Total Score

Name.....

School.....

Roll No.....

Republic of Somaliland

Somaliland National Examination Board

Form Four

Biology Examination

June 2009

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 20 printed pages

Count them now. Inform the invigilator if there are any missing

There are three parts:

PART 1:	20 Multiple Choice Questions	20 Marks
PART 2:	7 Structured Questions	70 Marks
PART 3:	1 Extended Question	10 Marks
	TOTAL	**100 Marks**

- Answer all questions in part 1 and 2 and one in part 3.
- No extra paper is allowed

Use this page for rough work. It will NOT be marked.

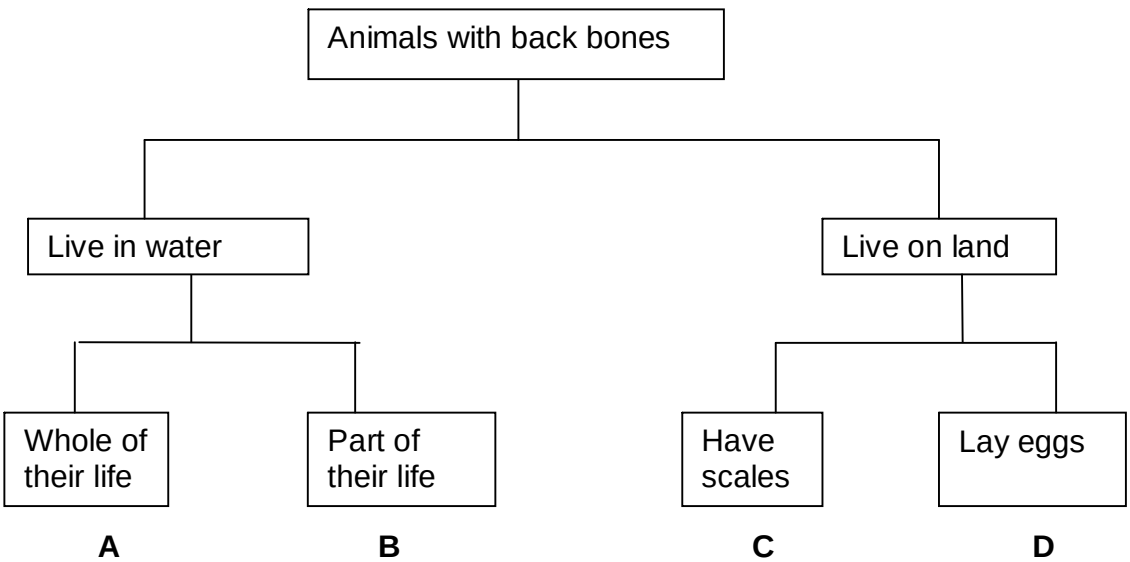
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PART 1: MULTIPLE CHOICE QUESTIONS (20 MARKS)

Instructions for this section:

- Answer all questions in this section.
- For each question in this section, circle the correct answer

1. The rumen of herbivorous animals harbour bacteria which are useful for
   - A water absorption
   - B cellulose digestion
   - C fat emulsification
   - D protein digestion
2. Which of the following characteristics of the living things ensures the continual existence of a species?
   - A Excretion
   - B Digestion
   - C Reproduction
   - D Respiration
3. Study the classification chart below and circle the letter that describes a frog.



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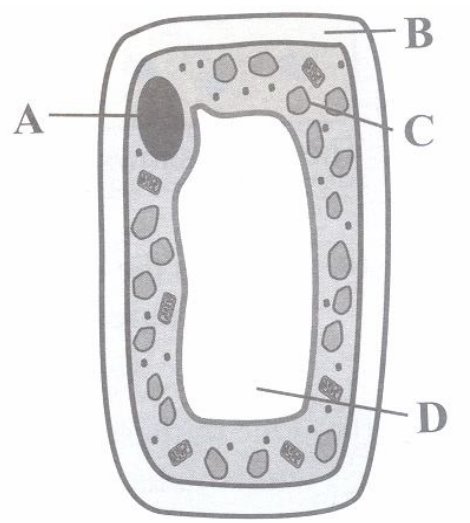
4. The following is a method of breaking seed dormancy.
   - A Exposing seeds to some wavelength of light.
   - B Crushing seeds into powder form.
   - C Boiling seeds to very high temperatures.
   - D Covering seeds with plastic bags.

5. Why is it important that human body temperature is kept at about 37^0 C?
   - A To avoid sweating.
   - B To increase natural immunity of the body.
   - C Because it is the optimal temperature for most enzymes in the body.
   - D Because above or below this temperature, the body is fatigued.

6. The release of an egg from the ovary is described as?
   - A Menstruation
   - B Fertilization
   - C Gametogenesis
   - D Ovulation

7. The domestic cat is biologically known as *Felis domestica*. What does *domestica* represent in this name?
   - A Kingdom
   - B Species
   - C Generic
   - D Family

8. Circle the letter that shows chloroplast in the diagram of a palisade cell from a leaf.



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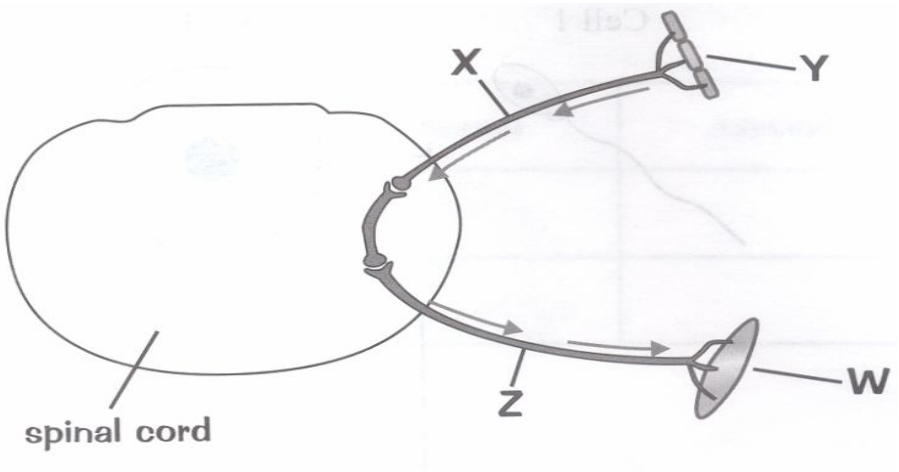
9. The following precaution need ***not*** be taken before blood is transfused from a donor to a recipient.
   A Test for diseases e.g. AIDS
   B Know the donor by name
   C Know the blood group
   D Sterilize the equipment used

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10. How are leaves adapted to absorb light?
   A Change into thorns
   B Have pointed tips
   C Presence of vein like structures
   D Broad and flat surface
11. What would be the phenotype of F1 generation if Tall plant (dominant) is crossed with a Dwarf plant (recessive)?
   A All tall plants
   B Some tall, some dwarf
   C All dwarf plants
   D None of the above
12. Which of the following minerals is a trace element?
   A Sodium
   B Calcium
   C Manganese
   D Chlorine
13. Which of the following may prevent a population from thriving in a particular habitat.
   A Temperature
   B Food supply
   C Altitude
   D Any of these may prevent a population from thriving

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14. The diagram below shows the nerve pathway involved when a person touches a very hot object. Which letter represents the sensory neuron?



A Y
B Z
C X
D W

15. The placenta produces

A Thyroxin
B Glucose
C Eggs
D Estrogen

16. The diffusion of water across a selectively permeable cell membrane is called?

A Dialysis
B Osmosis
C Cytoplasm streaming
D Cohesion

17. Mutations are changes in the

A sugar-phosphate backbone of DNA
B base-pairing rules for DNA
C sequence of bases in DNA
D colour of the skin

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18. Apart from eggs and sperm, different cells in your body are different because they have different

    A Proteins

    B Vitamins

    C Starch

    D Energy

19. Which of the following is **NOT** a deficiency symptom due to lack of Vitamin C?

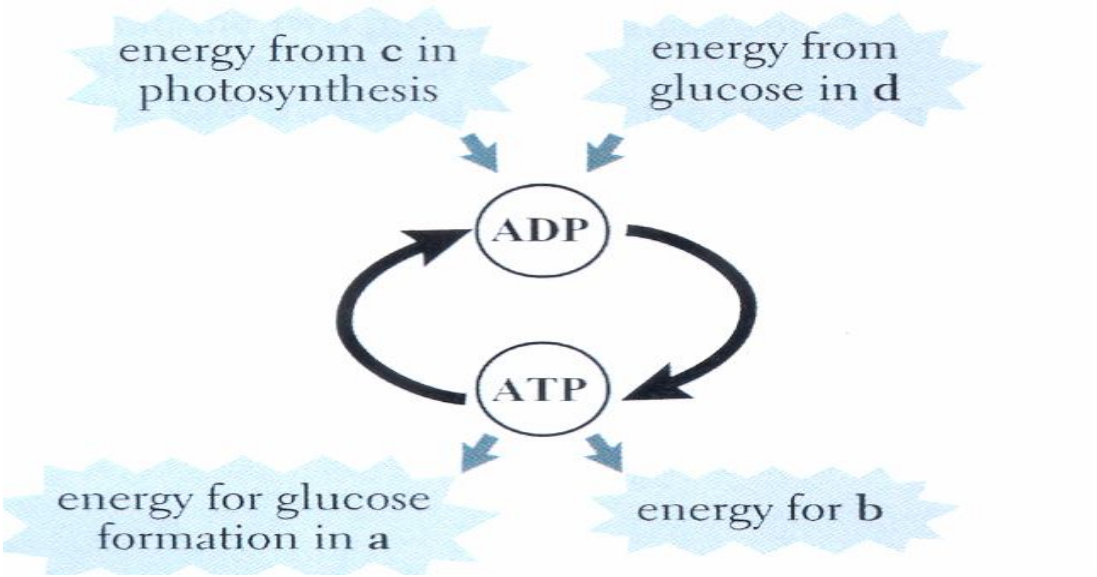
    A Week teeth and bleeding gums

    B Reduced resistance to diseases

    C Scurvy

    D Night blindness

20. The diagram below shows the involvement of ATP in respiration and photosynthesis.



What process is represented by letter **a**

A Osmosis

B Respiration

C Photosynthesis

D Fermentation

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PART 2: STRUCTURED QUESTIONS (70 MARKS)

Question 1 **(11 marks)**

A). a) Complete the table below by putting plus (**+**) if the organ grows toward the stimulus and minus (**-**) if it grows away from stimulus. *Note that one has been filled to guide you.*

	Stimulus		
	Light	Gravity	Water
Shoot			–
Root			

(5 marks)

b) Complete these sentences about tropism by choosing the correct word or words from inside the bracket

i) A shoot is said to be **(positive phototropic/negative phototropic)** (1 mark)

……

ii) A root shows **(positive phototropic/negative phototropic)** (1 mark)

……

B). Insulin production is a good example for practising genetic engineering.

i) Define genetic engineering (2 marks)

……

……

……

ii) Give the vector used for insulin production (2 marks)

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Question 2 **(12 marks)**

A). a) Which organ is responsible for

i. Releasing water by sweating (1 mark)

……..

ii. Reabsorbing water from undigested food to form faeces (1mark)

…….

b) Use words from the list below to complete the sentences below

Glycogen, Serotonin, Insulin, Glucose, Sucrose

i. The release of a substance from platelets is called? (1mark)

……

ii. The blood stream transports a sugar called? (1mark)

……..

iii. To increase the blood sugar level, Glucagon promotes the breakdown of? (1 mark)

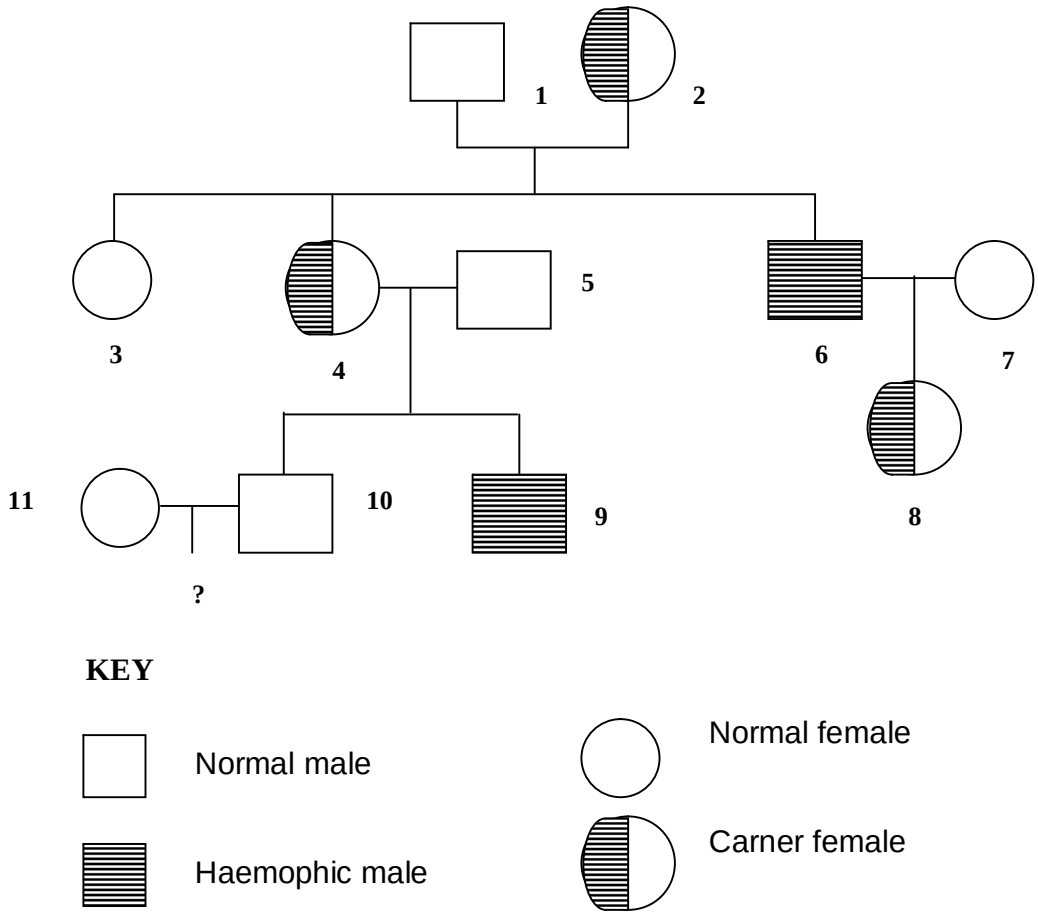
……..

iv. If the blood sugar level gets too high, the endocrine organ secrets another hormone into the blood called? (1mark)

……..

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B). Study the diagram below about a family history of inheritance of Haemophilia.



a). Individual 3 is a girl, what is her genotype? (1 mark)

……

b). Individual 6 is a boy with haemophilia. Suggest why he became haemophilic. (2mks)

……

c). Write possible genotype of individual 4 and 5. (2 marks)

i) individual 4 _____

ii) individual 5 _____

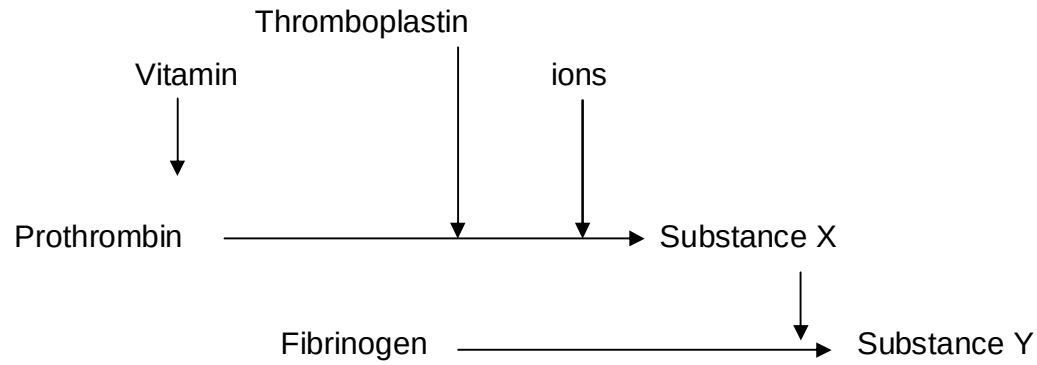
d). What will be the genotype of next born child to individual 10 and 11 ? (1 mark)

……

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Question 3 (8 marks)

Study the diagram below. It represents the process that makes blood clot. Then answer questions below.



a) Give the name of the vitamin needed for blood clotting and the ions? (1 marks)

……

b) Name substance **X** and **Y** (2 marks)

……..

……..

c) Explain why people who are deficient of the vitamin mentioned above bleed profusely after an injury? (2 marks)

……..

……..

……..

i) State the name of a disease which results in the blood not clotting? (1 marks)

……

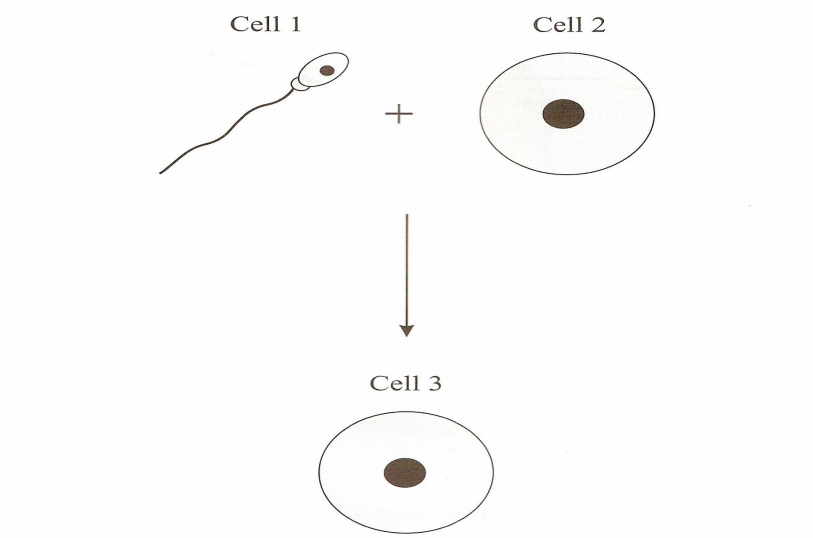
ii) To which category of disease does it belong? (2 marks)

……

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Question 4 **(10 marks)**

A). a) The diagram below shows one stage of human sexual reproduction.



i) How many chromosomes are present in cells 1, 2 and 3? (3 marks)

1……

2……

3……..

b) Apart from stimulating sperm production, state four effects of the hormone testosterone in teenagers. (4 marks)

……

……

……

……

……

……

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B).

i. What is a parasite? (1 mark)

……

……

ii. What is the difference between ectoparasite and endoparasite? (2 marks)

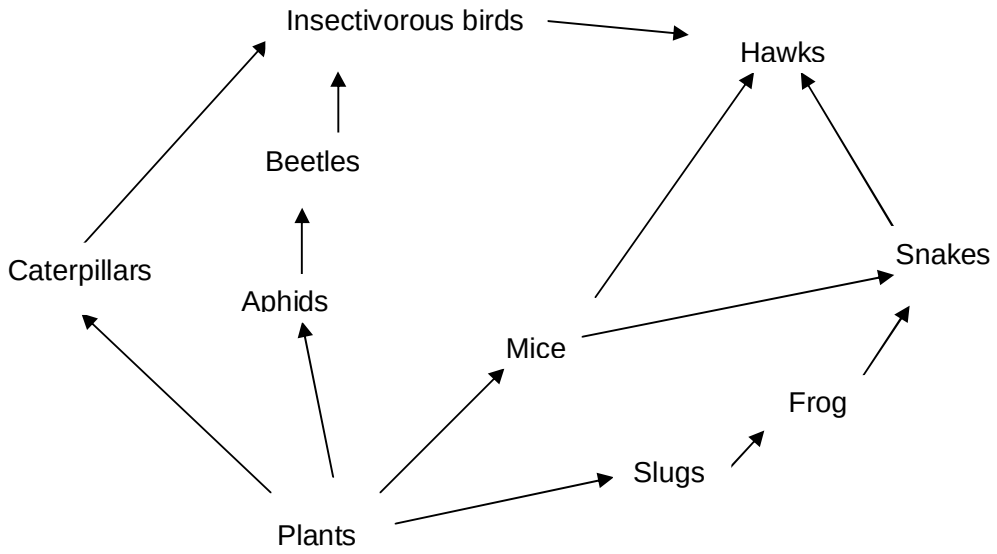
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Question 5 **(10 marks)**

Study the food web shown below and answer the questions that follow.



i. Name the producers in this food web. (1 mark)

……..

ii. State the process by which the organisms you have named above obtain their food? (2 marks)

……..

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iii. Write down a food chain from the food web that ends in quaternary consumers. (2 marks)

……

……

iv. Suggest what would happen in the ecosystem if there is drought? (2 marks)

……

……

……

v. Suggest another group of organisms not shown in this food web that are of great importance? (2 marks)

……

vi. What is the name given to an organism that obtains its food by killing other organisms? (1 mark)

……

Question 6 **(9 marks)**

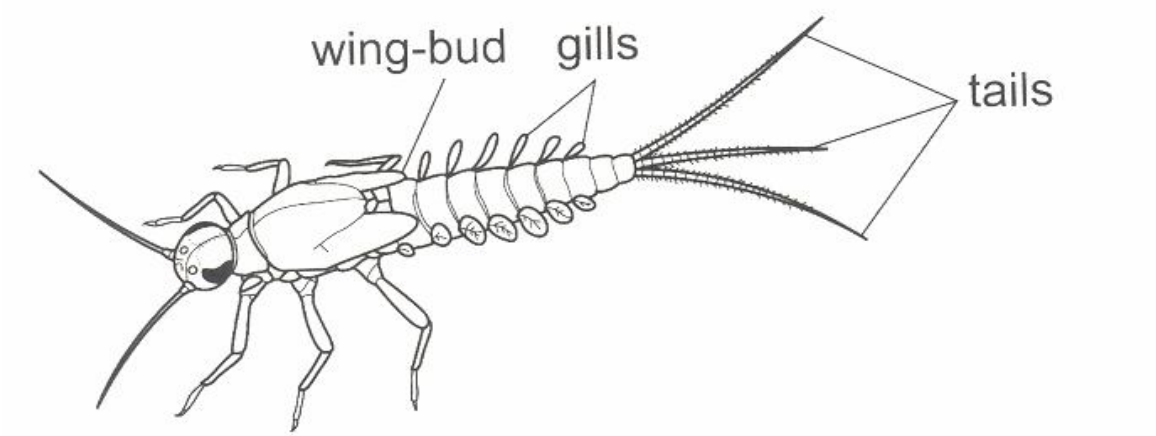
a) Different organisms have different respiratory surfaces and medium of gaseous exchange. Fill in the gaps below;

Organism	**Respiratory surface**
Fish	
Reptiles	
Paramecium	

(3 marks)

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b) The figure below shows a mayfly nymph (a larva) that lives in water.



i. List two features, visible in the figure, that show this is an insect. (2 marks)

……..

……

ii. What special adaptation does the insect show allows it to live in water? (1 mark)

……

c) The dental formula of sheep is as follows;

0 / 3 0 / 1 3 / 3 3 / 3

i. Calculate the number of teeth in a sheep from the data above. (2 marks)

……

……

……

……

ii. What is the name of the gap between incisors and premolars on the lower jaw of sheep? (1 mark)

……

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Question 7 **(10 Marks)**

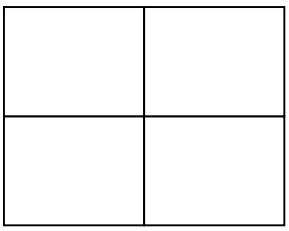
Abdi and Hassan are two tall students having same phenotype but different genotype. You have been asked to find their genotype.

i) Name the process used to find their unknown genotype. (1 mark)

……

ii) Show your work here to find genotype

	Abdi		Short homozygous recessive	
genotype	??	X	……	(1 mark)
law of segregation	……		……..	(1 mark)



(2 marks)

This shows that Abdi has genotype of …….. (1 mark)

	Hassan		Short homozygous recessive	
genotype	??	X	……	(1 mark)
law of segregation	……		……	(1 mark)



This shows that Hassan has genotype of …… (1 mark)

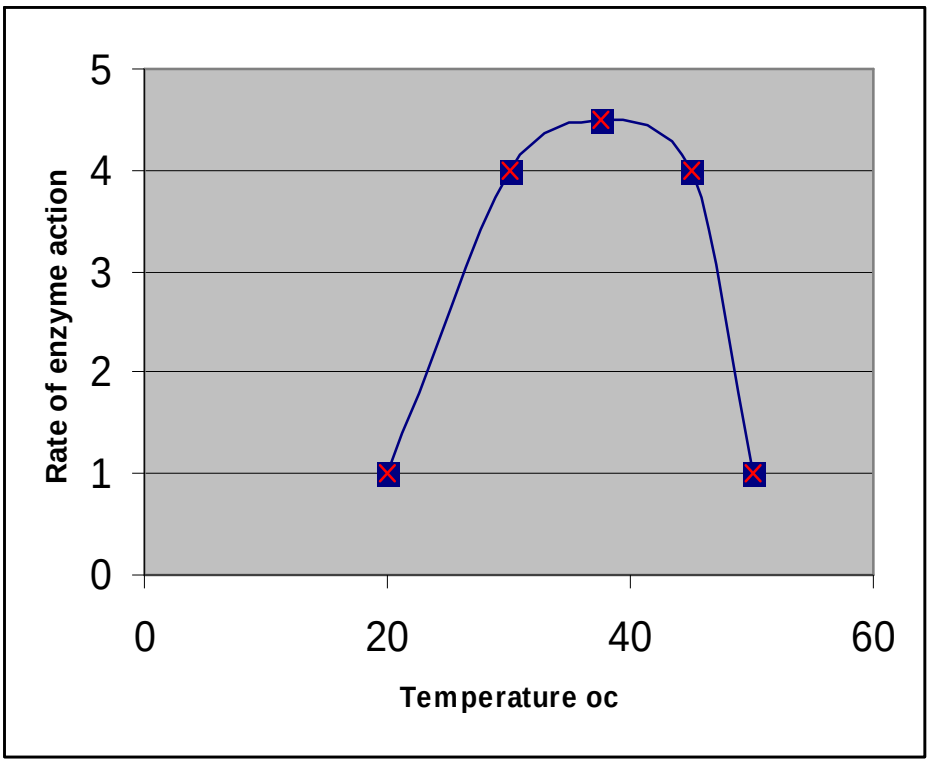
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PART 3: EXTENDED QUESTION (10 MARKS)

Answer one question only

Question 1

a) The graph below shows the rate of enzyme action in relation to changes in temperature



Use the graph to answer the following questions

Explain, giving reasons, the rate of enzyme action

i. Between the first and the second points (2 marks)

……

……

……

……

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ii. At the third point. (2 marks)

……

……

……

……

iii. Between the fourth and the fifth points. (2 marks)

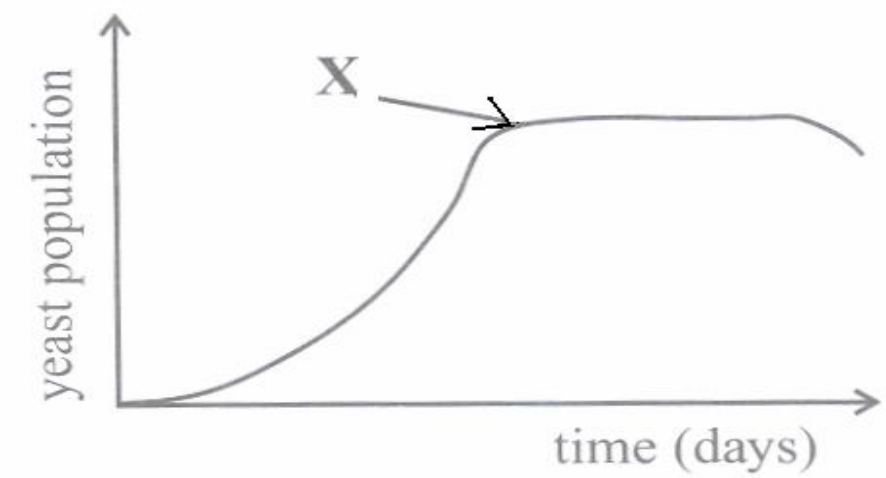
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b) Hamid did an experiment to measure the rate of growth of a yeast population at 25^{o}C. The graph shows his results.



i. Name two conditions, apart from temperature, that Hamid should have kept constant in his experiment. (2 marks)

……

……..

ii. Suggest why the population stops growing at point X. (2 marks)

……

……

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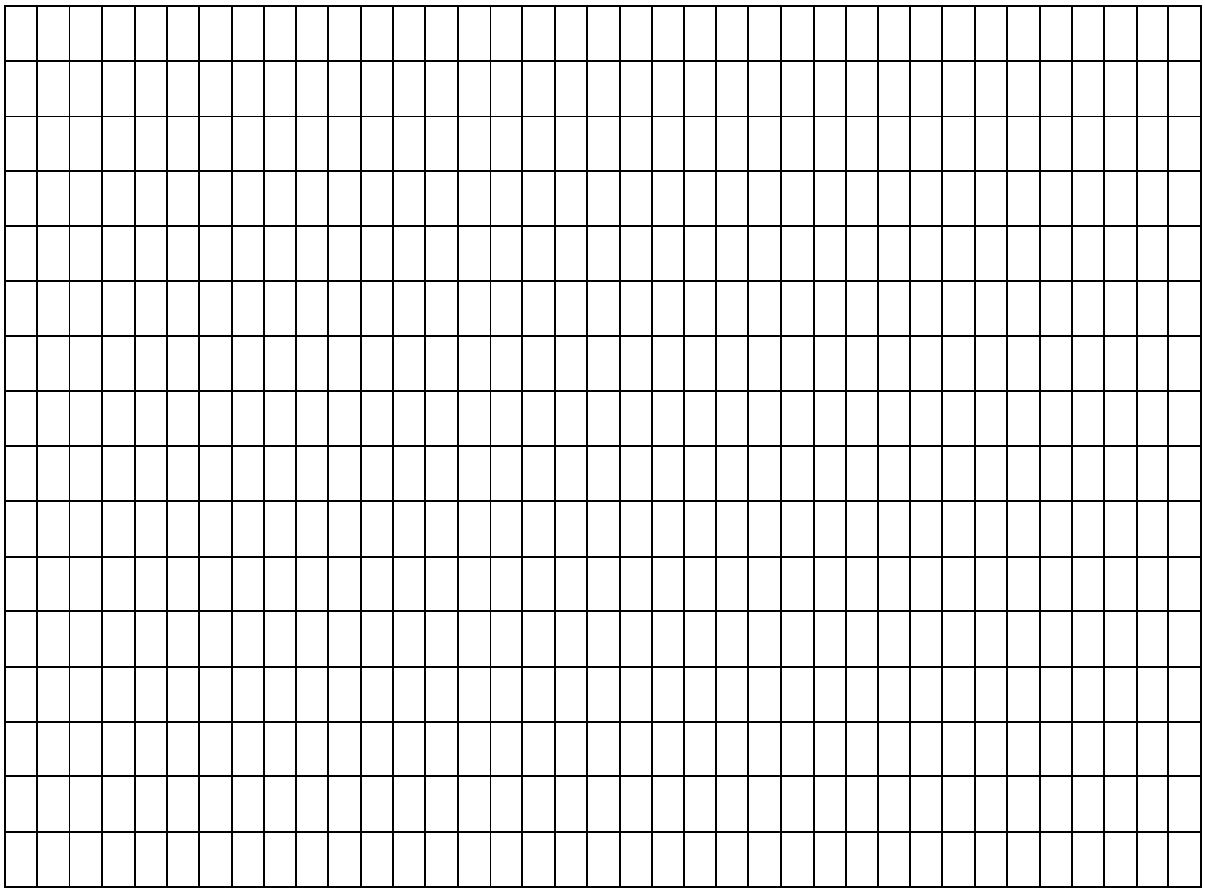
OR

Question 2

The table below shows the relation between urine production and water intake for a period of 18 hours.

Time (Hrs)	**0**	**2**	**4**	**6**	**8**	**10**	**14**	**16**	**18**
Water intake (cm^3)	0	0	1000	1200	1500	2000	2300	1600	1000
Urine output (cm^3)	0	93	95	200	300	425	450	330	95

i. With the help of above table of results, draw a graph of the amount of urine output against time on the grid provided below. (5 marks)



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ii. What is the maximum urine output within the 18 hours period? (2 marks)

……

iii. Compare the relationship between urine production and water intake. (2 marks)

……

……

……

iv. In which hour does the above table show minimum urine output? (1 mark)

……

……

END

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