Topica Past Papers IGCSE Edexcel

BIOLOGY

PAPER 1B, 1BR 2015 - winter 2019

1 - (4BI0-S 2015-Paper 1B-Q1) - *LIFE PROCESSES*

Living organisms share some basic characteristics.

Draw a straight line from each characteristic to its correct description.

The first has been done for you.

(4)

Characteristic	**Description**
sensitivity	production of new organisms
respiration	respond to the surroundings
excretion	taking in of food
reproduction	increase in number of cells
growth	release of energy in cells
nutrition	removal of metabolic waste

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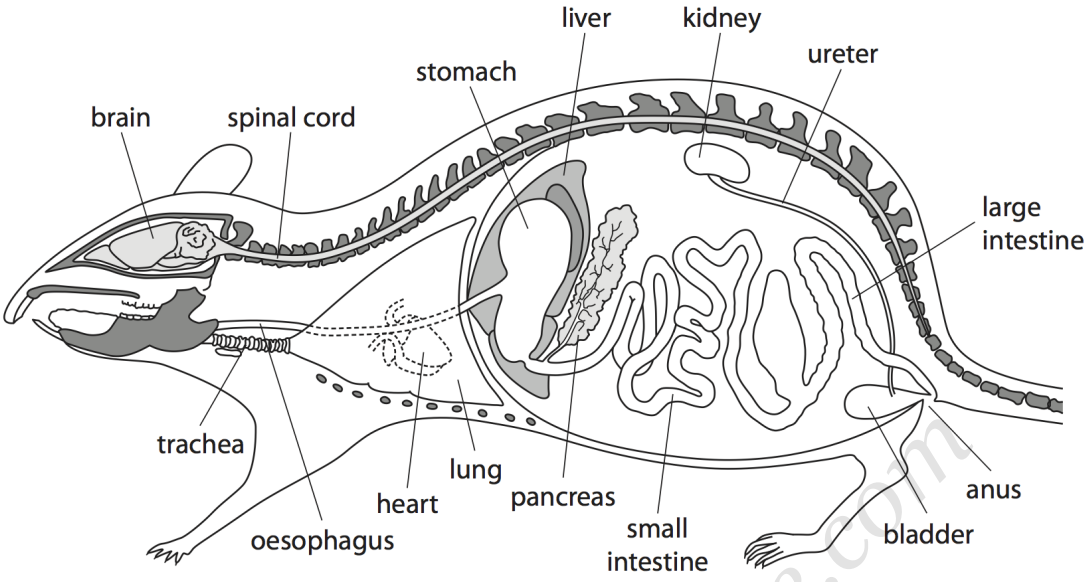
2 - (4BI0-S 2015-Paper 1B-Q2) - *LIFE PROCESSES*

The diagram shows a section through a rat. Some of the rat's organs have been labelled.



(a) (i) What is meant by the term **organ**?

(1)

.....

.....

(ii) Name the organ labelled in the diagram that is part of the circulation system.

(1)

.....

(iii) Name three other systems shown in the diagram.

(3)

1 .....

2 .....

3 .....

(iv) Name a system that is **not** shown in the diagram.

(1)

.....

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(b) The table lists several processes that take place in the organs of a rat.

Complete the table by naming the correct organ for each process.

(5)

Process	Organ
ultrafiltration	
ventilation	
insulin secretion	
hydrochloric acid secretion	
bile production	

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3 - (4BI0-S 2015-Paper 1B-Q12) - *LIFE PROCESSES*

Eating garlic is thought to reduce the chance of being bitten by insects, such as mosquitoes.

Design an investigation to find out if people who have eaten garlic are less likely to attract mosquitoes than people who have not eaten garlic.

Your answer should include experimental details and be written in full sentences.

(6)

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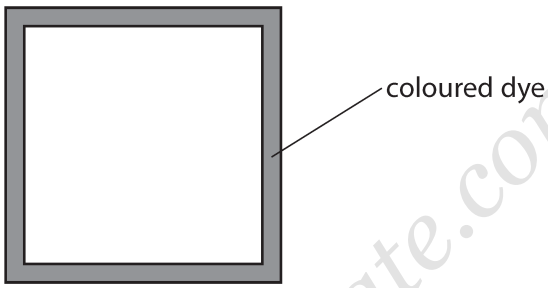
4 - (4BI0-S 2016-Paper 1BR-Q9) - *LIFE PROCESSES, BLOOD AND CIRCULATION*

A student carries out an experiment to investigate the factors affecting the rate of diffusion.

(a) In her first experiment

- she makes three agar jelly cubes, one with sides of 4.0 cm, one with sides of 2.0 cm and one with sides of 1.0 cm
- she covers each cube in a solution of a coloured dye for three minutes
- she then cuts the cubes to see how far the dye has diffused

The diagram shows a cross-section through the largest cube after three minutes.



(i) Describe what is meant by the term **diffusion**.

(1)

.....

.....

.....

(ii) Measure the distance that the dye has diffused into the large cube.

(1)

distance = ... mm

(iii) Complete the diagram below to show how far the dye will have diffused in the smallest cube after three minutes.

(1)

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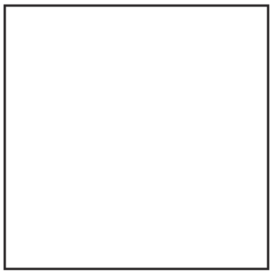
(b) The student then carries out a second experiment but this time she leaves the cubes in the dye for six minutes.

Draw the results you would expect to see when the largest cube is cut open after six minutes.

(1)



(c) Other factors may affect the rate of diffusion of the dye.

Explain two factors that the student should keep constant in her investigation.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

(d) Explain how the results of the student's investigation support the idea that large organisms need a circulation system.

(3)

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ANSWERS

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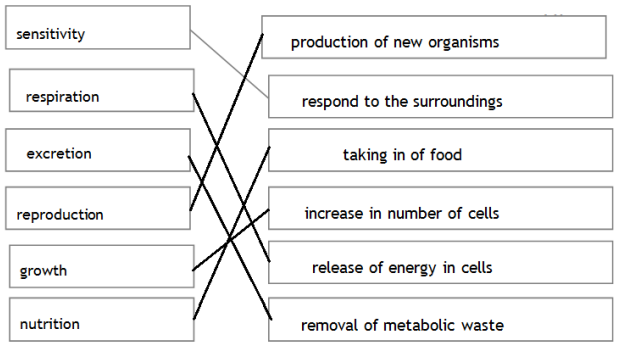
1 - (4BI0-S 2015-Paper 1B-Q1) - *LIFE PROCESSES*

		5 = 4 4 = 3 3 or 2 = 2 1 = 1	4

2 - (4BI0-S 2015-Paper 1B-Q2) - *LIFE PROCESSES*

(a)(i)	tissue(s) that carry out (same) function / <u>different</u> cell types that carry out (same) function / eq;		1
(ii)	heart;		1
(iii)	1. nervous / CNS; 2. breathing / respiratory / ventilation; 3. digestive; 4. excretory / urinary; 5. skeletal; 6. endocrine / hormonal;		3 max
(iv)	reproductive / immune / lymphatic;		1

(b)

Process	Name of organ
ultrafiltration	kidney;
ventilation	lung;
secretion of insulin	pancreas;
secretion of hydrochloric acid	stomach;
bile production	liver;

5

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3 - (4BI0-S 2015-Paper 1B-Q12) - *LIFE PROCESSES*

	C garlic and no garlic / different amount / mass of garlic; O same age / species / same gender of <u>mosquito</u> / eq; R lots of people / repeat / eq; M1 count number of mosquito bites / landing / eq; M2 per hour / day / same time period stated; S1 and S2 same light / same temperature / same time of year / same diet of people / same gender or age or mass of people / same clothing or exposure of skin / same number of mosquitoes / eq;;	Ignore location / place / room/ environment	6 max

4 - (4BI0-S 2016-Paper 1BR-Q9) - *LIFE PROCESSES, BLOOD AND CIRCULATION*

(a) (i)	movement of particles/ions/molecules/gas from a high concentration to a low concentration / down a concentration gradient;	ignore substances / liquid ignore along / across	1
(ii)	3 mm;		1
(iii)	must be clear in middle and not drawn outside cube;	allow if border not shaded	1
(b)	cube shows more penetration of dye at any one edge and clear in middle;	allow if uneven allow if border not shaded	1
(c)	1. temperature (increased); 2. particles have more (kinetic) energy / move faster / more movement / eq; OR 3. concentration of dye (increased); 4. increased gradient / more particles / eq; OR 5. concentration of agar (increased); 6. reduces speed of particle movement / eq;	allow converse ignore more collisions	maximum of two factors Max 4

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(d)	1. dye does not reach middle of cube / takes longer to reach middle of cube / reaches lower proportion; 2. large organisms / large cubes have small SA:VOL; 3. (in large organisms) <u>diffusion</u> is slow / <u>diffusion</u> takes too long / <u>diffusion</u> is insufficient / <u>diffusion</u> is affected by distance / eq; 4. need to get <u>oxygen</u> / <u>glucose</u> to cells / all of the body;	allow converse	Max 3

5 - (4BI0-W 2018-Paper 1B-Q12) - *LIFE PROCESSES, FOOD AND DIGESTION*

(a)

Example	Process
carbon dioxide moving through stomata into a leaf	diffusion / gas exchange;
nitrate ions moving into a plant root hair cell against a concentration gradient	active transport / active uptake;
water moving from a collecting duct of the kidney into blood plasma	osmosis / reabsorption;

3

(b)

1. villi / microvilli increase surface area;

2. thin walls / one cell thick provide short diffusion distance / faster diffusion / more diffusion / eq;

3. capillaries to absorb glucose / amino acids / blood supply to absorb glucose / amino acids;

4. capillaries maintain diffusion gradient / maintain concentration gradient / blood supply maintain diffusion gradient / maintain concentration gradient / eq;

5. lacteals absorb fatty acids and glycerol;

6. long so more diffusion / absorption / increases surface area;

max 4

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