species, the allele for red flowers (R) is dominant over that for white flowers (r). If a heterozygous red-flowered plant is crossed with a white-flowered plant, what is the probability of obtaining white-flowered offspring?
19. Name one example of a sex-linked disorder in humans.
20. State two pieces of evidence that support the theory of evolution.

SECTION B: Structured Questions

21. a) Describe how the mammalian kidney regulates water balance in the body. (8 marks)
b) Explain the role of the hypothalamus in thermoregulation. (7 marks)
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- b) Explain the role of the hypothalamus in thermoregulation. (7 marks)

[15 marks]

22. a) Describe the process of DNA replication. (8 marks)
b) State three differences between DNA and RNA. (3 marks)
c) Explain the role of mRNA in protein synthesis. (4 marks)
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- b) State three differences between DNA and RNA. (3 marks)
- c) Explain the role of mRNA in protein synthesis. (4 marks)

[15 marks]

23. a) Describe the process of photosynthesis in higher plants. (8 marks)
b) Explain how limiting factors affect the rate of photosynthesis. (7 marks)
- a) Describe the process of photosynthesis in higher plants. (8 marks)
- b) Explain how limiting factors affect the rate of photosynthesis. (7 marks)

[15 marks]

24. a) Describe the structure and function of the mammalian heart. (8 marks)
b) Explain the process of blood clotting. (7 marks)
- a) Describe the structure and function of the mammalian heart. (8 marks)
- b) Explain the process of blood clotting. (7 marks)

[15 marks]

25. a) Describe the process of succession in a freshwater ecosystem. (8 marks)
b) Explain the role of decomposers in the carbon cycle. (7 marks)
- a) Describe the process of succession in a freshwater ecosystem. (8 marks)
- b) Explain the role of decomposers in the carbon cycle. (7 marks)

[15 marks]

26. a) Describe the structure of a neurone and explain how a nerve impulse is transmitted across a synapse. (8 marks)
b) State three effects of drugs on the nervous system. (3 marks)
c) Explain the role of the spinal cord in reflex action. (4 marks)
- a) Describe the structure of a neurone and explain how a nerve impulse is transmitted across a synapse. (8 marks)
- b) State three effects of drugs on the nervous system. (3 marks)
- c) Explain the role of the spinal cord in reflex action. (4 marks)

[15 marks]

27. a) Describe the process of gametogenesis in humans. (8 marks)
b) Explain how the menstrual cycle is regulated by hormones. (7 marks)
- a) Describe the process of gametogenesis in humans. (8 marks)
- b) Explain how the menstrual cycle is regulated by hormones. (7 marks)

[15 marks]

28. a) Describe the different types of adaptations that enable animals to survive in their habitats. (8 marks)
b) Explain the concept of natural selection and how it leads to evolution. (7 marks)
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- b) Explain the concept of natural selection and how it leads to evolution. (7 marks)

[15 marks]