



ALDENHAM SCHOOL

13 + Entrance Paper

Science

Sample Paper 2009

BIOLOGY (Section 1)

Length of examination – 20 Minutes

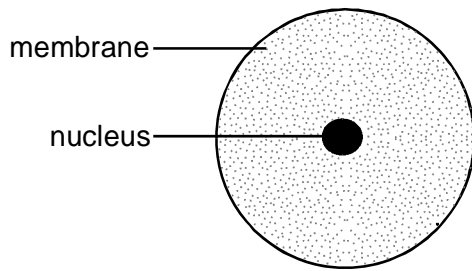
25 Marks

Name:

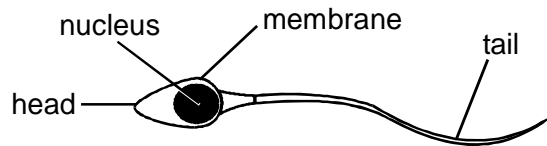
School:

Answer all questions

1. The diagrams below show a human ovum (egg) and a human sperm.



human ovum (egg)



human sperm

not to scale

(a) What are eggs and sperm?
Tick the correct box.

animals cells organs

1 mark

(b) Which part does a sperm use to swim towards an egg?

.....

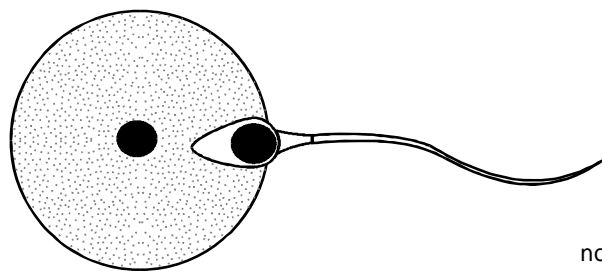
1 mark

(c) Give the name of the male reproductive organ where sperm are made.

.....

1 mark

(d) The diagram below shows a sperm joining with an egg.



not to scale

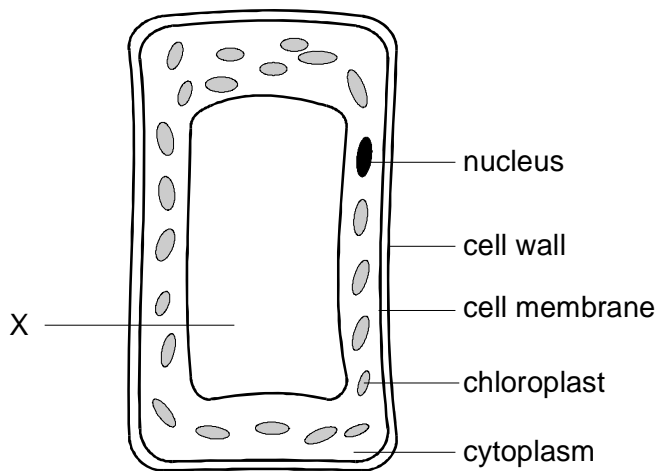
What is this process called?
Tick the correct box.

fertilisation growth
nutrition respiration

1 mark

Maximum 4 marks

2. The diagram shows a plant cell. Some parts of the cell are named.



(a) Which **two named** parts are present in plant cells but not animal cells?

1.

2.

2 marks

(b) Which **named** part contains the genetic information?

.....

1 mark

(c) Which **named** part absorbs light energy for photosynthesis?

.....

1 mark

(d) Name the part labelled **X** on the drawing.

.....

1 mark

(e) where in a plant would you find a cell like the one in the diagram?

Tick the correct box.

in the centre of a root

in the lower surface of a leaf

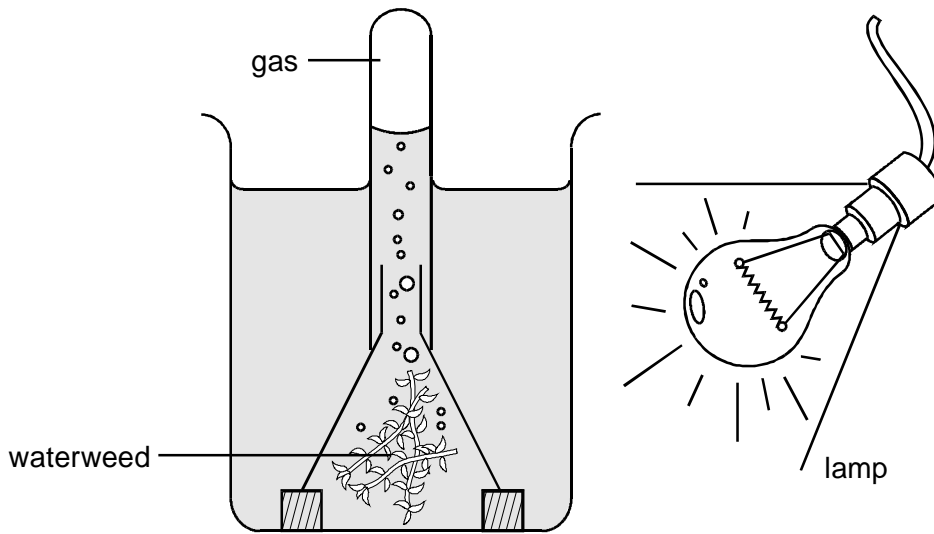
near the upper surface of a leaf

near the surface of a root

1 mark

Maximum 6 marks

3. The rate of photosynthesis can be measured as the volume of oxygen released by a plant per minute. The number of bubbles of gas released per minute from waterweed is counted.

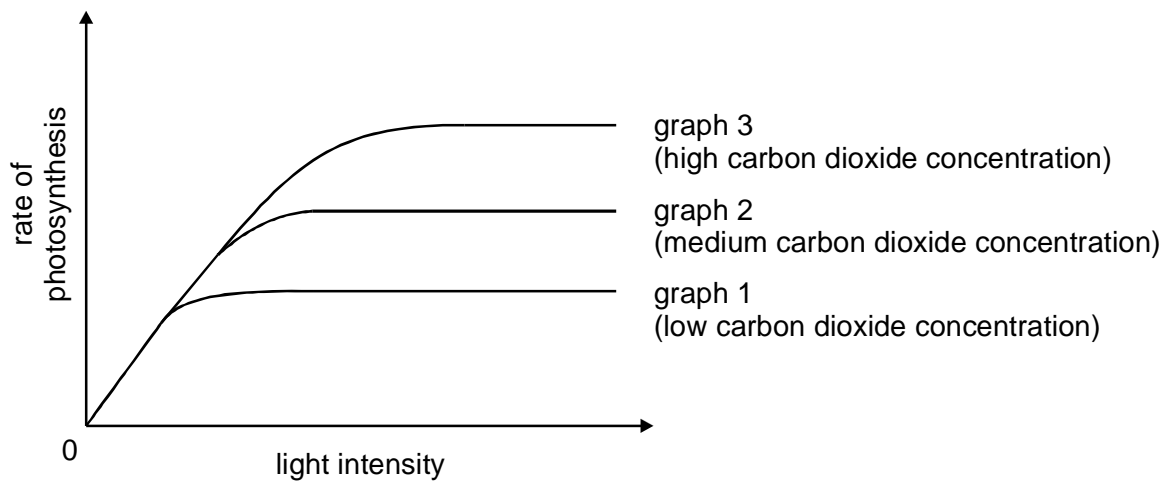


- (a) The gas collected in this experiment is **not** pure oxygen. Suggest a reason for this.

.....

1 mark

- (b) The graphs below show the effect of light intensity on the rate of photosynthesis at different carbon dioxide concentrations.



- (i) Explain what the graphs show.

.....

2 marks

- (ii) Many years ago, gardeners used to keep a large tub of fresh manure in their greenhouses. The manure was **not** added to the soil in which the plants were growing, but the plants grew more quickly in greenhouses containing a tub of manure.

Suggest how the activity of bacteria in the manure led to an increase in the rate of photosynthesis in these plants.

.....

2 marks

- (c) Enzymes are involved in the process of photosynthesis. If the temperature is too high, the enzymes stop working and photosynthesis stops.

Why do the enzymes stop working at high temperatures?

.....

1 mark

Maximum 6 marks

4. The information below was taken from the label of a can of baked beans in tomato sauce.

nutritional information		list of ingredients
100g provides:		haricot beans, tomato purée, water, sugar, modified starch, salt, paprika, onion powder, herb extracts, spices
energy	406 kJ	
protein	5.4 g	
total carbohydrate	17.6 g	
sugar	6.0 g	
fat	0.4 g	
fibre	3.7 g	

- (a) A healthy diet contains a number of groups of substances. The nutritional information lists some of these.

Give **one** group of substances, needed for a healthy diet, which is missing from the nutritional information.

.....

1 mark

- (b) (i) Which food, shown in the list of ingredients, provides the most protein in this can?

.....

1 mark

(ii) Give **one** reason why we need protein in our diet.

.....

1 mark

(c) (i) Name **one** food, shown in the list of ingredients, which provides fibre.

.....

1 mark

(ii) Why is fibre needed for a balanced diet?

.....

.....

1 mark

Maximum 5 marks

5. The food chain below shows the feeding relationships between some organisms living in the Arctic.

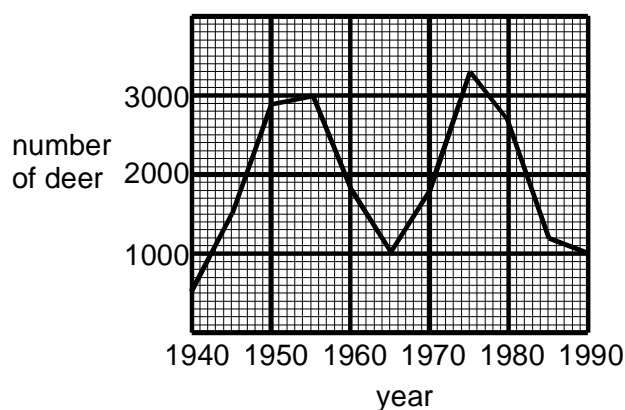


(a) Which organism in the food chain is a predator?

.....

1 mark

In one area of the Arctic the number of deer has been counted every five years since 1940. The graph shows the number of deer.



(b) Suggest a reason why the deer population changed between 1975 and 1990.

.....

.....

1 mark

(c) The population of wolves in the area also changed.

(i) What is likely to have happened to the number of wolves between 1980 and 1990?

.....

1 mark

(ii) The number of **deer** in 1946 was about the same as in 1960. Suggest why the number of **wolves** was probably higher in 1960 than in 1946.

.....

1 mark

Maximum 4 marks