



Cambridge IGCSE™

BIOLOGY

Paper 1 Multiple Choice (Core)

0610/12

May/June 2020

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

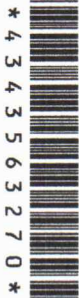
- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

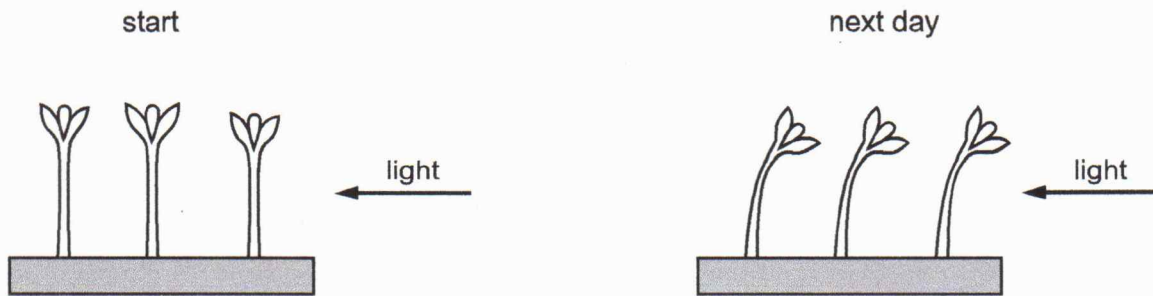
- The total mark for this paper is 40.
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.



This document has **16** pages. Blank pages are indicated.



- 1 The diagram shows what happened in an experiment with plant seedlings.



Which characteristic of living things made the seedlings grow towards the light?

- A excretion
 B nutrition
 C respiration
 D sensitivity
- The shoot grows towards light; this enables it to absorb light energy that is necessary for photosynthesis. It shows positive phototropism.*

- 2 A rat has the scientific name *Rattus rattus*.

What do the two parts of this name refer to?

- A genus and species
 B kingdom and genus
 C kingdom and species
 D variety and genus
- Rattus refers to the genus name, while rattus is a species name. This is based on the binomial naming system.*

- 3 Which list contains **only** arthropods?

- A amphibians, insects, myriapods
 B arachnids, crustaceans, myriapods
 C crustaceans, insects, fish
 D insects, myriapods, reptiles

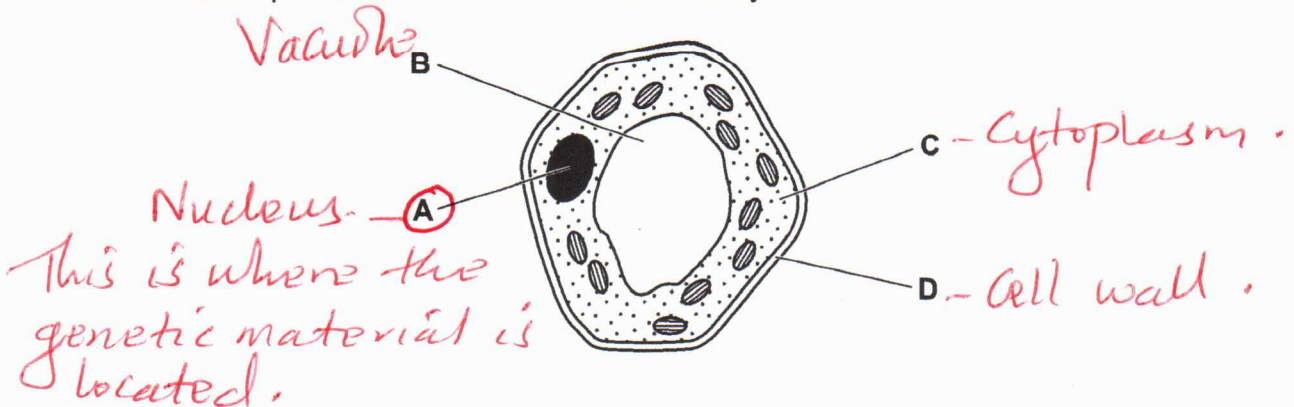
Arthropods consist of the arachnids, crustaceans and the myriapods for the choice A. Insects are also arthropods.

An arthropod is an invertebrate animal having an exoskeleton, a segmented body and paired jointed appendages.

4 The diagram shows a plant cell.

A biologist wants to find out the number of chromosomes it contains.

Which labelled part should be examined more closely?

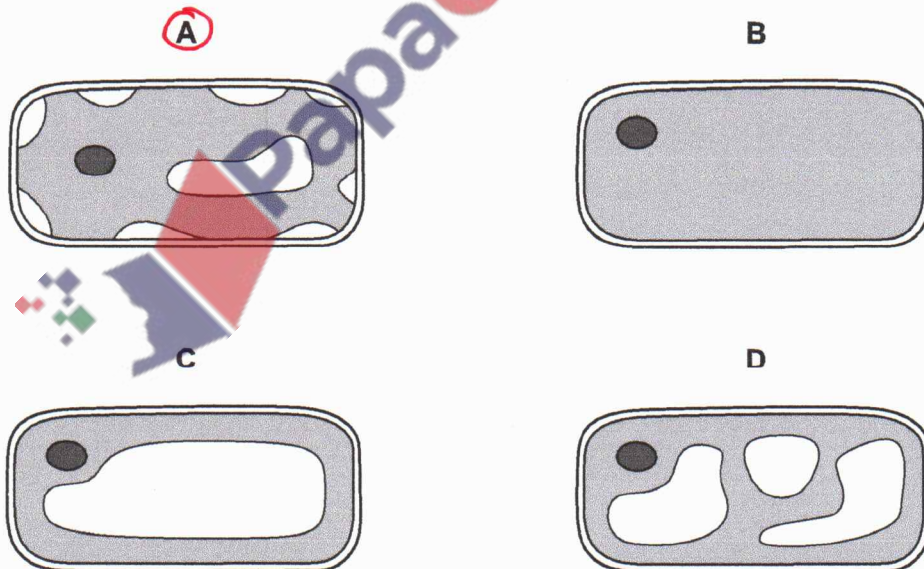


5 What are leaves examples of?

- A cells
- B organs
- C organ systems
- D tissues

A leaf is an organ because it is made up of several tissues such as palisade tissue, epidermal tissue, spongy mesophyll tissue that are used to facilitate the photosynthesis process.

6 Which diagram shows the appearance of a plant cell several minutes after it has been placed in a concentrated solution of sugar?



Plant cell in a concentrated solution of sugar loses water by osmosis across the partially permeable membrane; hence it becomes flaccid; excessive loss of water makes the plant cell to become plasmolysed, a process known as plasmolysis.

- 7 Uncooked pieces of potato of identical size were placed in different liquids for one hour and then measured.

Which liquid will cause a decrease in the size of the piece of potato?

- A pure water
 B sugar solution less concentrated than the potato cell contents
 C sugar solution more concentrated than the potato cell contents
 D sugar solution with the same concentration as the potato cell contents

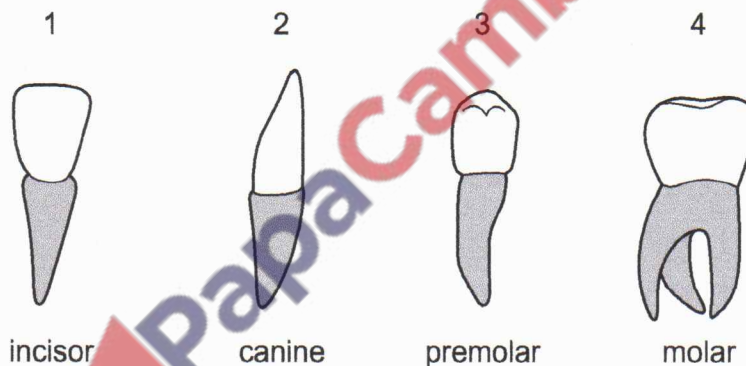
Decrease in size means the piece of potato lost water by osmosis to the surrounding liquid and became flaccid.

- 8 Which food-testing solution shows a positive result when it turns from blue to purple?

- A Benedict's solution
 B biuret solution
 C ethanol
 D iodine solution

Biuret solution is used to test for presence of proteins; it is blue in colour; positive results for proteins shows the purple colour.

- 9 The diagram shows the four types of human tooth.



Which teeth are used for grinding food?

- A 1 and 2
 B 2 and 3
 C 3 and 4
 D 4 and 1

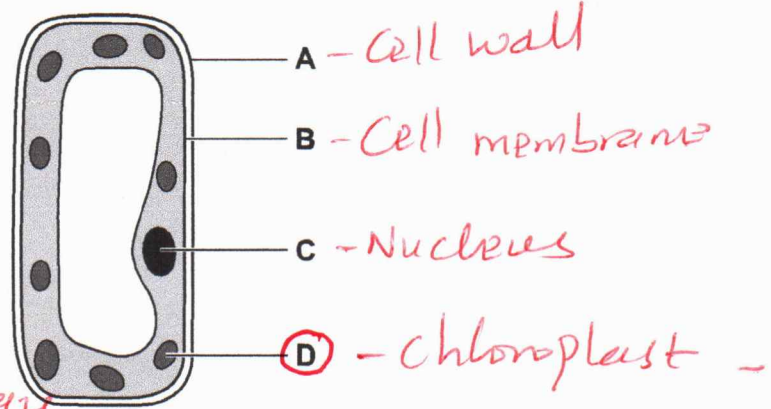
Teeth 3 and 4 because they have a large surface area for grinding food as well as the presence of cusps. Tooth 3 is a premolar and 4 is a molar; these are used to grind food before being rolled into food boluses.

10 The diagram shows a plant cell.

In which part of the cell does photosynthesis occur?

Chloroplast is the site of the photosynthesis.

It contains green pigment chlorophyll that traps light energy for photosynthesis.

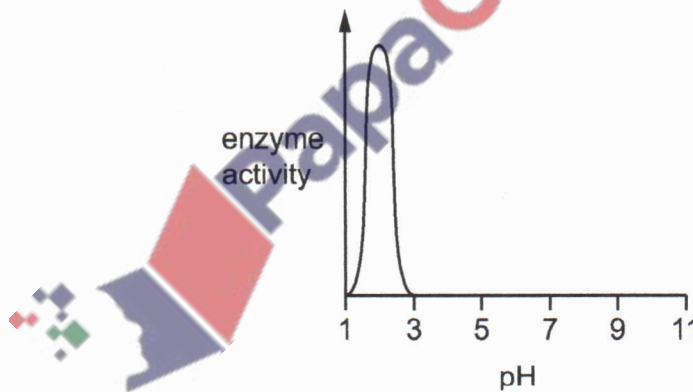


11 Which substance found in a healthy diet helps to prevent constipation?

- A fat
- B fibre
- C minerals
- D vitamins

Fibre increases the surface area for the digestion of food and also helps to conserve water in the gut thus preventing constipation.

12 The graph shows the effect of pH on the activity of an enzyme.



In which part of the alimentary canal would this enzyme be **most** active?

- A large intestine
- B mouth
- C small intestine
- D stomach

This enzyme is most active in the stomach because it works best in acidic medium; which is in the stomach due to the presence of the hydrochloric acid in the stomach.

13 After passing through the root hair cells of a plant, what is the next tissue through which water passes?

- A cortex
- B epidermis
- C mesophyll
- D xylem

Water molecules from the soil enters the root hair cells by osmosis; from the root hair cells the water enters the cortex cells and then epidermis before moving into the xylem vessels.

14 From which part of a leaf does most water evaporate during transpiration?

- A the cuticle
- B the guard cells
- C the spongy mesophyll cells
- D the xylem vessels

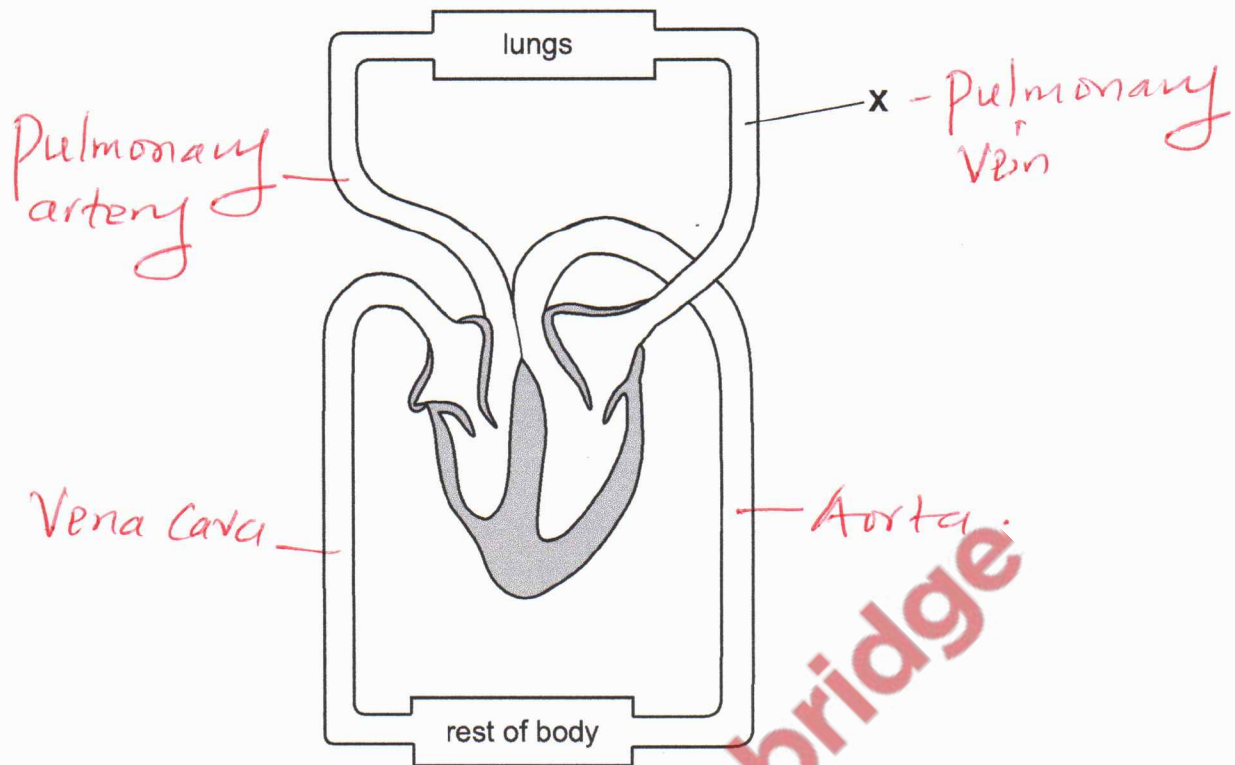
The spongy mesophyll cells have lots of airspaces that provide large surface area for the process of evapotranspiration.

15 Which blood vessel carries blood to the muscle of the heart?

- A coronary artery
- B pulmonary artery
- C renal vein
- D vena cava

The heart muscles are supplied with oxygenated blood through the coronary artery.
 Pulmonary artery transports deoxygenated blood from the heart to the lungs.
 Renal vein transports blood from the kidney to the vena cava.
 Vena cava transports deoxygenated blood from various body parts back to the heart.

16 The diagram shows the human heart and main blood vessels.



What is the blood vessel labelled X?

- A aorta
- B pulmonary artery
- C pulmonary vein
- D vena cava

It is a pulmonary vein because it carries oxygenated blood from the lungs to the left chambers of the heart.

17 What is a chemical barrier to pathogens?

- A nose hairs
- B skin
- C stomach acid
- D white blood cells

Stomach acid also called hydrochloric acid is a chemical found in the stomach which kills any pathogen present in the food reaching the stomach.

18 What is the site of gas exchange in humans?

- A nose
- B alveoli
- C bronchus
- D trachea

Alveoli are tiny structures found in the lungs in humans; these structures are well adapted to facilitate the exchange of respiratory gases between them and blood.

19 The substances listed are associated with aerobic respiration.

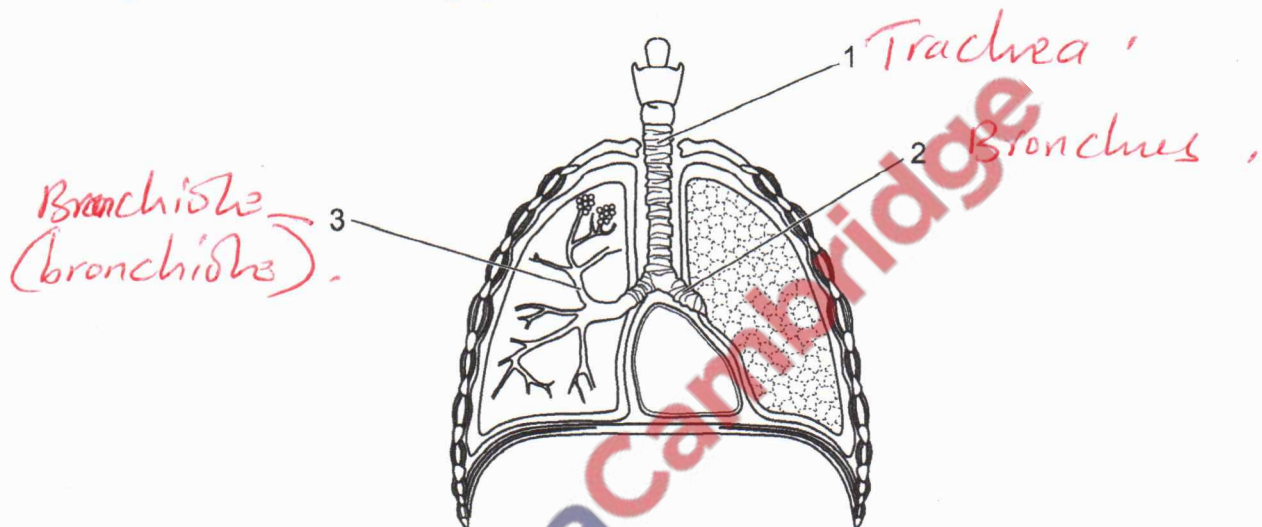
- 1 carbon dioxide
- 2 glucose
- 3 oxygen
- 4 water

Aerobic respiration involves glucose and oxygen; where glucose is oxidised to produce carbon dioxide, water and energy.

Which substances are the products of aerobic respiration?

- A 1 and 3 **B** 1 and 4 C 2 and 3 D 3 and 4

20 The diagram shows the breathing system.



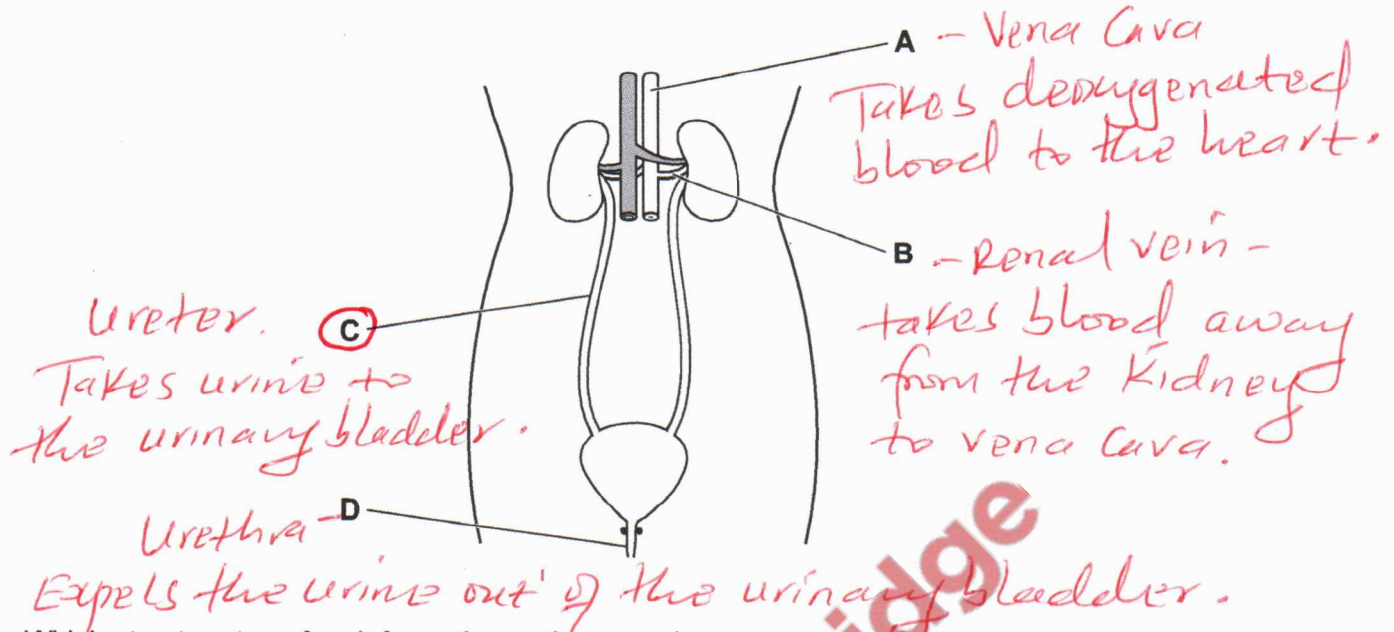
What are the labelled structures?

	1	2	3
A	bronchus	bronchiole	trachea
B	bronchiole	bronchus	trachea
C	trachea	bronchus	bronchiole
D	trachea	diaphragm	bronchus

The air flows from the atmosphere through the nostrils to the trachea; it flows down to the bronchus then bronchiole and finally to the alveoli in the lungs; during breathing in.

21 The diagram shows the human excretory system.

Which labelled structure is the ureter?



22 Which structure transfers information to the central nervous system?

- A effector
- B motor neurone
- C relay neurone
- D sensory neurone

Sensory neurone transmits impulses from the CNS to the receptor.
Motor neurone transmits impulses from CNS to the effector.
Relay neurone transmits impulses from sensory to motor neurone.

23 Examples of responses to hormones are listed.

- 1 increased breathing rate
- 2 increased pulse rate
- 3 growth of body hair
- 4 widened pupils

Which responses are caused by the hormone adrenaline?

- A 1, 2, 3 and 4
- B 1, 2 and 4 only
- C 2, 3 and 4 only
- D 3 and 4 only

Growth of body hair is a normal body process as a result of protein production.

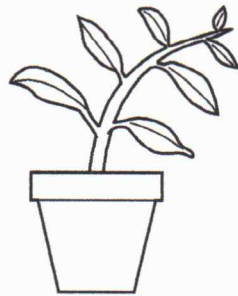
Adrenaline hormone; leads to widened pupils to have proper vision for enemies, increased pulse rate to supply more glucose and oxygen to muscles and brain cells. Increased breathing rate to provide more oxygen.

24 Which part of the eye focuses light?

- A cornea
- B iris
- C lens
- D retina

Lens are used to focus light onto the light sensitive structures called retina for the formation of the image.

25 The diagram shows a plant shoot growing towards the light.



← light

gravitropism is the growth response to or away from gravity

Which response is shown by the shoot of the plant?

- A gravitropism
- B photosynthesis
- C phototropism
- D reflex

The shoot grows towards the direction of source of light hence showing positive phototropism.

26 Which statement about antibiotic use in humans is correct?

- A Different types of antibiotic are used to remove antibodies from the body.
- B Antibiotics are injected in childhood to prevent diseases in adults.
- C Antibiotics are used to treat diseases caused by viruses.
- D Different types of antibiotic are used because bacteria can become resistant.

Humans use different antibiotics to kill all the bacteria in the body.

27 Which conditions are always required for the germination of seeds?

	condition			
	light	oxygen	suitable temperature	water
A	✓	✓	x	✓
B	✓	x	✓	x
C	x	✓	x	✓
<input checked="" type="radio"/> D	x	✓	✓	✓

Conditions necessary for seed germination include oxygen, water and a suitable temperature.

key
 ✓ = required
 x = not required

28 Where do fertilisation and pollination occur in a flower?

	fertilisation	pollination
A	carpel	ovule
B	ovary	stigma
C	stigma	anther
D	style	carpel

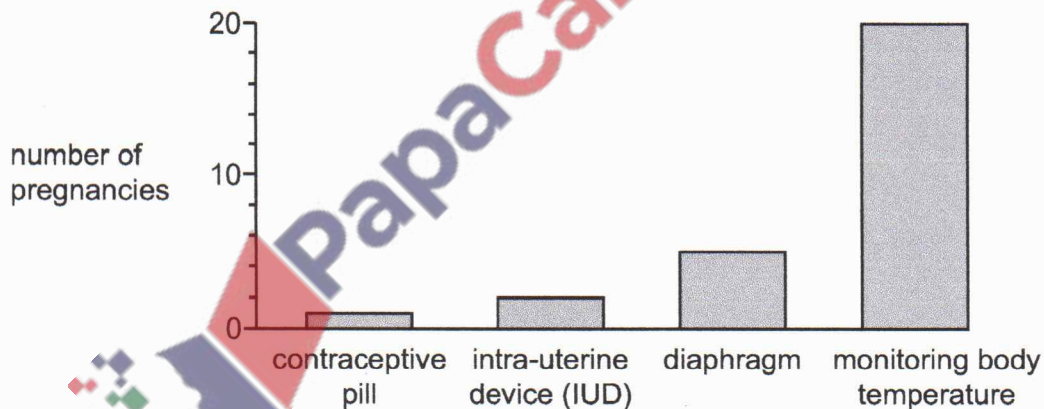
Pollination is the transfer of pollen grains from the anther to the stigma.
Fertilisation is the fusion of male and female gametes to form a zygote.

29 When do the following stages occur in a typical human menstrual cycle?

	bleeding	ovulation
A	days 13 – 14	days 6 – 25
B	days 1 – 4	days 27 – 28
C	days 6 – 25	days 1 – 4
D	days 1 – 4	days 13 – 14

Bleeding occurs between day 1 and 4 due to the breakdown of uterine wall.
Ovulation occurs at day 14 or even 13 - involves release of the egg cell.

30 The graph shows the number of pregnancies in 4 groups of 100 women. Each group used a different method of contraception.



The method of contraception which is the **most** effective is

- A barrier.
- B** chemical.
- C natural.
- D surgical.

Contraceptive which is a chemical method of contraception showed a very low number of pregnancies meaning is the most effective of all the four methods.

31 The photograph shows a tiger.



Which visible adaptive feature makes the tiger a good predator?

- A large teeth
- B long whiskers
- C small ears
- D thick fur

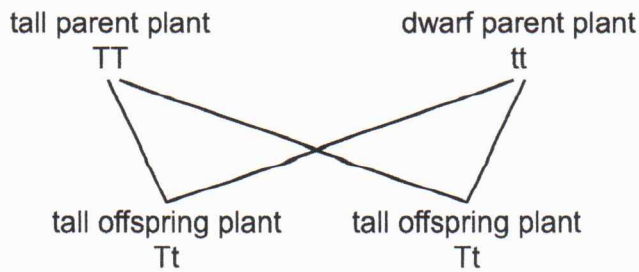
The large and sharp teeth of the tiger shows it can easily grasp and tear off its prey thus killing it faster.

32 Which statement about the human sex chromosomes is correct?

- A Females have an X chromosome and a Y chromosome.
- B Females have two Y chromosomes.
- C Males and females have at least one X chromosome.
- D Males and females have at least one Y chromosome.

Males usually are heterozygote to the sex chromosomes; they have XY chromosomes; while the females are homozygotes; that is, they have XX chromosomes; as their genotypes.

33 The diagram shows the inheritance of height in pea plants.

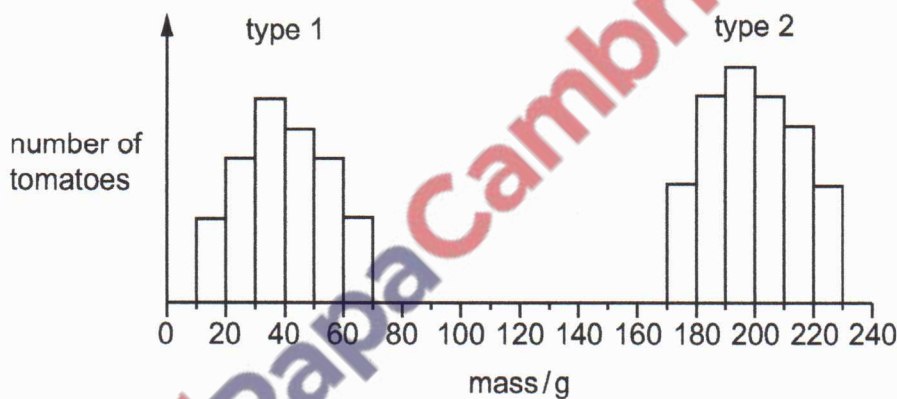


Which plants have a heterozygous genotype?

- A both parent plants
- B dwarf parent plant only
- C** both offspring plants
- D tall parent plant only

Heterozygous genotype has one dominant and one recessive allele e.g. Tt; hence both offspring are heterozygous.

34 The graph shows the masses of two different types of tomato.



What can be concluded from the graph?

- A Genes do not affect the mass of tomatoes.
- B** Type 1 tomatoes show continuous variation.
- C Type 2 tomatoes are sometimes smaller than type 1 tomatoes.
- D Type 2 tomatoes show discontinuous variation.

Type 1 shows continuous variation because there are various intermediates in the number and mass of tomatoes.

35 Which is an example of a population?

- A all the animals and plants living in a lake
- B all the different herbivores in a forest
- C** all the mahogany trees growing in a forest
- D all the species of animals in Africa

Population involves a group of organisms of the same species living in a given area at a given time.

36 The diagram shows a food chain in a rock pool.

seaweed → whelks → crabs → seagulls

What will happen if the number of secondary consumers increases?

There will be

- Crabs are the secondary consumers; if the crabs increase, then the rate of whelks consumption is high thus reducing their population; seaweed population will increase due to reduced whelks.*
- A fewer crabs.
 - B fewer seagulls.
 - C fewer whelks.
 - D less seaweed.

37 What is the role of anaerobic respiration in bread-making?

- Anaerobic respiration of yeast cells produces carbon dioxide alongside ethanol. The CO₂ raises the dough.*
- A to produce alcohol to flavour the bread
 - B to produce gas to make the bread rise
 - C to release enough energy to bake the bread
 - D to release enough lactic acid to kill the yeast

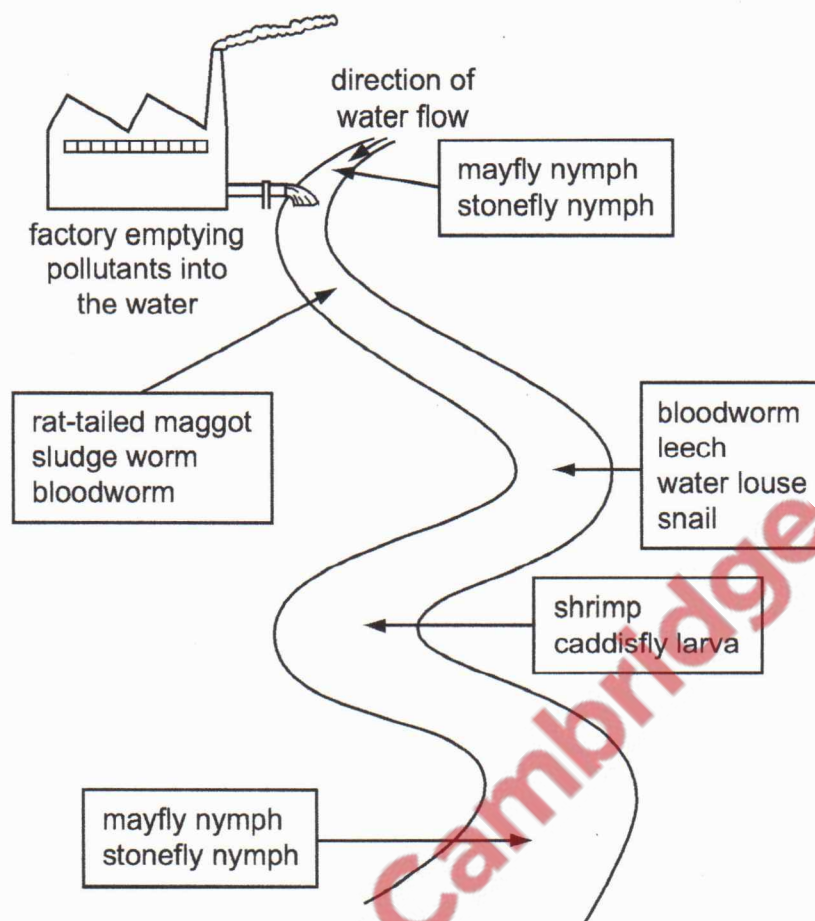
38 A crop plant has been genetically modified to make it resistant to herbicides.

Which is a possible disadvantage of introducing this new crop plant?

- A Loss of weeds reduces competition.
- B Some weeds might become resistant to the herbicide.
- C The crop plant is unharmed and produces a higher yield.
- D The new gene will appear in new generations of the crop.

This will lead to regular use of herbicides in the farm to kill the weeds. The regular use of herbicides will make some weeds to become resistant to it due to mutations.

- 39 The diagram shows the results of a survey on the types of animals found along a stretch of river near to a factory.



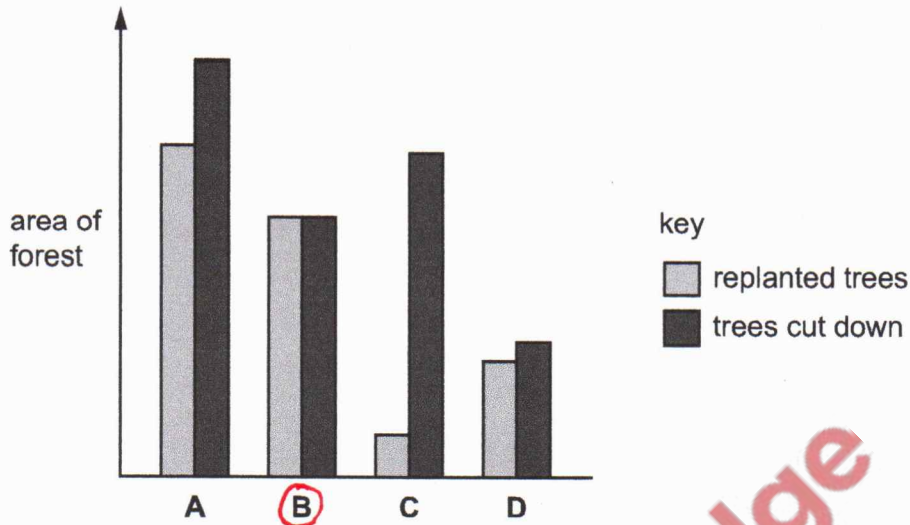
Which animal lives in the least polluted water?

- A bloodworm
- B caddisfly larva
- C leech
- D stonefly nymph

Stonefly nymph is far away from the main source of pollution; that is, the region where the factory empties its pollutants into the water. Hence most of the pollutants would have reduced in number.

- 40 The graph shows four areas of forest that were cut down and then replanted with trees in one part of the world between 1995 and 2015.

Which area of forest was used most sustainably?



Area B was used most sustainably because the total number of trees planted back were equal to the number of trees that had been cut. This is also same to the total area cleared.



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