3.1 Biology: Life Processes: 1-hour Pack

ISEB CE 13+ Science (Biology) · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Name the organs where urea is concentrated in the collecting duct to form concentrated urine.

(1)

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

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

3 A teenage girl has a daily energy need of 2200 kcal. Her meals contain: breakfast 560 kcal, mid-morning snack 170 kcal, lunch 730 kcal, afternoon snack 120 kcal and dinner 600 kcal. Calculate her total daily energy intake.

(1)

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

- ☐ A) oranges
- ☐ B) strawberries
- ☐ C) rice
- ☐ D) butter
- ☐ E) lard

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5 Name the main gas in exhaled breath that is not present in inspired air.

.....

(1)

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6 Which of these is NOT a characteristic of living organisms?

- ☐ A) Reflection
- ☐ B) Reproduction
- ☐ C) Respiration
- ☐ D) Nutrition

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7 Which of these foods is a good source of fat?

- ☐ A) oranges
- ☐ B) cod
- ☐ C) potatoes
- ☐ D) pasta
- ☐ E) sunflower oil

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8 A 13-year-old pupil has an estimated daily energy requirement of 2200 kcal and consumes 2350 kcal. Calculate the difference between his energy requirement and his energy intake for the day, stating whether this is a surplus or a deficit.

(1)

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

- ☐ A) cod
- ☐ B) lemons
- ☐ C) olive oil
- ☐ D) lard
- ☐ E) potatoes

---

10 Name the cell fragments that prevent excessive blood loss after an injury.

.....

(1)

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

- ☐ A) chicken
- ☐ B) rice
- ☐ C) butter
- ☐ D) oranges
- ☐ E) sunflower oil

---

12 Name the product of anaerobic respiration in muscle cells that causes the burning sensation during intense exercise.

.....

(1)

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13 Which organelle is packed with enzymes for breaking down glucose during aerobic respiration?

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

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14 Which of these foods is a good source of fat?

- ☐ A) pasta
- ☐ B) kiwi fruit
- ☐ C) butter
- ☐ D) chicken
- ☐ E) tofu

---

15 Name the substance produced when muscles respire without enough oxygen during a long-distance run.

.....

.....

.....

.....

.....

(1)

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16 When you blink in response to something moving towards your eye, name the type of inborn response this represents.

(1)

17 Name the cell in blood that phagocytoses bacteria and helps protect against infection.

(1)

18 Name the tissue that is attached to bone by tendons and can contract to produce movement.

(1)

19 Which blood vessel has thick, elastic walls and carries blood at high pressure to the body?

- ☐ A) Capillary
- ☐ B) Aorta
- ☐ C) Pulmonary vein
- ☐ D) Vena cava

20 Name the enzyme found in the stomach that begins the digestion of proteins.

(1)

21 A 13-year-old girl's daily energy requirement is 2200 kcal. In a day she consumes breakfast of 540 kcal, snack of 180 kcal, lunch of 720 kcal and dinner of 660 kcal. Calculate her total energy intake.

(1)

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22 Name the type of reproduction in which two gametes fuse during fertilisation.

(1)

23 Name the life process in which a bacterium divides to form two identical daughter cells.

(1)

24 Name the life process by which an organism obtains and uses energy from food.

(1)

25 Name the carbohydrase enzyme produced by the salivary glands that begins polysaccharide digestion.

(1)

26 Name the blood vessels that join arterioles and venules and are the main site of substance exchange.

(1)

27 State the type of nutrition that plants use to make their own food using light energy.

(1)

28 Name the respiratory waste product that binds to red blood cells for transport from body cells to the lungs.

(1)

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29 A 13-year-old pupil eats 520 kcal at breakfast, 200 kcal as a morning snack, 780 kcal at lunch and 620 kcal at dinner. Calculate the total energy intake.

(1)

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30 Which of the following is NOT one of the seven life processes?

- ☐ A) Digestion
- ☐ B) Nutrition
- ☐ C) Growth
- ☐ D) Sensitivity

---

31 A 13-year-old pupil eats a breakfast of 580 kcal, a mid-morning snack of 140 kcal, lunch of 700 kcal and dinner of 750 kcal. Calculate the total energy intake for the day.

(1)

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32 Which organelle is responsible for producing energy during aerobic respiration?

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

---

33 State the type of reproduction shown by yeast cells budding off from a parent cell.

(1)

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34 Name the living tissue that is controlled by the nervous system and allows animals to move around.

(1)

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35 Name the organs that filter nitrogenous waste from the blood and produce urine.

(1)

36 Name the organ system that carries hormonal messages around the body.

(1)

37 Name the waste product released from the body when breathing out.

(1)

38 Name the automatic response in which a sensory neurone connects directly to a motor neurone in the spinal cord.

(1)

39 Name the simple units that fats are broken down into during digestion.

(1)

40 Name the component of blood that helps stop bleeding by forming blood clots.

(1)

41 Name the component of blood that carries carbon dioxide from the cells to the lungs.

(1)

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42 Name the life process that allows an organism to respond to changes in its environment.

(1)

43 Name the reducing sugar produced by the complete digestion of starch by amylase and maltase.

(1)

44 Name the enzyme found in the small intestine that completes the digestion of proteins.

(1)

45 Name the system made up of the brain, spinal cord and nerves that controls rapid responses to stimuli.

(1)

46 Name the protein inside red blood cells that binds to oxygen molecules.

(1)

47 Name the organ system that carries messages as chemical signals between different parts of the body.

(1)

48 Name the type of blood cell that produces antibodies to defend the body.

(1)

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49 Name the type of reproduction by which a sperm cell and egg cell fuse to form a new organism.

.....

(1)

50 When you touch a hot surface and pull your hand away immediately, name this type of automatic protective response.

.....

(1)

51 Name the form of nutrition in which organisms synthesise complex organic molecules from carbon dioxide and water.

.....

(1)

52 Name the component of blood that releases proteins to help fight infection.

.....

(1)

53 During intense exercise, a runner's muscles use up their oxygen supply quickly. Name the substance that builds up in the muscles as a result of anaerobic respiration.

.....

(1)

54 Name the blood cells that carry oxygen from the lungs to all body tissues.

.....

(1)

55 Name the life process that describes an organism getting bigger and developing more cells.

.....

(1)

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56 Growth and reproduction are two of the seven life processes.

(a) Define growth. **(1)**

(b) State one difference between growth in most animals and growth in many plants. **(1)**

(c) Name the type of reproduction that involves only one parent and produces genetically identical offspring. **(1)**

(d) Name the type of reproduction that involves two parents and produces genetic variation in the offspring. **(1)**

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57 A slice of toast contains 15 g of carbohydrate, 3 g of protein and 2 g of fat. Each gram of carbohydrate and each gram of protein provides 4 kcal of energy; each gram of fat provides 9 kcal of energy.

(a) Calculate the total energy content of the slice of toast, in kcal. **(3)**

(b) State one health problem that could result from regularly eating too much fat over a long period of time. **(1)**

(c) Name the food group that is most important for the growth and repair of body tissues. **(1)**

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Mark scheme · 3.1 Biology: Life Processes: 1-hour Pack

Question 1

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

Answer: The kidney(s)

Question 2

D (blackcurrants) **B1**

Answer: D) blackcurrants

Question 3

2180 kcal (oe) **B1**

Answer: 2180 kcal

Question 4

C (rice) **B1**

Answer: C) rice

Question 5

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

Question 6

A (Reflection) cao **B1**

Answer: A) Reflection

Question 7

E (sunflower oil) **B1**

Answer: E) sunflower oil

Question 8

150 kcal surplus (oe) **B1**

Answer: 150 kcal surplus

Question 9

B (lemons) **B1**

Answer: B) lemons

Question 10

Platelets (oe) **B1**

Answer: Platelets

Question 11

A (chicken) **B1**

Answer: A) chicken

Question 12

Lactic acid (oe) **B1**

Answer: Lactic acid

Question 13

D (Mitochondrion) cao **B1**

Answer: D) Mitochondrion

Question 14

C (butter) **B1**

Answer: C) butter

Question 15

Lactic acid (oe) **B1**

Answer: Lactic acid

Question 16

A reflex action (oe) **B1**

Answer: A reflex action

Question 17

White blood cells (oe) **B1**

Answer: White blood cells

Question 18

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

Answer: Muscle (tissue)

Question 19

B (Aorta) cao **B1**

Answer: B) Aorta

Question 20

Pepsin (oe) **B1**

Answer: Pepsin

Question 21

2100 kcal (oe) **B1**

Answer: 2100 kcal

Question 22

Sexual reproduction (oe) **B1**

Answer: Sexual reproduction

Question 23

Reproduction (oe) **B1**

Answer: Reproduction

Question 24

Nutrition (oe) **B1**

Answer: Nutrition

Question 25

Amylase (oe) **B1**

Answer: Amylase

Question 26

Capillaries (oe) **B1**

Answer: Capillaries

Question 27

Autotrophic nutrition (oe) **B1**

Answer: Autotrophic nutrition

Question 28

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

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Question 29

2120 kcal (oe) **B1**

Answer: 2120 kcal

Question 30

A (Digestion) cao **B1**

Answer: A) Digestion

Question 31

2170 kcal (oe) **B1**

Answer: 2170 kcal

Question 32

D (Mitochondrion) cao **B1**

Answer: D) Mitochondrion

Question 33

Asexual reproduction (oe) **B1**

Answer: Asexual reproduction

Question 34

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

Answer: Muscle (tissue)

Question 35

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

Answer: The kidney(s)

Question 36

The endocrine system (oe) **B1**

Answer: The endocrine system

Question 37

Carbon dioxide (oe) **B1**

Answer: Carbon dioxide

Question 38

A reflex action (oe) **B1**

Answer: A reflex action

Question 39

Fatty acids and glycerol (oe) **B1**

Answer: Fatty acids and glycerol

Question 40

Platelets (oe) **B1**

Answer: Platelets

Question 41

Plasma (oe) **B1**

Answer: Plasma

Question 42

Sensitivity (oe) **B1**

Answer: Sensitivity

Question 43

Glucose (oe) **B1**

Answer: Glucose

Question 44

Trypsin (oe) **B1**

Answer: Trypsin

Question 45

The nervous system (oe) **B1**

Answer: The nervous system

Question 46

Haemoglobin (oe) **B1**

Answer: Haemoglobin

Question 47

The endocrine system (oe) **B1**

Answer: The endocrine system

Question 48

White blood cells (oe) **B1**

Answer: White blood cells

Question 49

Sexual reproduction (oe) **B1**

Answer: Sexual reproduction

Question 50

A reflex action (oe) **B1**

Answer: A reflex action

Question 51

Autotrophic nutrition (oe) **B1**

Answer: Autotrophic nutrition

Question 52

White blood cells (oe) **B1**

Answer: White blood cells

Question 53

Lactic acid (oe) **B1**

Answer: Lactic acid

Question 54

Red blood cells (oe) **B1**

Answer: Red blood cells

Question 55

Growth (oe) **B1**

Answer: Growth

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Question 56

(a) a permanent increase in size and/or mass (number of cells), oe **B1**

(a) Answer: A permanent increase in the size or mass of an organism.

(b) most animals stop growing once they reach adult size, whereas many plants continue growing throughout their life, oe **B1**

(b) Answer: Most animals stop growing when they reach adult size, but many plants keep growing for their whole life.

(c) asexual reproduction (cao) **B1**

(c) Answer: Asexual reproduction.

(d) sexual reproduction (cao) **B1**

(d) Answer: Sexual reproduction.

Question 57

(a) energy from carbohydrate and protein: (15 x 4) + (3 x 4) = 72 kcal **M1**

(a) energy from fat: 2 x 9 = 18 kcal, then adds to previous total **M1**

(a) 90 kcal cao **A1**

(a) Answer: 90 kcal

(b) obesity / heart disease / high blood cholesterol (any one, oe) **B1**

(b) Answer: For example, obesity or heart disease.

(c) protein (cao) **B1**

(c) Answer: Protein.

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