3.1 Biology: Life Processes: 2-hour Pack

ISEB CE 13+ Science (Biology) · Calculator allowed · about 120 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 What is the life process by which an organism removes toxic substances it has made through respiration and digestion?

(1)

2 Name the enzyme produced in the pancreas that breaks down fats into fatty acids.

(1)

3 The human gas exchange system (the lungs) is well adapted for efficient gas exchange between the air and the blood. Describe the features of the lungs that make gas exchange efficient, and explain how each feature helps to increase the rate of gas exchange.

(6)

4 Name the sugar that is a product of starch digestion and is used by cells for aerobic respiration.

(1)

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5 Name the component of blood that carries glucose and hormones around the body.

.....

(1)

---

6 A student tested enzyme action at 50°C and found the starch was fully broken down in 50 seconds. Use rate = 1000 / time to calculate the rate of reaction at 50°C.

(1)

---

7 Name the enzyme produced in the mouth that breaks down starch into maltose.

.....

(1)

---

8 Name the nutrition type used by organisms that produce their own food from inorganic substances.

.....

(1)

---

9 When you step on a sharp object, you lift your foot very quickly before you feel pain. Name this fast, automatic response.

.....

(1)

---

10 Name the waste product that diffuses out of respiring cells and is exhaled by the lungs.

.....

(1)

---

11 Name the food group that is most important for making cell membranes and hormones.

.....

.....

(1)

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12 Name the blood component produced in bone marrow that has no nucleus and helps to seal wounds.

.....

(1)

---

13 Name the type of fast, involuntary response triggered when the doctor taps your knee with a hammer.

.....

(1)

---

14 Which one of these is NOT a life process?

- ☐ A) Reproduction
- ☐ B) Synthesis
- ☐ C) Excretion
- ☐ D) Movement

---

15 Name the form of reproduction by which a strawberry plant produces runners that develop into new plants.

.....

(1)

---

16 Which organelle has a double membrane and cristae for aerobic respiration?

- ☐ A) Mitochondrion
- ☐ B) Nucleus
- ☐ C) Chloroplast
- ☐ D) Ribosome

---

17 Name the type of reproduction that produces genetically different offspring from two parents.

.....

.....

.....

(1)

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18 When a sprinter runs at maximum speed, oxygen cannot reach the muscles fast enough. Name the acid that builds up as a result.

(1)

19 A student investigated how temperature affects the enzyme protease. At each temperature, she mixed protease solution with milk protein and measured how long it took to break down the protein completely. Temperature (°C): 20, 30, 40, 50. Time (minutes): 8, 4, 2, 4. Calculate the rate of reaction at 40°C, using rate = 1000 / time taken (in seconds).

(1)

20 Name the enzyme that is released from the pancreas and continues starch digestion in the small intestine.

(1)

21 Name the enzyme that causes starch to test negative with iodine solution.

(1)

22 A teenager needs 2300 kcal per day. She consumes 2150 kcal in total. Calculate the difference between her energy requirement and her energy intake, stating whether this is a surplus or a deficit.

(1)

23 Name the component of blood that recognises and destroys harmful bacteria.

(1)

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24 Name the life process that describes using food for energy and growth.

(1)

25 Which organelle is the site of photosynthesis in plant cells?

- [ ] A) Ribosome
- [ ] B) Nucleus
- [ ] C) Chloroplast
- [ ] D) Mitochondrion

26 A 13-year-old pupil eats a breakfast of 420 kcal, a snack of 150 kcal, a lunch of 680 kcal and a dinner of 780 kcal. Calculate his total energy intake for the day.

(1)

27 A teenage girl's daily energy need is 2250 kcal. She eats a total of 2050 kcal. Calculate the difference and state whether her energy balance shows a surplus or a deficit.

(1)

28 Name the type of reproduction that produces offspring identical to the single parent organism.

(1)

29 Which vessel is the main artery leaving the heart?

- [ ] A) Subclavian artery
- [ ] B) Pulmonary artery
- [ ] C) Vena cava
- [ ] D) Aorta

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30 Name the component of blood that releases the chemical thrombin to start blood clotting.

(1)

31 Which of these is a life process that occurs in all living organisms?

- ☐ A) Thinking
- ☐ B) Growth
- ☐ C) Flying
- ☐ D) Swimming

32 A food sample is tested for a reducing sugar such as glucose. What is the positive result?

- ☐ A) iodine solution turns blue-black
- ☐ B) Benedict's solution turns orange-red when heated
- ☐ C) mixing with ethanol, then water, gives a cloudy white emulsion
- ☐ D) universal indicator turns green
- ☐ E) damp litmus paper turns red

33 Name the component of blood that repairs damage and prevents further blood loss.

(1)

34 Name the component of blood that carries nutrients such as glucose around the body.

(1)

35 Name the organs that selectively reabsorb useful substances and form urine from the blood filtrate.

(1)

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36 Name the tiny blood vessels with walls one cell thick where gases diffuse between blood and body cells.

(1)

37 A 13-year-old pupil eats a breakfast of 480 kcal, a snack of 200 kcal, a lunch of 750 kcal and a dinner of 720 kcal. Calculate her total energy intake for the day.

(1)

38 Name the system that carries messages from receptors to the brain and from the brain to effectors.

(1)

39 Name the organ that deaminates amino acids to produce glucose and releases urea into the bloodstream.

(1)

40 Name the organ that stores excess glucose in the form of glycogen.

(1)

41 Name the blood vessels where waste products from the cells enter the blood.

(1)

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42 Which gas do plants release during photosynthesis?

- [ ] A) argon
- [ ] B) hydrogen
- [ ] C) carbon dioxide
- [ ] D) nitrogen
- [ ] E) oxygen

---

43 Name the vessels formed where arterioles branch into a network of microscopic tubes.

(1)

---

44 Which blood vessel carries oxygenated blood from the lungs to the heart?

- [ ] A) Pulmonary artery
- [ ] B) Pulmonary vein
- [ ] C) Aorta
- [ ] D) Vena cava

---

45 During intense anaerobic exercise, name the organic acid that accumulates in muscles and causes fatigue.

(1)

---

46 When yeast cells respire without enough oxygen, they produce ethanol. Name the other substance produced alongside ethanol in anaerobic respiration in plants and yeast.

(1)

---

47 A 13-year-old pupil requires 2250 kcal daily. She consumes breakfast with 570 kcal, a snack with 190 kcal, lunch with 760 kcal and dinner with 700 kcal. Calculate the difference between requirement and intake, and state whether this is a surplus or deficit.

(1)

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48 Which of these foods is a good source of vitamin C?

- [ ] A) oranges
- [ ] B) cod
- [ ] C) lard
- [ ] D) potatoes
- [ ] E) sunflower oil

---

49 A food sample is tested for starch. What is the positive result?

- [ ] A) mixing with ethanol, then water, gives a cloudy white emulsion
- [ ] B) limewater turns cloudy
- [ ] C) iodine solution turns blue-black
- [ ] D) damp litmus paper turns red
- [ ] E) a lit splint makes a squeaky pop

---

50 What is the green pigment in leaves called?

- [ ] A) haemoglobin
- [ ] B) melanin
- [ ] C) keratin
- [ ] D) chlorophyll
- [ ] E) cellulose

---

51 Which of these foods is NOT a good source of protein?

- [ ] A) blackcurrants
- [ ] B) tofu
- [ ] C) chicken
- [ ] D) beef
- [ ] E) cod

---

52 A food sample is tested for fat. What is the positive result?

- [ ] A) biuret reagent turns purple
- [ ] B) mixing with ethanol, then water, gives a cloudy white emulsion
- [ ] C) limewater turns cloudy
- [ ] D) iodine solution turns blue-black
- [ ] E) universal indicator turns green

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53 Which gas do leaves take in for photosynthesis?

- ☐ A) oxygen
- ☐ B) argon
- ☐ C) nitrogen
- ☐ D) hydrogen
- ☐ E) carbon dioxide

---

54 Name the hexose sugar produced when starch is fully digested in the alimentary canal.

(1)

---

55 Which of these foods is NOT a good source of carbohydrate?

- ☐ A) potatoes
- ☐ B) rice
- ☐ C) chicken
- ☐ D) pasta
- ☐ E) sugar

---

56 Which nutrient is shown by this result: mixing with ethanol, then water, gives a cloudy white emulsion?

- ☐ A) a reducing sugar such as glucose
- ☐ B) calcium
- ☐ C) vitamin C
- ☐ D) fat
- ☐ E) protein

---

57 Name the body system that detects light using the eyes and processes visual information in the brain.

(1)

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58 Which of these foods is a good source of protein?

- ☐ A) beef
- ☐ B) rice
- ☐ C) pasta
- ☐ D) sunflower oil
- ☐ E) oranges

---

59 Which nutrient is shown by this result: Benedict's solution turns orange-red when heated?

- ☐ A) fibre
- ☐ B) a reducing sugar such as glucose
- ☐ C) calcium
- ☐ D) protein
- ☐ E) starch

---

60 What is the growth of a seed into a new plant called?

- ☐ A) fertilisation
- ☐ B) respiration
- ☐ C) photosynthesis
- ☐ D) pollination
- ☐ E) germination

---

61 Name the tissue that contains fibres made of protein filaments that slide past each other to produce contraction.

(1)

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62 A plant cell contains a cell wall, a large permanent vacuole, chloroplasts, a cell membrane, cytoplasm and a nucleus. An animal cell contains a cell membrane, cytoplasm, a nucleus and mitochondria, but not the other three structures.

(a) Name two structures found in a plant cell but not in an animal cell. **(2)**

(b) State the function of the cell wall. **(1)**

(c) State the function of the chloroplast. **(1)**

63 Which of these foods is a good source of vitamin C?

- ☐ A) kiwi fruit
- ☐ B) butter
- ☐ C) pasta
- ☐ D) cod
- ☐ E) potatoes

64 Which sugar is made in photosynthesis?

- ☐ A) lactose
- ☐ B) glucose
- ☐ C) maltose
- ☐ D) protein
- ☐ E) cellulose

65 A temperature investigation shows amylase breaking down starch in 25 seconds at 40°C. Use the formula rate = 1000 / time taken (in seconds) to calculate the rate at this temperature.

(1)

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66 Which of these foods is a good source of protein?

- ☐ A) oranges
- ☐ B) strawberries
- ☐ C) tofu
- ☐ D) blackcurrants
- ☐ E) potatoes

---

67 Which nutrient is shown by this result: biuret reagent turns purple?

- ☐ A) vitamin C
- ☐ B) fibre
- ☐ C) starch
- ☐ D) calcium
- ☐ E) protein

---

68 What is the transfer of pollen from an anther to a stigma called?

- ☐ A) pollination
- ☐ B) photosynthesis
- ☐ C) respiration
- ☐ D) fertilisation
- ☐ E) germination

---

69 Name the type of reproduction where spores from one parent grow into new organisms without genetic recombination.

(1)

---

70 Which of these foods is NOT a good source of fat?

- ☐ A) lard
- ☐ B) oranges
- ☐ C) olive oil
- ☐ D) butter
- ☐ E) sunflower oil

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71 Sensitivity is the life process that allows an organism to detect and respond to changes in its surroundings.

(a) Define sensitivity as a life process. **(1)**

(b) Name the organ system that carries messages as electrical impulses around the body. **(1)**

(c) A pupil accidentally touches a hot object and pulls their hand away very quickly, before feeling any pain. Name this type of fast, automatic response. **(1)**

(d) Put these structures in the correct order for a reflex arc: effector, receptor, relay neurone, motor neurone, sensory neurone. **(2)**

72 Which of these foods is a good source of carbohydrate?

- ☐ A) blackcurrants
- ☐ B) lemons
- ☐ C) pasta
- ☐ D) chicken
- ☐ E) sunflower oil

73 What do guard cells control?

- ☐ A) the speed of water in the xylem
- ☐ B) the growth of roots
- ☐ C) the colour of the leaf
- ☐ D) the opening and closing of stomata
- ☐ E) the amount of light absorbed

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74 Name the cell in blood that is enucleate (has no nucleus) and allows more space for oxygen-carrying haemoglobin.

(1)

75 Which of these foods is NOT a good source of vitamin C?

- ☐ A) oranges
- ☐ B) kiwi fruit
- ☐ C) strawberries
- ☐ D) lemons
- ☐ E) rice

76 Which chemical do we use to test a leaf for starch?

- ☐ A) cobalt chloride paper
- ☐ B) limewater
- ☐ C) universal indicator
- ☐ D) iodine solution
- ☐ E) Benedict's solution

77 Name the nucleated component of blood that increases in number during an infection.

(1)

78 Which tubes carry water up from the roots to the leaves?

- ☐ A) phloem
- ☐ B) stomata
- ☐ C) xylem
- ☐ D) root hairs
- ☐ E) guard cells

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79 Name the main gas produced during respiration that must be removed from the body as a waste product.

(1)

80 Which of these foods is NOT a good source of protein?

- ☐ A) sugar
- ☐ B) beef
- ☐ C) chicken
- ☐ D) cod
- ☐ E) tofu

81 Movement is the life process that allows an organism to change position or location.

(a) Give one reason why the ability to move is important for many animals. **(1)**

(b) Name the tissue that contracts to bring about movement in animals. **(1)**

(c) Name the type of joint found at the elbow, and state the type of movement it allows. **(2)**

82 Which tubes carry sugars around the plant?

- ☐ A) phloem
- ☐ B) guard cells
- ☐ C) root hairs
- ☐ D) xylem
- ☐ E) stomata

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83 A student investigated enzyme activity at different temperatures. At 30°C, starch solution mixed with enzyme took 50 seconds to break down completely. Calculate the rate of reaction at 30°C using rate = 1000 / time taken (in seconds).

(1)

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84 Which of these foods is NOT a good source of fat?

- ☐ A) sunflower oil
- ☐ B) butter
- ☐ C) lard
- ☐ D) potatoes
- ☐ E) olive oil

---

85 Name the organs that filter excess water and salts from the blood.

(1)

---

86 Which of these foods is a good source of vitamin C?

- ☐ A) sunflower oil
- ☐ B) potatoes
- ☐ C) beef
- ☐ D) sugar
- ☐ E) strawberries

---

87 Why is a leaf usually broad and thin?

- ☐ A) to protect the stem from insects
- ☐ B) to absorb a large amount of light and let gases reach cells quickly
- ☐ C) to make the plant look bigger
- ☐ D) to store starch
- ☐ E) to hold a lot of water

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88 Name the organs that have Bowman's capsule and glomeruli to filter blood.

(1)

---

89 Which of these foods is NOT a good source of carbohydrate?

- ☐ A) pasta
- ☐ B) rice
- ☐ C) oranges
- ☐ D) sugar
- ☐ E) potatoes

---

90 Which process in plants releases energy from glucose?

- ☐ A) photosynthesis
- ☐ B) pollination
- ☐ C) fertilisation
- ☐ D) germination
- ☐ E) respiration

---

91 Which of these foods is NOT a good source of carbohydrate?

- ☐ A) sugar
- ☐ B) beef
- ☐ C) rice
- ☐ D) pasta
- ☐ E) potatoes

---

92 What happens to a plant's leaves if it has no light for several days?

- ☐ A) they turn yellow
- ☐ B) they turn red
- ☐ C) nothing changes
- ☐ D) they grow faster
- ☐ E) they turn blue

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93 A 13-year-old boy has a daily energy requirement of 2400 kcal. He eats breakfast with 600 kcal, a snack with 150 kcal, lunch with 750 kcal and dinner with 700 kcal. Calculate his total energy intake for the day.

(1)

---

94 Which of these foods is NOT a good source of fat?

- ☐ A) olive oil
- ☐ B) sunflower oil
- ☐ C) lard
- ☐ D) chicken
- ☐ E) butter

---

95 Through which structures do roots absorb water from the soil?

- ☐ A) root hairs
- ☐ B) guard cells
- ☐ C) stomata
- ☐ D) palisade cells
- ☐ E) xylem

---

96 Which is NOT a life process shown in the MRS GREN acronym?

- ☐ A) Respiration
- ☐ B) Reproduction
- ☐ C) Growth
- ☐ D) Circulation

---

97 Which of these foods is NOT a good source of fat?

- ☐ A) butter
- ☐ B) olive oil
- ☐ C) pasta
- ☐ D) sunflower oil
- ☐ E) lard

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98 Name the waste product removed from the skin in sweat.

(1)

99 Which of these foods is NOT a good source of carbohydrate?

- ☐ A) potatoes
- ☐ B) pasta
- ☐ C) sugar
- ☐ D) rice
- ☐ E) butter

100 What are the tiny holes on the underside of a leaf called?

- ☐ A) stomata
- ☐ B) xylem
- ☐ C) root hairs
- ☐ D) palisade cells
- ☐ E) phloem

101 Name the system that detects sensory changes and sends messages to muscles for responses.

(1)

102 Which of these foods is NOT a good source of protein?

- ☐ A) beef
- ☐ B) chicken
- ☐ C) sunflower oil
- ☐ D) tofu
- ☐ E) cod

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103 What is the joining of a male and a female gamete called?

- ☐ A) pollination
- ☐ B) fertilisation
- ☐ C) photosynthesis
- ☐ D) germination
- ☐ E) respiration

---

104 Which of these foods is NOT a good source of carbohydrate?

- ☐ A) pasta
- ☐ B) sugar
- ☐ C) potatoes
- ☐ D) rice
- ☐ E) lard

---

105 Name the type of reproduction that increases genetic diversity in a population.

(1)

---

106 Which of these foods is NOT a good source of fat?

- ☐ A) sunflower oil
- ☐ B) lard
- ☐ C) butter
- ☐ D) kiwi fruit
- ☐ E) olive oil

---

107 Name the organ that is the control centre of the nervous system.

(1)

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108 Respiration releases energy from food. It can happen with or without oxygen.

(a) Write the word equation for aerobic respiration. **(2)**

(b) State one difference between aerobic and anaerobic respiration in humans. **(1)**

(c) During a fast sprint, a runner's muscles cannot get enough oxygen from the blood. Name the substance that builds up in the muscles as a result. **(1)**

(d) State one effect on the muscles of the lactic acid built up during vigorous exercise. **(1)**

109 Which of these foods is NOT a good source of vitamin C?

- ☐ A) oranges
- ☐ B) tofu
- ☐ C) blackcurrants
- ☐ D) lemons
- ☐ E) strawberries

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Mark scheme · 3.1 Biology: Life Processes: 2-hour Pack

Question 1

Excretion (oe) **B1**

Answer: Excretion

Question 2

Lipase (oe) **B1**

Answer: Lipase

Question 3

Level 1 Basic, simple statements about the lungs or breathing, e.g. that the lungs take in oxygen. Little or no correct scientific vocabulary; points are not linked to gas exchange efficiency. **1-2**

Level 2 Describes more than one structural feature of the lungs (e.g. alveoli, thin walls, blood supply) with some correct link to gas exchange, but the explanation of how each feature increases the rate of diffusion may be incomplete or only partly linked. **3-4**

Level 3 Clear, detailed and logically linked account describing several structural features of the lungs (large number of alveoli giving a large surface area, thin alveolar walls, extensive capillary network, moist lining, ventilation), each explicitly and correctly linked to how it increases the rate of diffusion of oxygen and carbon dioxide, using correct scientific terminology throughout. **5-6**

Indicative content:

- The lungs contain millions of tiny alveoli, giving a very large total surface area for gas exchange.
- Alveolar walls (and the walls of the surrounding capillaries) are only one cell thick, giving a short diffusion distance/pathway for gases.
- Alveoli are surrounded by an extensive network of capillaries, which brings a good blood supply.
- This good blood supply continuously carries oxygen away and delivers carbon dioxide, maintaining a steep concentration gradient for diffusion.
- The inner surface of the alveoli is moist, which allows oxygen and carbon dioxide to dissolve, helping them diffuse across the surface.
- Ventilation (breathing in and out) continually brings fresh air with a high oxygen concentration into the alveoli and removes air high in carbon dioxide, maintaining the concentration gradients needed for efficient diffusion.
- Together, large surface area, short diffusion distance, good blood supply and ventilation all increase the rate of diffusion, in line with Fick's principle that rate of diffusion is proportional to surface area and concentration gradient, and inversely proportional to diffusion distance.

Question 4

Glucose (oe) **B1**

Answer: Glucose

Question 5

Plasma (oe) **B1**

Answer: Plasma

Question 6

20 (arbitrary rate units) (oe) **B1**

Answer: 20 (arbitrary rate units)

Question 7

Amylase (oe) **B1**

Answer: Amylase

Question 8

Autotrophic nutrition (oe) **B1**

Answer: Autotrophic nutrition

Question 9

A reflex action (oe) **B1**

Answer: A reflex action

Question 10

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

Question 11

Fat (oe) **B1**

Answer: Fat

Question 12

Platelets (oe) **B1**

Answer: Platelets

Question 13

A reflex action (oe) **B1**

Answer: A reflex action

Question 14

B (Synthesis) cao **B1**

Answer: B) Synthesis

Question 15

Asexual reproduction (oe) **B1**

Answer: Asexual reproduction

Question 16

A (Mitochondrion) cao **B1**

Answer: A) Mitochondrion

Question 17

Sexual reproduction (oe) **B1**

Answer: Sexual reproduction

Question 18

Lactic acid (oe) **B1**

Answer: Lactic acid

Question 19

8.3 (arbitrary rate units) (oe) **B1**

Answer: 8.3 (arbitrary rate units)

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Question 20

Amylase (oe) **B1**

Answer: Amylase

Question 21

Amylase (oe) **B1**

Answer: Amylase

Question 22

150 kcal deficit (oe) **B1**

Answer: 150 kcal deficit

Question 23

White blood cells (oe) **B1**

Answer: White blood cells

Question 24

Nutrition (oe) **B1**

Answer: Nutrition

Question 25

C (Chloroplast) cao **B1**

Answer: C) Chloroplast

Question 26

2030 kcal (oe) **B1**

Answer: 2030 kcal

Question 27

200 kcal deficit (oe) **B1**

Answer: 200 kcal deficit

Question 28

Asexual reproduction (oe) **B1**

Answer: Asexual reproduction

Question 29

D (Aorta) cao **B1**

Answer: D) Aorta

Question 30

Platelets (oe) **B1**

Answer: Platelets

Question 31

B (Growth) cao **B1**

Answer: B) Growth

Question 32

B (Benedict's solution turns orange-red when heated) **B1**

Answer: B) Benedict's solution turns orange-red when heated

Question 33

Platelets (oe) **B1**

Answer: Platelets

Question 34

Plasma (oe) **B1**

Answer: Plasma

Question 35

The kidney(s) (oe) **B1**

Answer: The kidney(s)

Question 36

Capillaries (oe) **B1**

Answer: Capillaries

Question 37

2150 kcal (oe) **B1**

Answer: 2150 kcal

Question 38

The nervous system (oe) **B1**

Answer: The nervous system

Question 39

The liver (oe) **B1**

Answer: The liver

Question 40

The liver (oe) **B1**

Answer: The liver

Question 41

Capillaries (oe) **B1**

Answer: Capillaries

Question 42

E (oxygen) **B1**

Answer: E) oxygen

Question 43

Capillaries (oe) **B1**

Answer: Capillaries

Question 44

B (Pulmonary vein) cao **B1**

Answer: B) Pulmonary vein

Question 45

Lactic acid (oe) **B1**

Answer: Lactic acid

Question 46

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

Question 47

30 kcal deficit (oe) **B1**

Answer: 30 kcal deficit

Question 48

A (oranges) **B1**

Answer: A) oranges

Question 49

C (iodine solution turns blue-black) **B1**

Answer: C) iodine solution turns blue-black

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Question 50

D (chlorophyll) **B1**

Answer: D) chlorophyll

Question 51

A (blackcurrants) **B1**

Answer: A) blackcurrants

Question 52

B (mixing with ethanol, then water, gives a cloudy white emulsion) **B1**

Answer: B) mixing with ethanol, then water, gives a cloudy white emulsion

Question 53

E (carbon dioxide) **B1**

Answer: E) carbon dioxide

Question 54

Glucose (oe) **B1**

Answer: Glucose

Question 55

C (chicken) **B1**

Answer: C) chicken

Question 56

D (fat) **B1**

Answer: D) fat

Question 57

The nervous system (oe) **B1**

Answer: The nervous system

Question 58

A (beef) **B1**

Answer: A) beef

Question 59

B (a reducing sugar such as glucose) **B1**

Answer: B) a reducing sugar such as glucose

Question 60

E (germination) **B1**

Answer: E) germination

Question 61

Muscle (tissue) (oe) **B1**

Answer: Muscle (tissue)

Question 62

(a) any one of: cell wall / (large permanent) vacuole / chloroplast **B1**

(a) a second, different structure from the same list **B1**

(a) Answer: Any two of: cell wall, (large permanent) vacuole, chloroplast.

(b) supports the cell and keeps its shape (rigid), preventing it from bursting, oe **B1**

(b) Answer: It supports the cell and keeps a fixed shape, stopping the cell from bursting.

(c) site of photosynthesis; absorbs light energy (using chlorophyll) to make food/glucose, oe **B1**

(c) Answer: It is where photosynthesis takes place, using light energy to make food (glucose).

Question 63

A (kiwi fruit) **B1**

Answer: A) kiwi fruit

Question 64

B (glucose) **B1**

Answer: B) glucose

Question 65

40 (arbitrary rate units) (oe) **B1**

Answer: 40 (arbitrary rate units)

Question 66

C (tofu) **B1**

Answer: C) tofu

Question 67

E (protein) **B1**

Answer: E) protein

Question 68

A (pollination) **B1**

Answer: A) pollination

Question 69

Asexual reproduction (oe) **B1**

Answer: Asexual reproduction

Question 70

B (oranges) **B1**

Answer: B) oranges

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Question 71

(a) the ability to detect and respond to changes in the environment (stimuli), oe **B1**

(a) Answer: The ability to detect and respond to changes (stimuli) in the surroundings.

(b) (the) nervous system (cao) **B1**

(b) Answer: The nervous system.

(c) reflex (action) cao **B1**

(c) Answer: A reflex action.

(d) receptor placed first, followed by sensory neurone **B1**

(d) relay neurone, then motor neurone, then effector, completing the sequence in this order **B1**

(d) Answer: Receptor, sensory neurone, relay neurone, motor neurone, effector.

Question 72

C (pasta) **B1**

Answer: C) pasta

Question 73

D (the opening and closing of stomata) **B1**

Answer: D) the opening and closing of stomata

Question 74

Red blood cells (oe) **B1**

Answer: Red blood cells

Question 75

E (rice) **B1**

Answer: E) rice

Question 76

D (iodine solution) **B1**

Answer: D) iodine solution

Question 77

White blood cells (oe) **B1**

Answer: White blood cells

Question 78

C (xylem) **B1**

Answer: C) xylem

Question 79

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

Question 80

A (sugar) **B1**

Answer: A) sugar

Question 81

(a) any sensible reason, e.g. to find food or a mate, to escape from predators/danger, oe **B1**

(a) Answer: For example, to find food or escape from predators.

(b) muscle (tissue) cao **B1**

(b) Answer: Muscle (tissue).

(c) hinge joint (cao) **B1**

(c) allows movement in one plane only (backwards and forwards, like a door hinge), oe **B1**

(c) Answer: A hinge joint, which allows movement backwards and forwards in one plane only.

Question 82

A (phloem) **B1**

Answer: A) phloem

Question 83

20 (arbitrary rate units) (oe) **B1**

Answer: 20 (arbitrary rate units)

Question 84

D (potatoes) **B1**

Answer: D) potatoes

Question 85

The kidneys (oe) **B1**

Answer: The kidneys

Question 86

E (strawberries) **B1**

Answer: E) strawberries

Question 87

B (to absorb a large amount of light and let gases reach cells quickly) **B1**

Answer: B) to absorb a large amount of light and let gases reach cells quickly

Question 88

The kidney(s) (oe) **B1**

Answer: The kidney(s)

Question 89

C (oranges) **B1**

Answer: C) oranges

Question 90

E (respiration) **B1**

Answer: E) respiration

Question 91

B (beef) **B1**

Answer: B) beef

Question 92

A (they turn yellow) **B1**

Answer: A) they turn yellow

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Question 93

2200 kcal (oe) **B1**

Answer: 2200 kcal

Question 94

D (chicken) **B1**

Answer: D) chicken

Question 95

A (root hairs) **B1**

Answer: A) root hairs

Question 96

D (Circulation) cao **B1**

Answer: D) Circulation

Question 97

C (pasta) **B1**

Answer: C) pasta

Question 98

Urea (oe) **B1**

Answer: Urea

Question 99

E (butter) **B1**

Answer: E) butter

Question 100

A (stomata) **B1**

Answer: A) stomata

Question 101

The nervous system (oe) **B1**

Answer: The nervous system

Question 102

C (sunflower oil) **B1**

Answer: C) sunflower oil

Question 103

B (fertilisation) **B1**

Answer: B) fertilisation

Question 104

E (lard) **B1**

Answer: E) lard

Question 105

Sexual reproduction (oe) **B1**

Answer: Sexual reproduction

Question 106

D (kiwi fruit) **B1**

Answer: D) kiwi fruit

Question 107

The brain (oe) **B1**

Answer: The brain

Question 108

(a) glucose + oxygen on the left-hand side **B1**

(a) carbon dioxide + water (+ energy released) on the right-hand side **B1**

(a) Answer: glucose + oxygen -> carbon dioxide + water (+ energy released)

(b) anaerobic respiration does not need oxygen (aerobic does); or anaerobic produces lactic acid instead of carbon dioxide and water; or anaerobic releases less energy than aerobic (any one, oe) **B1**

(b) Answer: Aerobic respiration needs oxygen and releases carbon dioxide and water, while anaerobic respiration happens without oxygen and produces lactic acid instead.

(c) lactic acid (cao) **B1**

(c) Answer: Lactic acid.

(d) causes muscle fatigue and/or cramp/pain, oe **B1**

(d) Answer: It can cause the muscles to become fatigued and to cramp.

Question 109

B (tofu) **B1**

Answer: B) tofu

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