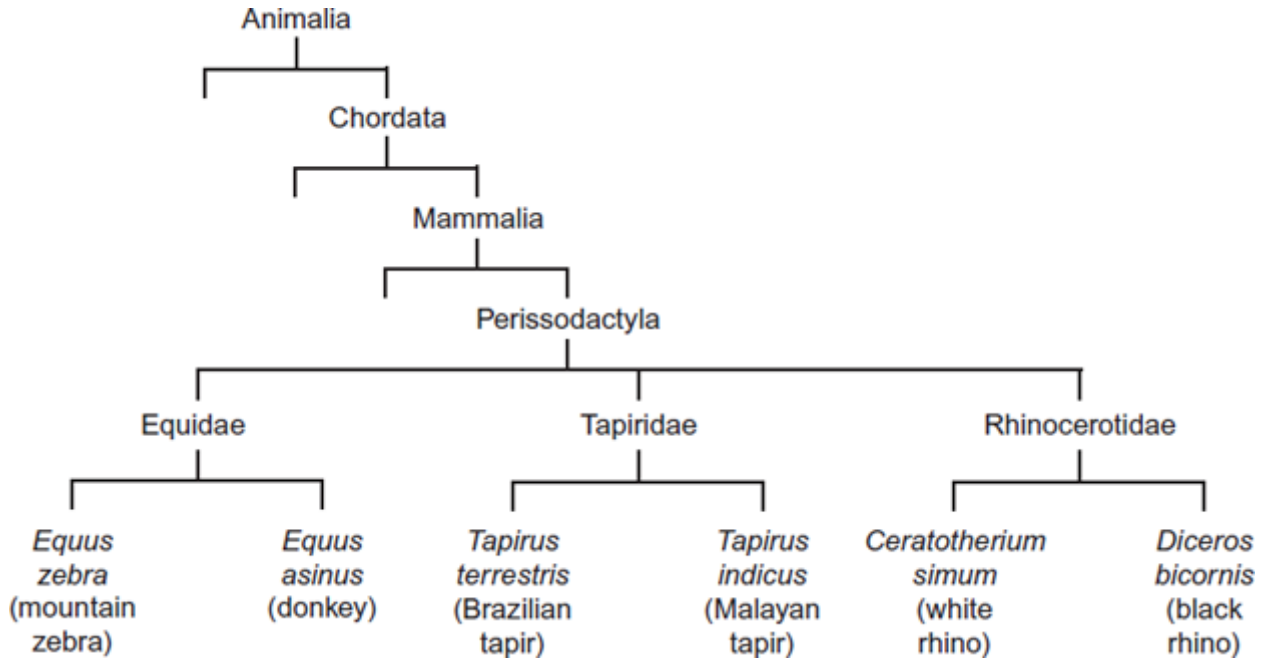
Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

The following figure shows how some animals with hooves are classified.



(a) This type of classification can be described as a phylogenetic hierarchy.

(i) What is meant by a **hierarchy**?

_____

_____

_____

_____

(2)

(ii) How many different families are shown in the figure?

☐

(1)

(iii) To which phylum does the white rhino belong?

_____

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(1)

(b) (i) Explain the role of independent segregation in meiosis.

_____

_____

_____

_____

(2)

(ii) A zedonk is the offspring produced from breeding a mountain zebra with a donkey.

- The body cells of a mountain zebra contain 32 chromosomes.
- The body cells of a donkey contain 62 chromosomes.

Use this information to suggest why zedonks are usually infertile.

_____

_____

_____

_____

(2)

(Total 8 marks)

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Q2.

(a) What **two** measurements are needed to calculate an index of diversity?

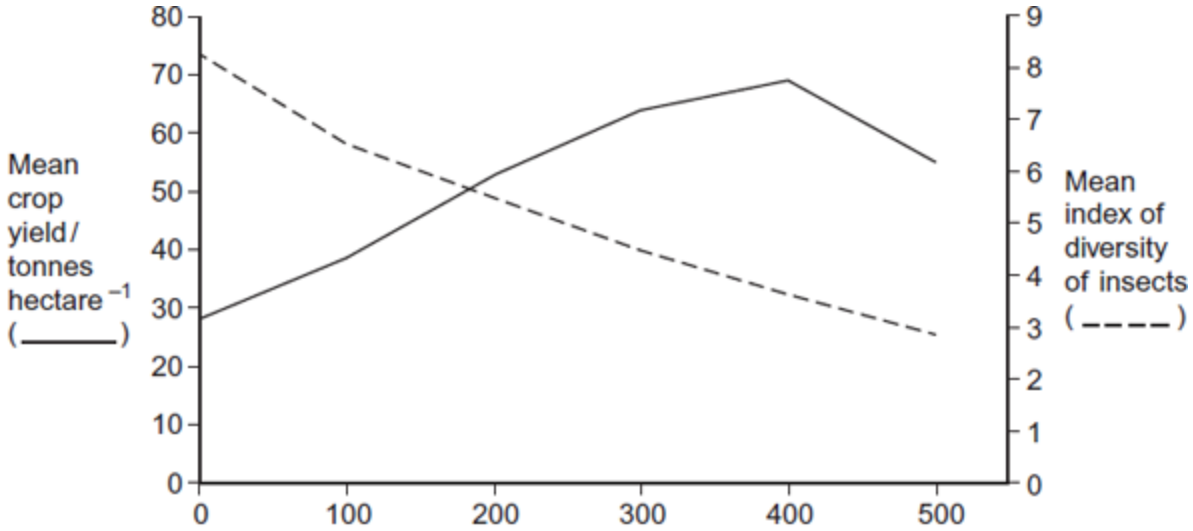
1. _____

2. _____

(2)

(b) A herbicide is a chemical used to kill weeds. Ecologists investigated the effect of a herbicide on crop yield and the diversity of insects. They sprayed different fields with the same volume of different concentrations of the herbicide. At harvest, the ecologists determined the mean crop yield and the mean index of diversity of insects for fields that had received the same concentration of the herbicide.

The figure below shows their results.



(i) Some fields acted as controls. They were sprayed with a solution that did not contain the herbicide. Explain the purpose of these control fields.

_____

_____

_____

(1)

(ii) Suggest an explanation for the relationship between the concentration of herbicide and the mean crop yield.

_____

_____

_____

_____

(2)

(iii) Explain the relationship between the concentration of herbicide and the mean index of diversity of insects.

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(3)

(Total 8 marks)

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Q3.

During the light-independent reaction of photosynthesis, carbon dioxide is converted into organic substances. Describe how.

(Total 6 marks)

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