

PRELIM REVISION

04 SEPTEMBER 2013

Lesson Description

In this lesson we:

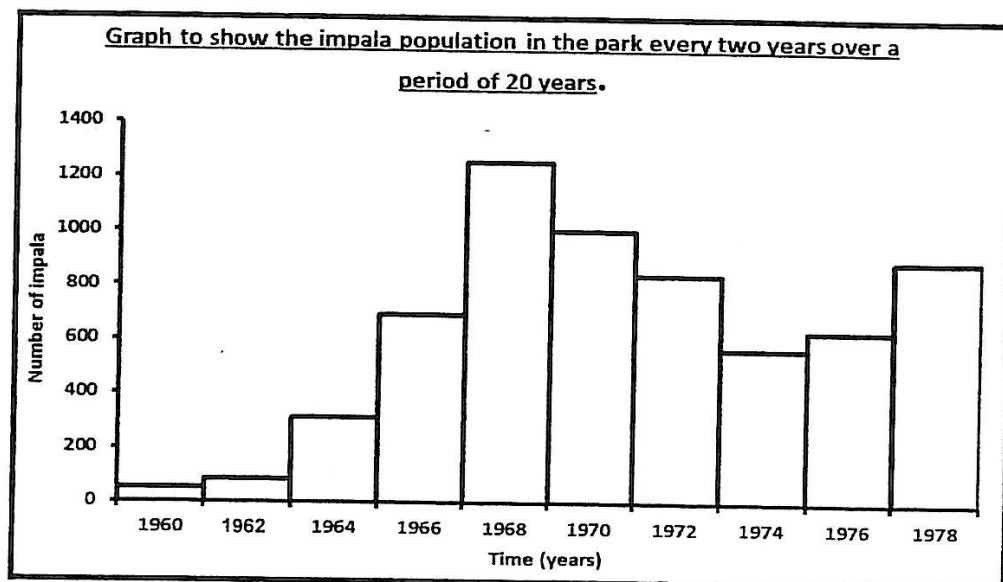
- Prepare for the Prelim Exams by looking at various exam type questions.

Questions

Question 1

(Adapted from Limpopo, P2, 2012 Prep, Question 2.3)

An investigation was carried out to investigate the growth of an impala population in a park. An area of grass and shrub land was fenced off and 50 impala buck (25 male and 25 female) were introduced. The park contained no other buck or predators. The number of buck present in the park was counted every two years, in July. The graph below shows the impala population each July over a 20 year period.



- Give TWO reasons why the growth rate from 1960 to 1962 is slow. (2)
- Name TWO density dependent factors that may have contributed to the decrease in the population from 1968 to 1974. (2)
- How many impala were there in the park in 1970? (1)
- During which year were predators released into the park? (1)
 - Give an explanation to your answer in question d.) i. (2)

[8]

Question 2

(Adapted from Limpopo, P2, 2012 Prep, Question 2.4)

A gardener wanted to know the number of weeds in his vegetable garden which is 10 m wide and 3 m long. He took a number of quadrat samples which were 1 m². The numbers in the quadrats represent the number of weeds occurring there.

15		7			20				
				11			5		
	10								16

Quadrats in the vegetable garden

- a.) i. Were the samples taken at random? (1)
 ii. Give a reason for your answer in question a.) i. (1)
- b.) Calculate the following ...
- i. The average number of weeds in the samples. (2)
 ii. The size of the weed population in the whole vegetable garden, by using the formula:

$$\text{Average number in sample} \times \frac{\text{habitat size}}{\text{sample size}}$$

(2)
[6]

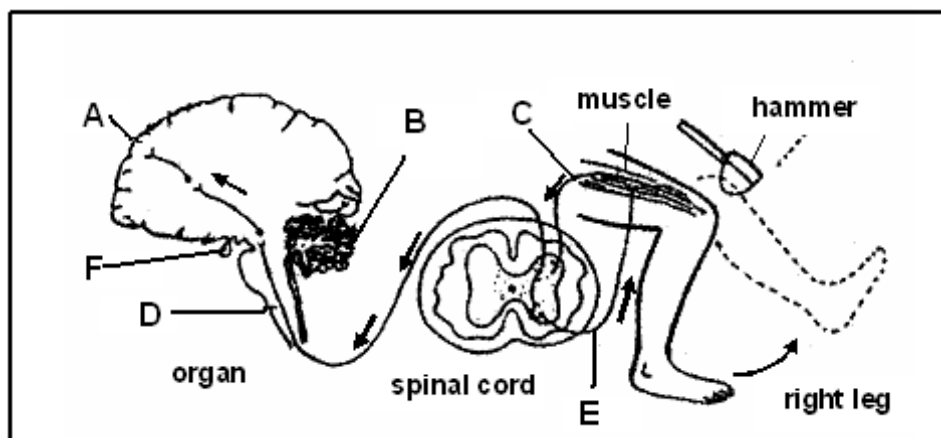
Question 3

Write an essay on:

The interactions between organisms of the same and different species

Question 4

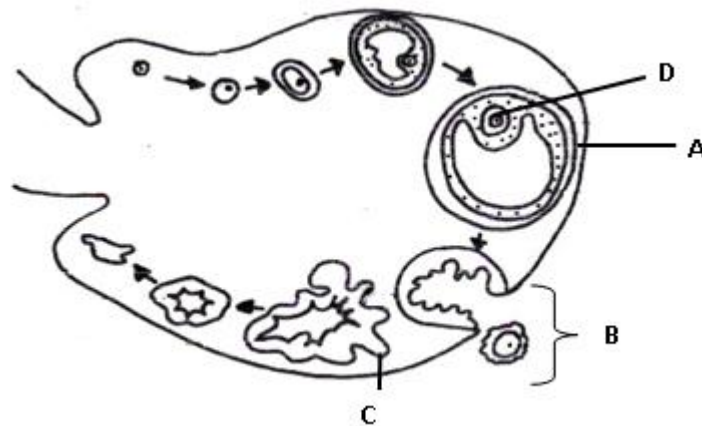
Study the diagram below which shows the human brain (longitudinal section), spinal cord (transverse section) and the right leg.



- a.) Identify the parts labeled A, B, C, D and F (5)
- b.) What will be the effect on the body if part B is damaged? (2)
- c.) Give the LETTER of the part that secretes the hormone TSH (1)
- d.) Give the letter of the part that coordinates the movement of the legs under normal circumstances. (1)
- e.) Draw and label the type of neuron as indicated by E. (7)
- f.) Explain the reflex action shown in the diagram. (5)

Question 5

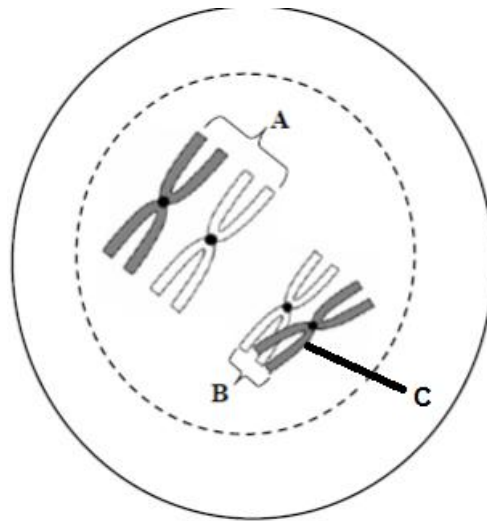
Study the diagram below showing the sequence of events of the development of an ovum in a 28-day cycle.



- a.) Identify the following:
 - i. Follicle labelled A (1)
 - ii. Structure labelled C (1)
 - iii. Process shown at B (1)
 - iv. Hormone responsible for the formation of part A (1)
 - v. Hormone responsible for the formation of part C (1)
- b.) What type of cell division resulted in the formation of part D? (1)
- c.) If the events shown above took place in a 28-day cycle, state whether fertilisation took place during this period. (1)
- d.) Explain your answer to QUESTION c.). (1)
- e.) Explain HOW and WHY the production of FSH is inhibited when fertilisation takes place. (4)

Question 6*(Adapted from IEB 2010)*

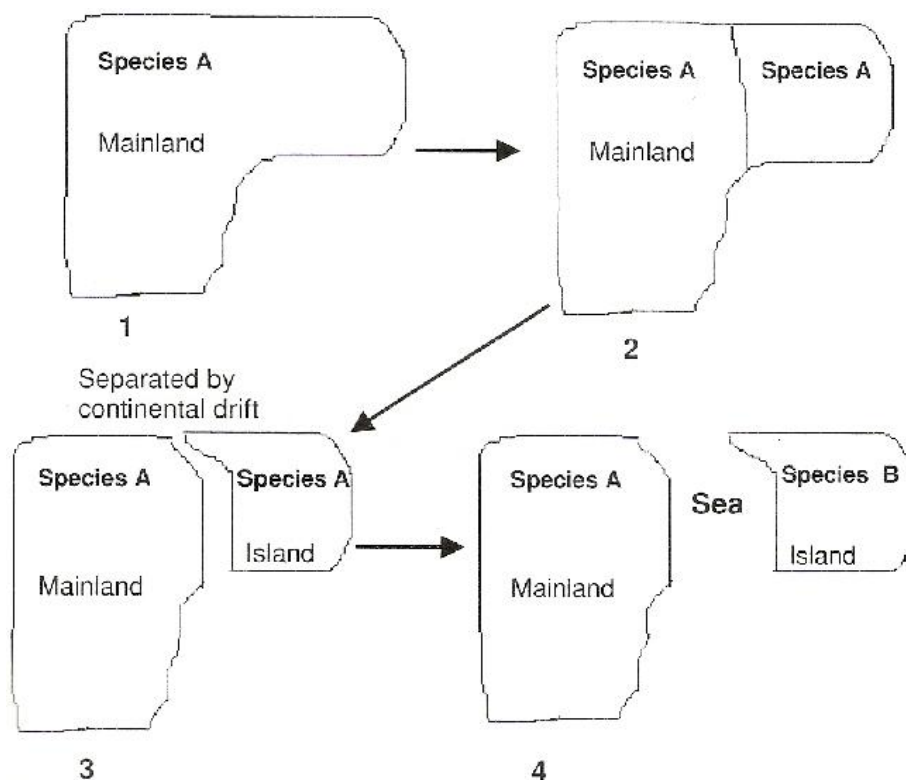
Diagram to show an animal cell during meiosis.



- Would you see the structures A and B as shown in the diagram above, with the naked eye, or with a microscope?
- Name the pair of structures at A and the process taking place at B.
- Explain the significance of the process mentioned in b.)
- Draw structure C to illustrate what it would look like after the process mentioned in b.).

Question 7

Study the following diagrams which show different stages (1 to 4) of a process in evolution.



- a.) Name the evolutionary process that resulted from the continental drift shown.
- b.) Describe how the original population of species A split to become two species as indicated in the diagrams above.

Question 8

Study the diagram of a duck's foot below.



Webbed foot of a duck

Ancestors of ducks did not have webbed feet. In terms of natural selection, explain how the webbed feet could have evolved.

Question 9

Write an essay on the causes and nature of the variation on which natural selection depends.

Question 10

Haemophilia is a sex-linked disease caused by the presence of a recessive allele (X^h). A normal father and heterozygous mother have children.

- a.) Represent a genetic cross to determine the possible genotypes and phenotypes of the children of the parents mentioned above.
- b.) What are the chances of the parents having a child that will be a haemophiliac male?
- c.) Explain why the father is not a carrier for haemophilia.

Question 11

The risks and benefits of using biotechnology have been the subject of considerable debate in recent times. State the following:

- a.) THREE disadvantages of genetic engineering
- b.) THREE advantages of genetic engineering