AQA GCSE BIOLOGY (HIGHER) · 8461

BIOLOGY



MARK SCHEME

4.2.1 PRINCIPLES OF ORGANISATION

SCORE	PERCENTAGE
/62	%

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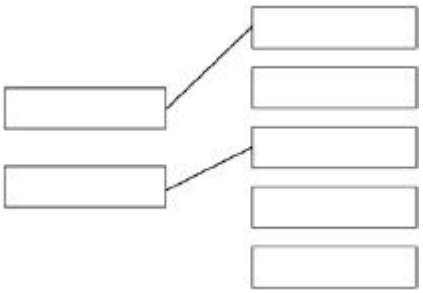
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Q1.

(a)



additional line from a level of organisation negates the mark for that level of organisation

2

(b) palisade mesophyll

1

(c) $\frac{50}{8}$

1

6 / 6.25 / 6.3 (micrometres)

1

*an answer of 6 / 6.25 / 6.3 scores **2** marks*

(d) they have no chloroplasts / chlorophyll

allow they are underground

allow they don't get (access to) light

allow (because) photosynthesis needs light

allow they can't absorb light

ignore 'sun'

ignore 'it is dark'

1

(e) differentiation

1

(f) to protect endangered plants from extinction

1

(g) plants can be produced quickly

1

(h) any **one** from:

- glucose / sugars / starch
- amino acids / protein
- hormones

  allow named hormones e.g. auxin
- ions / minerals

  allow magnesium / nitrate
- vitamins

  allow named vitamins e.g. vitamin B

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- water

  allow H_2O / H2O

  ignore oxygen / carbon dioxide / agar / nutrients / fertiliser

1

[10]

Q2.

(a) any **two** from:

allow proteins / hormones / antibodies / vitamins / minerals / ions / fatty acids / glycerol

- carbon dioxide
- water
- glucose
- amino acids

  ignore sugar / enzymes / nutrients / waste
- lactic acid

2

(b) more haemoglobin

***max 2** marks if 'more' is not given*

1

(therefore) more oxygen can be carried / transported

1

(for) more (aerobic) respiration of muscle (cells)
or
more energy released for muscle (cells)

allow less anaerobic respiration / lactic acid / oxygen debt / fatigue in muscle (cells)
i.e. addition of 'debt'

*do **not** accept energy produced*

1

(c) pulmonary artery

1

vena cava

1

(d) B

1

(e) any **three** from:

- arteries have a thick**er** layer of muscle (tissue) **or** veins have a thinn**er** layer of muscle (tissue)*
- arteries have a thick**er** layer of elastic tissue **or** veins have a thinn**er** layer of elastic tissue*

if neither marking points 1 or 2 awarded, allow arteries have a thick wall **and veins have a thin wall*
or
*arteries have a thick**er** wall or veins have a thinn**er** wall for **1** mark*

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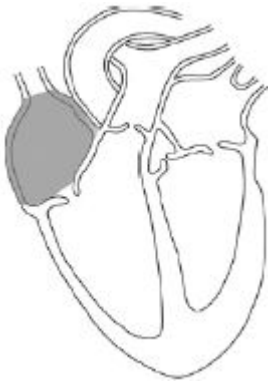
*do **not** accept 'cell wall'*

- arteries have a narrow**er** lumen **or** veins have a wid**er** lumen
  allow descriptions of 'lumen'

- arteries do not have valves **and** veins have valves
  *allow **only** veins have valves*

3

(f) allow an X drawn anywhere in grey shaded area below:



if a large X is drawn, award the mark if the intersection touches the grey area

if a label line is used, award marks if the end of the label line touches the grey area

allow label 'pacemaker'

ignore label 'right atrium'

1

(g) an irregular heart beat

allow arrhythmia
allow fibrillation

ignore heart failure

*do **not** accept cardiovascular disease / heart murmur*

1

[13]

Q3.

(a) (**A**) bronchus

allow bronchi

allow bronchiole

1

(**B**) trachea

allow windpipe

1

(**C**) alveolus

allow alveoli

ignore air sac

1

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(b) circulatory system

1

(c) **Q**

1

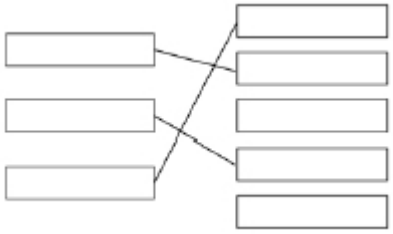
(d) guard cell

1

(e) a group of cells with a similar structure / function

1

(f)



1 *mark for each correct line*
extra line from a tissue negates the mark for that tissue

3

[10]

Q4.

(a) tissue → organ → organ system
*one right for **1** mark*
*three right for **2** marks*

2

(b) **Epithelial tissue** → covers the outside and the inside of the stomach
more than one line from a tissue = no mark

1

Glandular tissue → produces digestive juices

1

Muscular tissue → allows food to be churned around the stomach

1

(c) (i) light
ignore dark

1

(ii) moving (to the dark)

1

(iii) any **two** from:

- use more woodlice
- repeat the experiment
- run for a longer time

2

[9]

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Q5.

(a)

Structure	Organ	Organ system	Tissue
Stomach	✓		
Cells lining the stomach			✓
Mouth, oesophagus, stomach, liver, pancreas, small and large intestine		✓	

all 3 correct = 2 marks
2 correct = 1 mark
1 or 0 correct = 0 marks

2

(b) (i) diffusion

allow phonetic spelling

1

(ii) glucose

1

(iii) mitochondria

1

[5]

Q6.

(a) (i) xylem

1

(ii) water

1

minerals / ions / named example(s)

ignore nutrients

1

(b) (i) movement of (dissolved) sugar

allow additional substances, eg amino acids / correct named sugar (allow sucrose / glucose)

allow nutrients / substances / food molecules if sufficiently qualified

ignore food alone

1

(ii) sugars are made in the leaves

1

so they need to be moved to other parts of the plant for respiration / growth / storage

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1

(c) (i) mitochondria

1

(ii) for movement of minerals / ions

Do not accept 'water'

1

against their concentration gradient

1

[9]

Q7.

(a) (i) A = (cell) membrane

1

B = cytoplasm

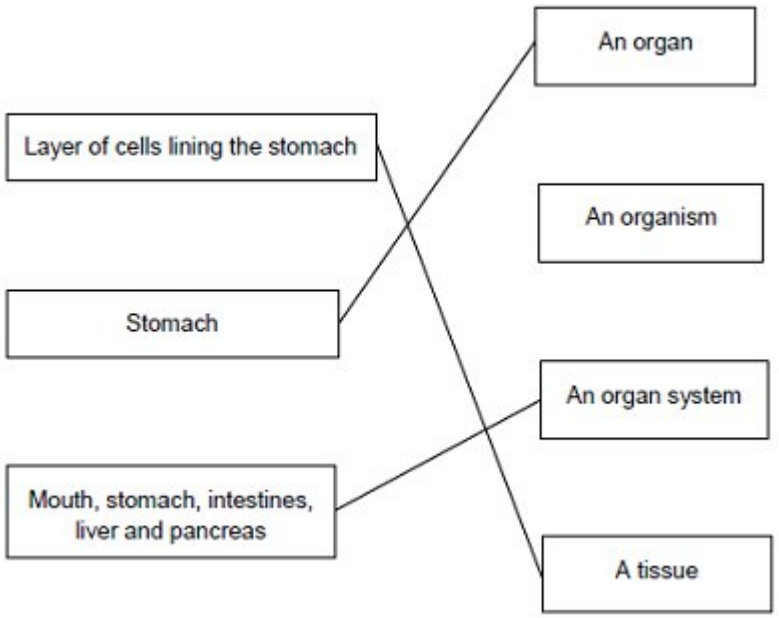
*do **not** accept cytoplast*

1

(ii) To control the activities of the cell

1

(b)



extra lines cancel

3

[6]

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