1.2 Organisation: 30-minute Pack

AQA 8461 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The blood is made up of plasma, red blood cells, white blood cells and platelets. Give one role of plasma.

(Total for Question 1 is 1 mark)

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2 A biology student is describing the structures found in a typical human cheek cell (an animal cell) as seen under a light microscope.

(a) State the function of the nucleus. **(1)**

(b) State the function of the mitochondria. **(1)**

(c) State the function of the cell membrane. **(1)**

(d) State the function of the ribosomes. **(1)**

(Total for Question 2 is 4 marks)

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3 Name the blood vessels that carry blood away from the heart and name the blood vessels that carry blood back to the heart. Give one example in each case.

(a) Name the vessels that carry blood away from the heart and give an example. **(2)**

(b) Name the vessels that carry blood back to the heart and give an example. **(1)**

(Total for Question 3 is 3 marks)

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4 Cells become specialised (differentiated) to carry out a particular function.

(a) Explain two ways in which a sperm cell is adapted to its function of fertilising an egg cell. **(2)**

(b) Explain how a root hair cell is adapted to absorb water and mineral ions efficiently. **(1)**

(c) Explain how a red blood cell is adapted to carry oxygen efficiently. **(1)**

(d) Define the term 'differentiation'. **(1)**

(Total for Question 4 is 5 marks)

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5 A student measures the mass of a sealed leaf before and after a 24 hour period in the dark. The mass decreased from 4.80 g to 4.20 g. Calculate the percentage decrease in mass.
Show your working.

(Total for Question 5 is 3 marks)

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6 A student investigates how exercise affects breathing rate. They count breaths for 60 seconds at rest and after light exercise. At rest the student counts 14 breaths in 60 s. After light exercise they count 28 breaths in 60 s.

(a) Calculate the difference in breaths per minute. **(2)**

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(b) State one reason why breathing rate increases after exercise. **(2)**

.....

.....

(Total for Question 6 is 4 marks)

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7 A student carried out the required practical to test an unknown food sample for the presence of different nutrients.

(a) Describe the test, and the positive result, for the presence of reducing sugars. **(2)**

.....

.....

(b) Describe the test, and the positive result, for the presence of starch. **(2)**

.....

.....

(c) Describe the test, and the positive result, for the presence of protein. **(1)**

.....

(d) The student added ethanol, then water, to a sample of the food. A white/milky emulsion formed. State what this result indicates about the food sample. **(1)**

(Total for Question 7 is 6 marks)

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Mark scheme · 1.2 Organisation: 30-minute Pack

Question 1

transports dissolved substances such as glucose, amino acids, hormones, or carbon dioxide, oe **B1**

Answer: Plasma transports dissolved substances such as glucose, amino acids, hormones or carbon dioxide.

Question 2

(a) controls the activity of the cell / contains genetic material (DNA) organised as chromosomes (oe) **B1**

(a) Answer: Controls the cell's activities and contains the genetic material.

(b) site of (aerobic) respiration, releasing energy for the cell (oe) **B1**

(b) Answer: Site of aerobic respiration, releasing energy.

(c) controls what substances enter and leave the cell (oe) **B1**

(c) Answer: Controls the movement of substances into and out of the cell.

(d) site of protein synthesis (oe) **B1**

(d) Answer: Where proteins are made (protein synthesis).

Question 3

(a) arteries cao **B1**

(a) example: aorta or pulmonary artery, oe **B1**

(a) Answer: Arteries; example: aorta (or pulmonary artery).

(b) veins, example: vena cava or pulmonary vein, oe **B1**

(b) Answer: Veins; example: vena cava (or pulmonary vein).

Question 4

(a) long tail (flagellum) so the cell can swim/move towards the egg cell (oe) **B1**

(a) many mitochondria in the mid-section to release energy (from respiration) for swimming (oe) **B1**

(a) Answer: Long flagellum for swimming; many mitochondria to provide energy for movement.

(b) long hair-like extension gives a large surface area (to volume ratio) for absorption (oe) **B1**

(b) Answer: It has a long extension giving a large surface area for absorption.

(c) biconcave disc shape gives a large surface area for gas exchange OR no nucleus, leaving more room for haemoglobin (oe, any one) **B1**

(c) Answer: Biconcave shape (large surface area) or lack of nucleus (more room for haemoglobin).

(d) the process by which a cell changes/becomes specialised to carry out a particular function (oe) **B1**

(d) Answer: The process in which a cell changes to become specialised for its function.

Question 5

method: calculates change in mass 4.80 - 4.20 = 0.60 g or shows correct substitution for percentage change **M1**

method: divides change by original mass: 0.60 / 4.80 **M1**

12.5% cao **A1**

Answer: 12.5%

Question 6

(a) method: subtracts 14 from 28 or shows correct subtraction 28 - 14 **M1**

(a) 14 breaths per minute cao **A1**

(a) Answer: 14 breaths per minute

(b) to take in more oxygen for increased respiration or to remove more carbon dioxide produced by increased respiration, oe **B1**

(b) example linking to muscle activity: muscles need more energy so breathing rate increases to supply oxygen, oe **B1**

(b) Answer: Breathing rate increases to take in more oxygen and remove more carbon dioxide because muscles need more energy during exercise.

Question 7

(a) add Benedict's solution and heat in a water bath (oe) **B1**

(a) positive result: colour changes from blue to (brick-red/orange) precipitate (oe) **B1**

(a) Answer: Add Benedict's solution and heat; a positive test turns the solution from blue to brick-red.

(b) add iodine solution (oe) **B1**

(b) positive result: colour changes from orange-brown to blue-black (oe) **B1**

(b) Answer: Add iodine solution; a positive test turns the solution from orange-brown to blue-black.

(c) biuret test: add sodium hydroxide solution then dilute copper sulfate solution; positive result = colour changes from blue to purple/lilac (oe) **B1**

(c) Answer: Biuret test: add sodium hydroxide then copper sulfate solution; positive test turns purple/lilac.

(d) the food contains lipid/fat **B1**

(d) Answer: The food contains lipid (fat).

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