



GCSE Biology Question and Answers 2020/2021

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* = topics that contain interactive resources, multiple choice questions or audio files. To interact with this content, please go to www.s-cool.co.uk/biology.

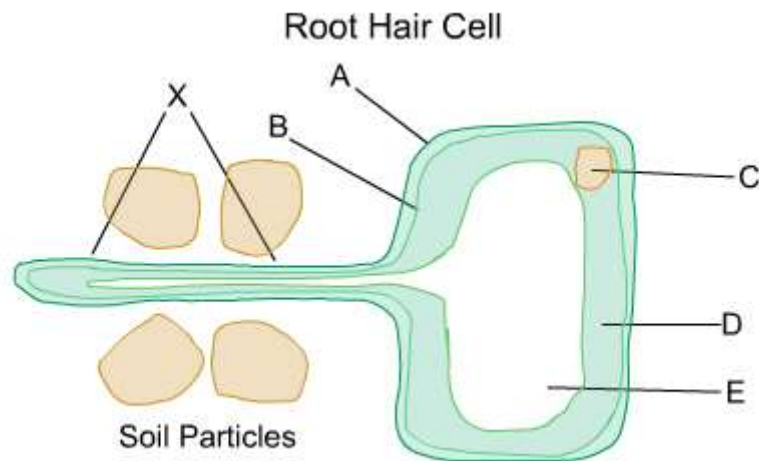
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Cells (Questions)

1. Name 2 things that are present in plant cells but not in animal cells.

(Marks available: 2)

2. Look at the drawing of a root hair cell from a plant:



- a) Name regions A,B and C.

(3 Marks)

- b) What substance is Region B made of?

(1 Mark)

- c) Name the letter of the region which:

(i) Is Selectively Permeable;

(ii) Controls the activities of the cell.

(2 Marks)

- d) Type in the letter of one region which provides support for the cell.

(1 Mark)

e) What is the function of Region X?

(1 Mark)

f) (i) What is the name of the structure, commonly present in leaf cells, which are missing from the root hair cell?

(ii) Why is this structure missing?

(2 Marks)

Cells (Answers)

Answer outline and marking scheme for question: 1

Choose from any of the following:

- Cellulose cell wall
- Chloroplast
- Vacuole

(Total = 2 marks)

Answer outline and marking scheme for question: 2

a) Region A is the Cell Wall;

Region B is the Cell Membrane;

Region C is the Nucleus.

(3 marks)

b) Region B is made out of protein and lipid.

(1 mark)

c) i) Region B is selectively permeable;

ii) Region C controls the activities of the cell.

(2 marks)

d) Regions A & E provide support for the cell.

(1 mark)

e) To increase the surface area & speed up the absorption of substances from the soil.

(1 mark)

f) i) Chloroplasts.

ii) Chloroplasts absorb light energy for photosynthesis. As there is no light in the soil, there is no survival value to root cells in containing chloroplasts.

(2 marks)

Defence against Disease (Questions)

1. What are the 2 ways in which bacteria can make us ill?

(Marks available: 2)

2. What are the 5 main areas in which invaders try to enter our bodies?

(Marks available: 5)

3. What are the 3 different ways the immune system can act?

(Marks available: 3)

Defence against Disease (Answers)

Answer outline and marking scheme for question: 1

(i) Damaging our cells;

(ii) Producing poisonous toxins.

(Total = 2 marks)

Answer outline and marking scheme for question: 2

Skin;

Eye;

Respiratory system;

Reproductive system;

Digestive system.

(Total = 5 marks)

Answer outline and marking scheme for question: 3

Consume the invaders

Produce antibodies

Produce antitoxins

(Total = 3 marks)

Drugs (Questions)

1. Read the following passages and then label them with the type of drug they are referring to...

a) Activity of the nervous system is reduced. Responses slow you down and you become sleepy.

(1 mark)

b) Provide a feeling of sleepiness and calm when first taken. Motivation decreases and your body deteriorates both mentally and physically.

(1 mark)

c) Increases activity of the nervous system. Raises alertness, emotions or mood.

(1 mark)

d) A feeling of endless energy and universal love soon develops into a danger of overheating, dehydration and collapse.

(Marks available: 4)

2. Alcohol and tobacco are the 2 main (non-medical) drugs, which are allowed in this country. But don't be fooled - they can lead to a lot of harm, just like the other drugs can.

Name 2 harmful effects from alcohol and 2 from smoking tobacco.

(Marks available: 4)

3. Name 3 legal and 3 illegal drugs.

(Marks available: 6)

Drugs (Answers)

Answer outline and marking scheme for question: 1

a) Depressants;

(1 mark)

b) Pain killers;

(1 mark)

c) Stimulants;

(1 mark)

d) Hallucinogens.

(1 mark)

(Total = 4 marks)

Answer outline and marking scheme for question: 2

Alcohol: Any 2 of the following...

- liver damage / disease
- brain damage
- impaired judgement
- can cause severe depression
- memory loss
- cancer
- social life

Tobacco: Any 2 of the following...

- lung cancer
- heart disease
- lungs get clogged up
- emphysema
- bronchitis
- smokers cough
- brokenness!

(Total = 4 marks)

Answer outline and marking scheme for question: 3

Legal: Any 3 of the following...

- penicillin
- aspirin
- caffeine
- tobacco
- alcohol
- insulin
- paracetamol

Illegal: Any 3 of the following...

- cannabis
- cocaine
- heroine
- ecstasy
- LSD
- morphine

(Total = 6 marks)

Environment (Questions)

1. Arrange this food chain in the correct order, starting with the producer:

Ladybird/Hawk/Greenfly/Rose bush/Sparrow

(Marks available: 5)

2. What does the width of each trophic level tell you?

(Marks available: 1)

3. Give the main survival advantage of each of the following adaptations:

For example, a rabbit's large ears allow it to hear predators from far away.

a) A polar bear's white coat;

b) A hedgehog's spikes;

c) A cheetah's bendy spine;

d) An eagle's sharp claws;

e) A lion's powerful teeth.

(Marks available: 5)

Environment (Answers)

Answer outline and marking scheme for question: 1

- a) Rose bush
- b) Greenfly
- c) Ladybird
- d) Sparrow
- e) Hawk

(Total = 5 marks)

Answer outline and marking scheme for question: 1

How many there are of each type of organism.

(Total = 1 marks)

Answer outline and marking scheme for question: 1

- a) Camouflaged body so its prey doesn't see it creeping up in the snow;
- b) Protection from predators;
- c) Flexibility allows the cheetah to reach its maximum speed quickly and smoothly;
- d) So it can dive down and grab its prey quickly and not drop it;
- e) So it can tear and grind meat easily.

(Total = 5 marks)

Environmental Problems (Questions)

1. Label the following as "renewable" or "fossil" fuels...

- a) gas;
- b) coal;
- c) straw;
- d) water;
- e) petroleum;
- f) wood.

(Marks available: 6)

2. What are the 2 main greenhouse gases?

(Marks available: 2)

3. Name and briefly describe the 4 main effects of deforestation.

(Marks available: 8)

Environmental Problems (Answers)

Answer outline and marking scheme for question: 1

- a) fossil;
- b) fossil;
- c) renewable;
- d) renewable;
- e) fossil;
- f) renewable.

(Total = 6 marks)

Answer outline and marking scheme for question: 2

- (i) Carbon dioxide;
- (ii) Methane.

(Total = 2 marks)

Answer outline and marking scheme for question: 3

- a) Decrease in rainfall - less trees means less transpiration and photosynthesis.

(2 marks)

- b) Soil erosion - the expanded soil dries out under the Sun;

(2 marks)

- c) Serious flooding - rainwater runs off the exposed soil rather than soaking in as before;

(2 marks)

- d) More carbon dioxide - the trees that used to remove the gas are gone.

(2 marks)

(Total = 8 marks)

Enzymes (Questions) *

1. **Fill in the missing words:**

Enzymes are biological **(i)**____. They **(ii)**____ the rate of **(iii)**____ reactions in all living things, and allow them to occur more easily. They occur in **(iv)**____ and **(v)**____ cells. Without them we would not be able to **(vi)**_____.

(Marks available: 3)

Enzymes (Answers)

Answer outline and marking scheme for question: 1

(i) catalysts

(ii) increase

(iii) chemical

(iv) plant / animal

(v) animal / plant

(vi) live / survive

Evolution (Questions)

1. Charles Darwin was famous for his "natural selection" theory. Jean Baptiste de Lamarck had a different idea - that plants and animals evolve features according to how much they use or need them.

What experiment / findings disproved Lamarck's idea?

(Marks available: 2)

2. Name 3 causes of extinction.

(Marks available: 3)

3. Give the main pro and con of a mutation in an organism.

(Marks available: 2)

Evolution (Answers)

Answer outline and marking scheme for question: 1

When mice that had their tails cut off, they still gave birth to baby mice with tails.

(Total = 2 marks)

Answer outline and marking scheme for question: 2

- A rapid environmental change to which they cannot adapt to (i.e. food / industry).
- A new threat (i.e. new predator / disease).
- Failure to compete successfully against new species.

(Total = 3 marks)

Answer outline and marking scheme for question: 3

Pro: Can give the organism a better chance of survival.

Con: Can give rise to things like inherited diseases.

(Total = 2 marks)

Fertilisation (Questions)

1. Fill in the missing words...

Most mutations are harmful. In developing ___(i)___ they cause ___(ii)___ development and may cause early ___(iii)___. In older tissue, they can cause cells to keep on ___(iv)___ uncontrollably. These cells develop into ___(v)___, spread into other parts of the body and so become ___(vi)___.

(Marks available: 6)

Fertilisation (Answers)

Answer outline and marking scheme for question: 1

(i) embryos;

(ii) abnormal;

(iii) death;

(iv) dividing;

(v) tumours;

(vi) cancerous.

(Total = 6 marks)

Genes and Genetics (Questions)

1. Name 4 animal characteristics that are not affected at all by the environment.

(Marks available: 4)

2. Which statement is the correct one - a or b?

a) Cytosine and Guanine join; Adenine and Thymine join.

Or..

b) Adenine and Guanine join; Cytosine and Thymine join.

(Marks available: 1)

3. Fill in the missing words...

Mitosis is the process used during **(i)** to make new cells within a **(ii)** or **(iii)**. It is also used during **(iv)** reproduction, in which an individual can **(v)** itself to produce identical offspring.

(Marks available: 5)

4. Fill in the missing words...

Meiosis is used to create the **(i)**, these are the **(ii)** or **(iii)** used in **(iv)** reproduction. The offspring produced during this kind of reproduction have **(v)** that are selected from those of the parents.

(Marks available: 5)

Genes and Genetics (Answers)

Answer outline and marking scheme for question: 1

- (i) eye colour;
- (ii) hair colour;
- (iii) inherited diseases;
- (iv) blood group.

(Total = 4 marks)

Answer outline and marking scheme for question: 2

a) is the correct statement.

(Total = 1 marks)

Answer outline and marking scheme for question: 3

- (i) growth;
- (ii) plant / animal;
- (iii) animal / plant;
- (iv) asexual;
- (v) clone.

(Total = 5 marks)

Answer outline and marking scheme for question: 4

- (i) gametes;
- (ii) sperm;
- (iii) eggs;
- (iv) sexual;
- (v) characteristics.

(Total = 5 marks)

Genetic Crosses (Questions)

1. **a)** What do you call an individual with 2 alleles the same?
b) What do you call an individual with 2 different alleles?

(Marks available: 2)

2. What does sickle cell anaemia do to red blood cells and why is this bad?

(Marks available: 2)

3. Apart from sickle cell anaemia, name 3 other inherited diseases.

(Marks available: 3)

Genetic Crosses (Answers)

Answer outline and marking scheme for question: 1

a) Homozygous.

b) Heterozygous.

(Total = 2 marks)

Answer outline and marking scheme for question: 2

The disease causes red blood cells to change from their usual round shape to become pointed.

It is bad because it means they get stuck in blood vessels and cannot pick up oxygen properly from the lungs.

(Total = 2 marks)

Answer outline and marking scheme for question: 3

Any 3 of the following:

(i) cystic fibrosis;

(ii) haemophilia;

(iii) huntingtons chorea;

(iv) downs syndrome.

(Total = 3 marks)

Heart and Circulation (Questions)

1. Fill in the missing words...

Blood fills the atria and the ___(i)___ and ___(ii)___ valves are closed. The atria gently ___(iii)___ and push their blood into the two ___(iv)___ nbsp;. These then start to contract, which closes the atrial valves and pushes the blood out through the ___(v)___ valves into the ___(vi)___ artery and the ___(vii)___ .

(Marks available: 7)

2. What is the function of the hepatic portal vein?

(Marks available: 2)

3. Name 4 of the substances found in plasma.

(Marks available: 4)

Heart and Circulation (Answers)

Answer outline and marking scheme for question: 1

(i) bicuspid / tricuspid

(ii) tricuspid / bicuspid

(iii) contract

(iv) ventricles

(v) semi-lunar

(vi) pulmonary

(vii) aorta

(Total = 7 marks)

Answer outline and marking scheme for question: 2

It carries blood to the liver.

Then the blood can leave the liver for the heart.

The hepatic portal system stops the blood system getting clogged up.

(Total = 2 marks)

Answer outline and marking scheme for question: 3

Any 4 of the following:

- water
- carbon dioxide
- antitoxins
- glucose
- urea
- amino acids
- antibodies
- hormones

(Total = 4 marks)

Homeostasis (Questions)

1. Fill in the missing words...

Why do we need homeostasis?

If there was not a constant ___(i)___ environment, our ___(ii)___ would not work properly. That would mean that nothing would operate properly and we would ___(iii)___.

(Marks available: 3)

2. Name 3 organs of the body that are involved in homeostasis and briefly explain what they do.

(Marks available: 6)

3. When there is too little water in the body, a sequence of events occurs. Fill in the missing words to complete the process:

Too little water in blood.

Detected by ___(i)___.

More ___(ii)___ released into blood by the ___(iii)___.

___(iv)___ reabsorbs more water.

Less ___(v)___ produced.

Blood water level not reduced further.

(Marks available: 5)

Homeostasis (Answers)

Answer outline and marking scheme for question: 1

(i) internal;

(ii) enzymes;

(iii) die.

(Total = 3 marks)

Answer outline and marking scheme for question: 2

Choose any 3 of the following, with a short summary of what they do...

Through the hypothalamus and pituitary glands the brain has a long-lasting and powerful effect on the body by involving hormones.

The hypothalamus monitors water, temperature and the level of carbon dioxide in the blood.

The pituitary gland secretes a number of hormones - a key one is ADH, which is important in regulating the water content of the body.

The liver helps to control glucose content of the body by storing it as glycogen. It is also involved in temperature regulation, acting as the body's furnace by increasing the rate of respiration when we are cold.

The lungs are involved by getting rid of carbon dioxide from the body.

The pancreas is involved in maintaining a constant amount of glucose in the body through the actions of glucagon and insulin.

The muscles of the body can help to maintain a stable body temperature as muscular activity and shivering help to generate heat.

The kidney is involved in controlling the amount of water in the body.

The skin is the largest organ and has a central role in maintaining a constant temperature.

(Total = 6 marks)

Answer outline and marking scheme for question: 3

(i) hypothalamus;

(ii) adh;

(iii) pituitary gland;

(iv) kidney;

(v) urine.

(Total = 5 marks)

Nerves and Hormones (Questions)

1. Read the following 3 definitions of 3 different types of neurones and label them...

a) Co-ordinate the response. Are link neurones in the central nervous system (CNS).

b) Carries impulses from receptors to the CNS.

c) Carries impulses from the CNS to the effector.

(Marks available: 3)

2. Fill in the missing words...

The **(i)** is picked up by a **(ii)**, which transmits an impulse to a **(iii)** neurone. This neurone passes the impulse to the **(iv)**, the central nervous system. The CNS co-ordinates the signal and transmits back a **(v)** via a **(vi)** neurone. The response is carried out by the **(vii)** organ, which is either a gland or a muscle.

(Marks available: 7)

3. **a)** What gland controls the volume of water in the body?

b) What hormone does it secrete to be able to do this?

(Marks available: 2)

4. What is diabetes?

(Marks available: 1)

Nerves and Hormones (Answers)

Answer outline and marking scheme for question: 1

- a) Relay neurones
- b) Sensory neurones
- c) Motor neurones

(Total = 3 marks)

Answer outline and marking scheme for question: 2

- (i) stimulus
- (ii) receptor
- (iii) sensory
- (iv) co-ordinator
- (v) response
- (vi) motor
- (vii) effector

(Total = 7 marks)

Answer outline and marking scheme for question: 3

- a) The pituitary gland.
- b) It secretes anti-diuretic hormone (ADH).

(Total = 2 marks)

Answer outline and marking scheme for question: 4

It is a disease in which the pancreas cannot produce enough insulin.

(Total = 1 marks)

Nutrition (Questions)

1. What main substances (i.e. proteins / vitamins / etc) are the following foods rich in?

(i) beans

(ii) rice

(iii) sunflower oil

(iv) watermelon

(v) citrus fruits

(Marks available: 5)

2. What disease is contracted from a deficiency in...

a) Vitamin C

b) Vitamin D

c) Iron

(Marks available: 3)

3. **Complete the following table:**

Starting Food:	Type of Enzyme Used:	Products Made:
-----------------------	-----------------------------	-----------------------

Carbohydrates(starch)	___(i)___	___(iv)___
-----------------------	-----------	------------

Proteins	___(ii)___	___(v)___
----------	------------	-----------

Fats	___(iii)___	___(vi)___ ___(vii)___
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(Marks available: 7)

4. What are the 4 different types of human teeth?

(Marks available: 4)

5. Fill in the missing words...

The tongue helps to form the food into a small, moist ball called a ___(i)___, which can be easily swallowed.

This is then squeezed down the ___(ii)___ by wavelike contractions of the surrounding muscle. This is called ___(iii)___.

(Marks available: 3)

Nutrition (Answers)

Answer outline and marking scheme for question: 1

- (i) protein
- (ii) carbohydrate
- (iii) fat
- (iv) water
- (v) vitamins

(Total = 5 marks)

Answer outline and marking scheme for question: 2

- a) Scurvy
- b) Rickets
- c) Anaemia

(Total = 3 marks)

Answer outline and marking scheme for question: 3

Starting Food:	Type of Enzyme Used:	Products Made:
Carbohydrates(starch)	Carbohydrase	Simple Sugars
Proteins	Protease	Amino Acids
Fats	Lipase	Fatty Acids and Glycerol

(Total = 7 marks)

Answer outline and marking scheme for question: 4

- Incisors
- Canines
- Pre-molars
- Molars

(Total = 4 marks)

Answer outline and marking scheme for question: 5

(i) bolus

(ii) oesophagus

(iii) peristalsis

(Total = 3 marks)

Photosynthesis (Questions) *

1. Why do plants store some of the sugar they make as starch?

(Marks available: 2)

2. What 4 things might affect the rate of photosynthesis?

(Marks available: 4)

3. How do plants stop themselves drying out?

(Marks available: 2)

Photosynthesis (Answers)

Answer outline and marking scheme for question: 1

Plants could use starch or glucose. Starch is insoluble, while glucose is soluble.

This means that if starch is used, less water is required to keep its food stored.

(Total = 2 marks)

Answer outline and marking scheme for question: 2

Amounts of...

- water
- carbon dioxide
- sunlight
- temperature

(Total = 4 marks)

Answer outline and marking scheme for question: 3

They close their stomata.

The guard cells lose water and become flaccid.

(Total = 2 marks)

Plant Growth (Questions)

1. Fill in the missing words...

Water moves from the soil into the roots by ___(i)___ and then flows steadily up the ___(ii)___. As water is lost from the leaf by ___(iii)___ more water is drawn up through the ___(iv)___ to replace it. The roots have root ___(v)___ to increase their ___(vi)___ and so allows more water to be absorbed.

(Marks available: 6)

2. There are 3 main nutrients that are good for plants - nitrates, phosphates and potassium.

What are the deficiency symptoms of the 3 nutrients?

(Marks available: 6)

Plant Growth (Answers)

Answer outline and marking scheme for question: 1

(i) osmosis;

(ii) xylem;

(iii) transpiration;

(iv) xylem;

(v) hairs;

(vi) surface area.

(Total = 6 marks)

Answer outline and marking scheme for question: 2

Nitrates: Stunted growth and yellow, older leaves;

(2 marks)

Phosphates: Poor roots and purple, younger leaves;

(2 marks)

Potassium: Yellowing leaves with dead spots.

(2 marks)

(Total = 6 marks)

Respiration (Questions)

1. **What is the:**

a) definition of respiration?

b) equation of respiration?

(Marks available: 2)

2. Which 2 organs of the body use glucose as fuel?

(Marks available: 2)

3. The intercostal muscles are very important in the process of breathing.

a) Where are they located?

b) What do they do?

(Marks available: 2)

4. When we breathe in air, it enters the lungs down the **(i)**, which branches into the right and left **(ii)**. Each **(iii)** then divides further into **(iv)**. After about 20 branchings, you reach the **(v)**.

(Marks available: 5)

Respiration (Answers)

Answer outline and marking scheme for question: 1

a) The process of releasing energy from food.

(1 mark)

b) glucose + oxygen -> carbon dioxide + water + energy.

(1 mark)

(Total = 2 marks)

Answer outline and marking scheme for question: 2

- The heart
- The brain

(Total = 2 marks)

Answer outline and marking scheme for question: 3

a) Small muscles between the ribs.

(1 mark)

b) They pull the ribcage up and outwards.

(1 mark)

(Total = 2 marks)

Answer outline and marking scheme for question: 4

(i) trachea;

(ii) bronchi;

(iii) bronchus;

(iv) bronchioles;

(v) alveoli.

(Total = 5 marks)

