3.5 Biology: Cells, Body Systems and Reproduction: 2-hour Pack

Total Marks

ISEB Common Entrance Biology (13+) · Calculator allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A person's heart beats 75 times per minute and pumps 60 cm^3 of blood with each beat. Calculate the cardiac output (blood pumped per minute) in dm3 per minute. (1 dm3 = 1000 cm^3.)

- [ ] A) 45 dm3/min
- [ ] B) 270 dm3/min
- [ ] C) 4.5 dm3/min
- [ ] D) 1.25 dm3/min
- [ ] E) 4500 dm3/min

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2 Which body system do the capillaries belong to?

- [ ] A) the circulatory system
- [ ] B) the nervous system
- [ ] C) the respiratory system
- [ ] D) the digestive system
- [ ] E) the excretory system

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3 A person's heart beats 72 times per minute and pumps 70 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 50400 cm^3/min
- [ ] B) 5040 cm^3/min
- [ ] C) 142 cm^3/min
- [ ] D) 302400 cm^3/min
- [ ] E) 504 cm^3/min

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4 Which body system do the lungs belong to?

- [ ] A) the circulatory system
- [ ] B) the digestive system
- [ ] C) the excretory system
- [ ] D) the respiratory system
- [ ] E) the nervous system

---

5 A person's heart beats 75 times per minute and pumps 100 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 75000 cm^3/min
- [ ] B) 0.75 cm^3/min
- [ ] C) 7500 cm^3/min
- [ ] D) 175 cm^3/min
- [ ] E) 450000 cm^3/min

---

6 Which of these is NOT part of the respiratory system?

- [ ] A) bladder
- [ ] B) bronchi
- [ ] C) alveoli
- [ ] D) lungs
- [ ] E) trachea (windpipe)

---

7 Nina measures the resting pulse five times: 75, 79, 77, 76, 78 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 7.7 beats/min
- [ ] B) 77 beats/min
- [ ] C) 96.25 beats/min
- [ ] D) 770 beats/min
- [ ] E) 385 beats/min

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8 A person's heart beats 80 times per minute and pumps 70 cm³ of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 56000 cm³/min
- [ ] B) 336000 cm³/min
- [ ] C) 0.875 cm³/min
- [ ] D) 150 cm³/min
- [ ] E) 5600 cm³/min

---

9 Which of these is NOT part of the respiratory system?

- [ ] A) alveoli
- [ ] B) bronchi
- [ ] C) diaphragm
- [ ] D) trachea (windpipe)
- [ ] E) stomach

---

10 A person's heart beats 90 times per minute and pumps 65 cm³ of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 155 cm³/min
- [ ] B) 5850 cm³/min
- [ ] C) 351000 cm³/min
- [ ] D) 585 cm³/min
- [ ] E) 58500 cm³/min

---

11 Which body system do the oesophagus belong to?

- [ ] A) the excretory system
- [ ] B) the nervous system
- [ ] C) the respiratory system
- [ ] D) the digestive system
- [ ] E) the circulatory system

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12 A pupil's pulse is 60 beats per minute at rest and 90 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- [ ] A) 500%
- [ ] B) 0.5%
- [ ] C) 50%
- [ ] D) 30%
- [ ] E) 150%

---

13 Which body system does the brain belong to?

- [ ] A) the nervous system
- [ ] B) the digestive system
- [ ] C) the circulatory system
- [ ] D) the respiratory system
- [ ] E) the excretory system

---

14 Sam measures the resting pulse five times: 62, 63, 59, 61, 65 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 62 beats/min
- [ ] B) 77.5 beats/min
- [ ] C) 620 beats/min
- [ ] D) 310 beats/min
- [ ] E) 6.2 beats/min

---

15 Which of these is NOT part of the circulatory system?

- [ ] A) veins
- [ ] B) capillaries
- [ ] C) heart
- [ ] D) nerves
- [ ] E) arteries

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16 Chloe measures the resting pulse five times: 71, 65, 68, 66, 70 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 340 beats/min
- [ ] B) 6.8 beats/min
- [ ] C) 68 beats/min
- [ ] D) 680 beats/min
- [ ] E) 85 beats/min

---

17 Which body system does the alveoli belong to?

- [ ] A) the circulatory system
- [ ] B) the respiratory system
- [ ] C) the nervous system
- [ ] D) the digestive system
- [ ] E) the excretory system

---

18 A person's heart beats 150 times per minute and pumps 70 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 220 cm^3/min
- [ ] B) 105000 cm^3/min
- [ ] C) 630000 cm^3/min
- [ ] D) 1050 cm^3/min
- [ ] E) 10500 cm^3/min

---

19 Which of these is NOT part of the respiratory system?

- [ ] A) alveoli
- [ ] B) bronchi
- [ ] C) diaphragm
- [ ] D) trachea (windpipe)
- [ ] E) arteries

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20 Ben measures the resting pulse five times: 67, 66, 65, 63, 69 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 660 beats/min
- [ ] B) 55 beats/min
- [ ] C) 66 beats/min
- [ ] D) 82.5 beats/min
- [ ] E) 330 beats/min

---

21 Which body system does the bronchi belong to?

- [ ] A) the circulatory system
- [ ] B) the nervous system
- [ ] C) the digestive system
- [ ] D) the respiratory system
- [ ] E) the excretory system

---

22 A person's heart beats 90 times per minute and pumps 75 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 6750 cm^3/min
- [ ] B) 67500 cm^3/min
- [ ] C) 405000 cm^3/min
- [ ] D) 1.2 cm^3/min
- [ ] E) 165 cm^3/min

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23 Which of these is NOT part of the digestive system?

- [ ] A) large intestine
- [ ] B) veins
- [ ] C) oesophagus
- [ ] D) liver
- [ ] E) stomach

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24 Sam counts 6 breaths in 30 seconds while resting. Calculate the breathing rate in breaths per minute.

- [ ] A) 0.2 breaths/min
- [ ] B) 12 breaths/min
- [ ] C) 36 breaths/min
- [ ] D) 24 breaths/min
- [ ] E) 6 breaths/min

---

25 Which body system does the large intestine belong to?

- [ ] A) the excretory system
- [ ] B) the circulatory system
- [ ] C) the nervous system
- [ ] D) the digestive system
- [ ] E) the respiratory system

---

26 Priya measures the resting pulse five times: 68, 61, 65, 62, 69 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 6.5 beats/min
- [ ] B) 325 beats/min
- [ ] C) 81.25 beats/min
- [ ] D) 650 beats/min
- [ ] E) 65 beats/min

---

27 Which body system does the spinal cord belong to?

- [ ] A) the digestive system
- [ ] B) the circulatory system
- [ ] C) the nervous system
- [ ] D) the respiratory system
- [ ] E) the excretory system

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28 A person's heart beats 75 times per minute and pumps 80 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 6000 cm^3/min
- [ ] B) 60000 cm^3/min
- [ ] C) 155 cm^3/min
- [ ] D) 360000 cm^3/min
- [ ] E) 600 cm^3/min

---

29 Which body system does the bladder belong to?

- [ ] A) the digestive system
- [ ] B) the excretory system
- [ ] C) the circulatory system
- [ ] D) the respiratory system
- [ ] E) the nervous system

---

30 Priya counts 6 breaths in 15 seconds while resting. Calculate the breathing rate in breaths per minute.

- [ ] A) 24 breaths/min
- [ ] B) 0.4 breaths/min
- [ ] C) 6 breaths/min
- [ ] D) 12 breaths/min
- [ ] E) 51 breaths/min

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31 Which body system does the diaphragm belong to?

- [ ] A) the nervous system
- [ ] B) the excretory system
- [ ] C) the digestive system
- [ ] D) the respiratory system
- [ ] E) the circulatory system

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32 A person's heart beats 70 times per minute and pumps 80 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 0.875 cm^3/min
- [ ] B) 150 cm^3/min
- [ ] C) 5600 cm^3/min
- [ ] D) 56000 cm^3/min
- [ ] E) 336000 cm^3/min

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33 Which body system do the nerves belong to?

- [ ] A) the excretory system
- [ ] B) the digestive system
- [ ] C) the circulatory system
- [ ] D) the respiratory system
- [ ] E) the nervous system

---

34 A person's heart beats 120 times per minute and pumps 90 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 0.75 cm^3/min
- [ ] B) 210 cm^3/min
- [ ] C) 10800 cm^3/min
- [ ] D) 108000 cm^3/min
- [ ] E) 648000 cm^3/min

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35 Which body system does the heart belong to?

- [ ] A) the digestive system
- [ ] B) the nervous system
- [ ] C) the excretory system
- [ ] D) the respiratory system
- [ ] E) the circulatory system

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36 A person's heart beats 80 times per minute and pumps 100 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 8000 cm^3/min
- [ ] B) 480000 cm^3/min
- [ ] C) 180 cm^3/min
- [ ] D) 0.8 cm^3/min
- [ ] E) 1.25 cm^3/min

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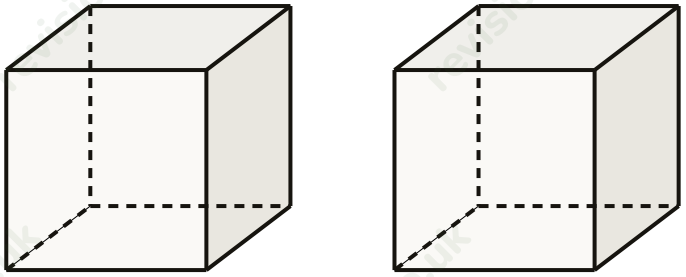
37 A pupil's pulse is 60 beats per minute at rest and 72 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- [ ] A) 12%
- [ ] B) 120%
- [ ] C) 0.2%
- [ ] D) 20%
- [ ] E) 200%

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38 Cells are usually very small. This question looks at why, by comparing two cube-shaped cells.

Diagram NOT accurately drawn



(a) A cube-shaped cell has sides of length 2 mm. Calculate its surface area to volume ratio. **(2)**

.....

(b) A second cube-shaped cell has sides of length 4 mm. Calculate its surface area to volume ratio. **(2)**

.....

(c) State which cell would be more efficient at obtaining substances by diffusion, and explain why, using your answers to (a) and (b). **(2)**

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39 Which of these is part of the respiratory system?

- ☐ A) spinal cord
- ☐ B) veins
- ☐ C) arteries
- ☐ D) large intestine
- ☐ E) bronchi

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40 A person's heart beats 100 times per minute and pumps 100 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- [ ] A) 600000 cm^3/min
- [ ] B) 200 cm^3/min
- [ ] C) 10000 cm^3/min
- [ ] D) 1 cm^3/min
- [ ] E) 100000 cm^3/min

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41 Which body system does the liver belong to?

- [ ] A) the nervous system
- [ ] B) the digestive system
- [ ] C) the respiratory system
- [ ] D) the circulatory system
- [ ] E) the excretory system

---

42 Chloe counts 12 breaths in 30 seconds while resting. Calculate the breathing rate in breaths per minute.

- [ ] A) 12 breaths/min
- [ ] B) 42 breaths/min
- [ ] C) 0.4 breaths/min
- [ ] D) 24 breaths/min
- [ ] E) 48 breaths/min

---

43 Which body system do the arteries belong to?

- [ ] A) the circulatory system
- [ ] B) the digestive system
- [ ] C) the excretory system
- [ ] D) the nervous system
- [ ] E) the respiratory system

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44 A pupil's pulse is 80 beats per minute at rest and 112 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- [ ] A) 0.4%
- [ ] B) 40%
- [ ] C) 140%
- [ ] D) 32%
- [ ] E) 400%

---

45 Which body system does the trachea (windpipe) belong to?

- [ ] A) the digestive system
- [ ] B) the circulatory system
- [ ] C) the nervous system
- [ ] D) the respiratory system
- [ ] E) the excretory system

---

46 Hana measures the resting pulse five times: 73, 67, 70, 68, 72 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 70 beats/min
- [ ] B) 7 beats/min
- [ ] C) 700 beats/min
- [ ] D) 350 beats/min
- [ ] E) 87.5 beats/min

---

47 Which of these is part of the digestive system?

- [ ] A) kidneys
- [ ] B) capillaries
- [ ] C) bladder
- [ ] D) trachea (windpipe)
- [ ] E) small intestine

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48 A pupil's pulse is 60 beats per minute at rest and 78 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- ☐ A) 0.3%
- ☐ B) 300%
- ☐ C) 30%
- ☐ D) 18%
- ☐ E) 130%

---

49 A tissue sample starts with 5 cells. The cells divide by mitosis, doubling in number every 20 minutes.

(a) Calculate how many cells will be present after 2 hours. **(3)**

.....

(b) Name the type of cell division responsible for this increase in cell number. **(1)**

---

50 Which of these is part of the excretory system?

- ☐ A) capillaries
- ☐ B) alveoli
- ☐ C) diaphragm
- ☐ D) ureters
- ☐ E) bronchi

---

51 A person's heart beats 70 times per minute and pumps 90 cm^3 of blood with each beat. Calculate the cardiac output (volume pumped per minute) in cm3 per minute.

- ☐ A) 160 cm^3/min
- ☐ B) 6300 cm^3/min
- ☐ C) 63000 cm^3/min
- ☐ D) 630 cm^3/min
- ☐ E) 378000 cm^3/min

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52 Nina counts 5 breaths in 15 seconds while resting. Calculate the breathing rate in breaths per minute.

- [ ] A) 5 breaths/min
- [ ] B) 10 breaths/min
- [ ] C) 200 breaths/min
- [ ] D) 50 breaths/min
- [ ] E) 20 breaths/min

---

53 Which of these is part of the respiratory system?

- [ ] A) kidneys
- [ ] B) stomach
- [ ] C) alveoli
- [ ] D) large intestine
- [ ] E) small intestine

---

54 A pupil's pulse is 70 beats per minute at rest and 91 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- [ ] A) 21%
- [ ] B) 30%
- [ ] C) 0.3%
- [ ] D) 130%
- [ ] E) 300%

---

55 Which of these is part of the excretory system?

- [ ] A) brain
- [ ] B) bronchi
- [ ] C) spinal cord
- [ ] D) liver
- [ ] E) bladder

---

56 Which part of the cell directs protein synthesis and stores genes?

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

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57 Chloe measures the resting pulse five times: 78, 84, 76, 80, 82 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 400 beats/min
- [ ] B) 100 beats/min
- [ ] C) 8 beats/min
- [ ] D) 80 beats/min
- [ ] E) 800 beats/min

---

58 Which part of the circulatory system is mainly responsible for exchanging substances between the blood and the body cells?

- [ ] A) veins
- [ ] B) platelets
- [ ] C) capillaries
- [ ] D) red blood cells
- [ ] E) arteries

---

59 What is the main job of the cell membrane?

- [ ] A) controlling the cell's activities and holding the genetic material
- [ ] B) carrying out photosynthesis
- [ ] C) storing cell sap and keeping a plant cell firm
- [ ] D) making proteins
- [ ] E) controlling what enters and leaves the cell

---

60 Which organ is mainly responsible for carrying air to the lungs?

- [ ] A) bladder
- [ ] B) gall bladder
- [ ] C) trachea (windpipe)
- [ ] D) heart
- [ ] E) large intestine

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61 Which of these cell parts is NOT found in both plant cells and animal cells?

- [ ] A) cell wall
- [ ] B) cell membrane
- [ ] C) nucleus
- [ ] D) cytoplasm
- [ ] E) mitochondria

---

62 Which of these is NOT part of the circulatory system?

- [ ] A) capillaries
- [ ] B) arteries
- [ ] C) veins
- [ ] D) alveoli
- [ ] E) heart

---

63 An onion root cell divides regularly, with the number of cells doubling every 8 hours. Name the type of cell division responsible for this growth.

(1)

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64 Leah measures the resting pulse five times: 66, 67, 65, 64, 63 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 81.25 beats/min
- [ ] B) 650 beats/min
- [ ] C) 325 beats/min
- [ ] D) 6.5 beats/min
- [ ] E) 65 beats/min

---

65 Which part of the circulatory system is mainly responsible for carrying blood away from the heart at high pressure?

- [ ] A) the diaphragm
- [ ] B) arteries
- [ ] C) plasma
- [ ] D) red blood cells
- [ ] E) white blood cells

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66 What is the main job of the chloroplasts?

- [ ] A) releasing energy from food in respiration
- [ ] B) strengthening and supporting a plant cell
- [ ] C) carrying out photosynthesis
- [ ] D) hosting most of the cell's chemical reactions
- [ ] E) making proteins

---

67 Which of these cell parts is NOT found in both plant cells and animal cells?

- [ ] A) cytoplasm
- [ ] B) nucleus
- [ ] C) ribosomes
- [ ] D) permanent vacuole
- [ ] E) cell membrane

---

68 Which of these is NOT part of the digestive system?

- [ ] A) oesophagus
- [ ] B) nerves
- [ ] C) liver
- [ ] D) stomach
- [ ] E) large intestine

---

69 When does the bleeding phase of the menstrual cycle start in a 28-day cycle?

(1)

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70 Chloe measures the resting pulse five times: 63, 64, 67, 61, 65 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 64 beats/min
- [ ] B) 640 beats/min
- [ ] C) 320 beats/min
- [ ] D) 6.4 beats/min
- [ ] E) 80 beats/min

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71 Which part of the circulatory system is mainly responsible for defending the body against infection?

- ☐ A) platelets
- ☐ B) plasma
- ☐ C) red blood cells
- ☐ D) white blood cells
- ☐ E) bile

---

72 What is the main job of the mitochondria?

- ☐ A) releasing energy from food in respiration
- ☐ B) strengthening and supporting a plant cell
- ☐ C) storing cell sap and keeping a plant cell firm
- ☐ D) controlling what enters and leaves the cell
- ☐ E) carrying out photosynthesis

---

73 Which organ is mainly responsible for storing urine?

- ☐ A) pancreas
- ☐ B) lungs
- ☐ C) brain
- ☐ D) oesophagus
- ☐ E) bladder

---

74 Which of these cell parts is found in plant cells but not in animal cells?

- ☐ A) cell membrane
- ☐ B) permanent vacuole
- ☐ C) cytoplasm
- ☐ D) mitochondria
- ☐ E) nucleus

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75 Which of these is NOT part of the circulatory system?

- [ ] A) arteries
- [ ] B) veins
- [ ] C) small intestine
- [ ] D) heart
- [ ] E) capillaries

---

76 A student measures her heart rate (beats per minute) at rest three times, getting 68, 72 and 70 bpm. Calculate the mean resting heart rate.

(1)

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77 Ella measures the resting pulse five times: 76, 83, 80, 84, 77 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 8 beats/min
- [ ] B) 800 beats/min
- [ ] C) 80 beats/min
- [ ] D) 400 beats/min
- [ ] E) 100 beats/min

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78 Which part of the circulatory system is mainly responsible for carrying dissolved nutrients, carbon dioxide and urea?

- [ ] A) plasma
- [ ] B) white blood cells
- [ ] C) capillaries
- [ ] D) the diaphragm
- [ ] E) arteries

---

79 What is the main job of the nucleus?

- [ ] A) releasing energy from food in respiration
- [ ] B) controlling the cell's activities and holding the genetic material
- [ ] C) storing cell sap and keeping a plant cell firm
- [ ] D) carrying out photosynthesis
- [ ] E) strengthening and supporting a plant cell

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80 Which organ is mainly responsible for pumping blood around the body?

- [ ] A) brain
- [ ] B) trachea (windpipe)
- [ ] C) lungs
- [ ] D) bladder
- [ ] E) heart

---

81 Which of these cell parts is found in plant cells but not in animal cells?

- [ ] A) ribosomes
- [ ] B) mitochondria
- [ ] C) cell membrane
- [ ] D) chloroplasts
- [ ] E) cytoplasm

---

82 Which of these is NOT part of the circulatory system?

- [ ] A) veins
- [ ] B) capillaries
- [ ] C) bladder
- [ ] D) heart
- [ ] E) arteries

---

83 A student measures her resting breathing rate three times and records 16, 18 and 17 breaths per minute. Calculate the mean resting breathing rate.

(1)

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84 Hana counts 10 breaths in 30 seconds while resting. Calculate the breathing rate in breaths per minute.

- [ ] A) 40 breaths/min
- [ ] B) 10 breaths/min
- [ ] C) 200 breaths/min
- [ ] D) 20 breaths/min
- [ ] E) 2 breaths/min

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85 Which part of the circulatory system is mainly responsible for carrying blood back to the heart?

- [ ] A) veins
- [ ] B) the diaphragm
- [ ] C) bile
- [ ] D) arteries
- [ ] E) white blood cells

---

86 What is the main job of the permanent vacuole?

- [ ] A) controlling what enters and leaves the cell
- [ ] B) storing cell sap and keeping a plant cell firm
- [ ] C) strengthening and supporting a plant cell
- [ ] D) hosting most of the cell's chemical reactions
- [ ] E) making proteins

---

87 Which organ is mainly responsible for making bile and breaking down harmful substances?

- [ ] A) small intestine
- [ ] B) appendix
- [ ] C) bladder
- [ ] D) gall bladder
- [ ] E) liver

---

88 Which of these cell parts is found in plant cells but not in animal cells?

- [ ] A) nucleus
- [ ] B) ribosomes
- [ ] C) cell wall
- [ ] D) cytoplasm
- [ ] E) mitochondria

---

89 What is the main job of the small intestine?

- [ ] A) carrying food from the mouth to the stomach
- [ ] B) carrying air to the lungs
- [ ] C) storing bile
- [ ] D) digesting food and absorbing digested nutrients into the blood
- [ ] E) absorbing water from undigested food

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90 Which of these is NOT part of the circulatory system?

- [ ] A) capillaries
- [ ] B) veins
- [ ] C) arteries
- [ ] D) heart
- [ ] E) liver

---

91 In cancer, cells divide uncontrollably, with the population doubling every few hours. Name the type of cell division responsible.

.....

.....

(1)

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92 A pupil's pulse is 80 beats per minute at rest and 160 beats per minute after exercise. Calculate the percentage increase in pulse rate.

- [ ] A) 100%
- [ ] B) 50%
- [ ] C) 1%
- [ ] D) 80%
- [ ] E) 200%

---

93 What is the main job of plasma?

- [ ] A) defending the body against infection
- [ ] B) carrying dissolved nutrients, carbon dioxide and urea
- [ ] C) helping the blood to clot
- [ ] D) carrying blood away from the heart at high pressure
- [ ] E) exchanging substances between the blood and the body cells

---

94 Which part of a cell is responsible for controlling what enters and leaves the cell?

- [ ] A) cell membrane
- [ ] B) ribosomes
- [ ] C) permanent vacuole
- [ ] D) chloroplasts
- [ ] E) mitochondria

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95 What is the main job of the stomach?

- ☐ A) storing bile
- ☐ B) carrying food from the mouth to the stomach
- ☐ C) digesting food and absorbing digested nutrients into the blood
- ☐ D) storing urine
- ☐ E) churning food and starting the digestion of protein

---

96 Which of these is part of the digestive system?

- ☐ A) nerves
- ☐ B) trachea (windpipe)
- ☐ C) oesophagus
- ☐ D) veins
- ☐ E) ureters

---

97 Calculate the approximate number of days in a 35-week pregnancy.

(1)

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98 What is the main job of capillaries?

- ☐ A) helping the blood to clot
- ☐ B) exchanging substances between the blood and the body cells
- ☐ C) defending the body against infection
- ☐ D) carrying blood away from the heart at high pressure
- ☐ E) carrying blood back to the heart

---

99 Which part of a cell is responsible for storing cell sap and keeping a plant cell firm?

- ☐ A) cytoplasm
- ☐ B) cell membrane
- ☐ C) cell wall
- ☐ D) chloroplasts
- ☐ E) permanent vacuole

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100 What is the main job of the oesophagus?

- [ ] A) carrying air to the lungs
- [ ] B) making bile and breaking down harmful substances
- [ ] C) carrying food from the mouth to the stomach
- [ ] D) storing bile
- [ ] E) storing urine

---

101 Which of these is NOT part of the respiratory system?

- [ ] A) lungs
- [ ] B) brain
- [ ] C) alveoli
- [ ] D) diaphragm
- [ ] E) trachea (windpipe)

---

102 Calculate the approximate number of days in a 32-week pregnancy.

(1)

---

103 Marcus measures the resting pulse five times: 68, 62, 70, 64, 66 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 55 beats/min
- [ ] B) 330 beats/min
- [ ] C) 660 beats/min
- [ ] D) 66 beats/min
- [ ] E) 82.5 beats/min

---

104 Which part of the circulatory system is mainly responsible for helping the blood to clot?

- [ ] A) platelets
- [ ] B) the diaphragm
- [ ] C) bile
- [ ] D) plasma
- [ ] E) white blood cells

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105 What is the main job of the cytoplasm?

- [ ] A) storing cell sap and keeping a plant cell firm
- [ ] B) releasing energy from food in respiration
- [ ] C) making proteins
- [ ] D) hosting most of the cell's chemical reactions
- [ ] E) controlling the cell's activities and holding the genetic material

---

106 Which organ is mainly responsible for absorbing water from undigested food?

- [ ] A) large intestine
- [ ] B) stomach
- [ ] C) trachea (windpipe)
- [ ] D) small intestine
- [ ] E) pancreas

---

107 Which of these is NOT part of the circulatory system?

- [ ] A) capillaries
- [ ] B) heart
- [ ] C) arteries
- [ ] D) veins
- [ ] E) bronchi

---

108 Which organelle in the cell controls all life processes and stores genetic information?

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

---

109 Chloe measures the resting pulse five times: 60, 66, 63, 59, 67 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 315 beats/min
- [ ] B) 63 beats/min
- [ ] C) 78.75 beats/min
- [ ] D) 52.5 beats/min
- [ ] E) 630 beats/min

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110 Which part of the circulatory system is mainly responsible for transporting oxygen around the body using haemoglobin?

- [ ] A) veins
- [ ] B) plasma
- [ ] C) platelets
- [ ] D) red blood cells
- [ ] E) arteries

---

111 What is the main job of the ribosomes?

- [ ] A) making proteins
- [ ] B) strengthening and supporting a plant cell
- [ ] C) hosting most of the cell's chemical reactions
- [ ] D) storing cell sap and keeping a plant cell firm
- [ ] E) controlling the cell's activities and holding the genetic material

---

112 Which organ is mainly responsible for carrying food from the mouth to the stomach?

- [ ] A) heart
- [ ] B) oesophagus
- [ ] C) gall bladder
- [ ] D) brain
- [ ] E) kidneys

---

113 An animal pregnancy lasts approximately 48 weeks. Assuming 1 month is approximately 4 weeks, calculate the length of this pregnancy in months.

(1)

---

114 Ella measures the resting pulse five times: 69, 67, 68, 66, 70 beats per minute. Calculate the mean resting pulse rate in beats per minute.

- [ ] A) 340 beats/min
- [ ] B) 85 beats/min
- [ ] C) 68 beats/min
- [ ] D) 680 beats/min
- [ ] E) 6.8 beats/min

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115 What is the main job of arteries?

- [ ] A) transporting oxygen around the body using haemoglobin
- [ ] B) carrying dissolved nutrients, carbon dioxide and urea
- [ ] C) exchanging substances between the blood and the body cells
- [ ] D) helping the blood to clot
- [ ] E) carrying blood away from the heart at high pressure

---

116 Which part of a cell is responsible for making proteins?

- [ ] A) ribosomes
- [ ] B) cytoplasm
- [ ] C) cell membrane
- [ ] D) cell wall
- [ ] E) permanent vacuole

---

117 Which organ is mainly responsible for digesting food and absorbing digested nutrients into the blood?

- [ ] A) kidneys
- [ ] B) small intestine
- [ ] C) brain
- [ ] D) liver
- [ ] E) oesophagus

---

118 Which of these is NOT part of the respiratory system?

- [ ] A) diaphragm
- [ ] B) bronchi
- [ ] C) capillaries
- [ ] D) trachea (windpipe)
- [ ] E) lungs

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119 Which part of an animal cell contains the ribosomes that make proteins?

- [ ] A) Cell membrane
- [ ] B) Mitochondrion
- [ ] C) Nucleus
- [ ] D) Cytoplasm

---

120 A person's heart beats 80 times per minute and pumps 70 cm^3 of blood with each beat. Calculate the cardiac output (blood pumped per minute) in dm3 per minute. (1 dm3 = 1000 cm^3.)

- [ ] A) 336 dm3/min
- [ ] B) 56 dm3/min
- [ ] C) 5.6 dm3/min
- [ ] D) 0.56 dm3/min
- [ ] E) 5600 dm3/min

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Mark scheme · 3.5 Biology: Cells, Body Systems and Reproduction: 2-hour Pack

Question 1

C (4.5 dm3/min) **B1**

Answer: C) 4.5 dm3/min

Question 2

A (the circulatory system) **B1**

Answer: A) the circulatory system

Question 3

B (5040 cm^3/min) **B1**

Answer: B) 5040 cm^3/min

Question 4

D (the respiratory system) **B1**

Answer: D) the respiratory system

Question 5

C (7500 cm^3/min) **B1**

Answer: C) 7500 cm^3/min

Question 6

A (bladder) **B1**

Answer: A) bladder

Question 7

B (77 beats/min) **B1**

Answer: B) 77 beats/min

Question 8

E (5600 cm^3/min) **B1**

Answer: E) 5600 cm^3/min

Question 9

E (stomach) **B1**

Answer: E) stomach

Question 10

B (5850 cm^3/min) **B1**

Answer: B) 5850 cm^3/min

Question 11

D (the digestive system) **B1**

Answer: D) the digestive system

Question 12

C (50%) **B1**

Answer: C) 50%

Question 13

A (the nervous system) **B1**

Answer: A) the nervous system

Question 14

A (62 beats/min) **B1**

Answer: A) 62 beats/min

Question 15

D (nerves) **B1**

Answer: D) nerves

Question 16

C (68 beats/min) **B1**

Answer: C) 68 beats/min

Question 17

B (the respiratory system) **B1**

Answer: B) the respiratory system

Question 18

E (10500 cm^3/min) **B1**

Answer: E) 10500 cm^3/min

Question 19

E (arteries) **B1**

Answer: E) arteries

Question 20

C (66 beats/min) **B1**

Answer: C) 66 beats/min

Question 21

D (the respiratory system) **B1**

Answer: D) the respiratory system

Question 22

A (6750 cm^3/min) **B1**

Answer: A) 6750 cm^3/min

Question 23

B (veins) **B1**

Answer: B) veins

Question 24

B (12 breaths/min) **B1**

Answer: B) 12 breaths/min

Question 25

D (the digestive system) **B1**

Answer: D) the digestive system

Question 26

E (65 beats/min) **B1**

Answer: E) 65 beats/min

Question 27

C (the nervous system) **B1**

Answer: C) the nervous system

Question 28

A (6000 cm^3/min) **B1**

Answer: A) 6000 cm^3/min

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Question 29

B (the excretory system) **B1**

Answer: B) the excretory system

Question 30

A (24 breaths/min) **B1**

Answer: A) 24 breaths/min

Question 31

D (the respiratory system) **B1**

Answer: D) the respiratory system

Question 32

C (5600 cm^3/min) **B1**

Answer: C) 5600 cm^3/min

Question 33

E (the nervous system) **B1**

Answer: E) the nervous system

Question 34

C (10800 cm^3/min) **B1**

Answer: C) 10800 cm^3/min

Question 35

E (the circulatory system) **B1**

Answer: E) the circulatory system

Question 36

A (8000 cm^3/min) **B1**

Answer: A) 8000 cm^3/min

Question 37

D (20%) **B1**

Answer: D) 20%

Question 38

(a) surface area = 6 x 2^2 = 24 mm^2 and volume = 2^3 = 8 mm^3 **M1**

(a) ratio = 3 : 1 (or 3) cao **A1**

(a) Answer: 3 : 1

(b) surface area = 6 x 4^2 = 96 mm^2 and volume = 4^3 = 64 mm^3 **M1**

(b) ratio = 1.5 : 1 (or 96:64 simplified) cao **A1**

(b) Answer: 1.5 : 1

(c) the smaller (2 mm) cell, because it has the larger surface area to volume ratio (3 : 1, compared with 1.5 : 1) **B1**

(c) a larger ratio means relatively more surface area is available, per unit of volume needing supply, for substances to diffuse across **B1**

(c) Answer: The 2 mm cell is more efficient, because its surface area to volume ratio (3:1) is larger than that of the 4 mm cell (1.5:1), so relatively more surface is available for diffusion for each unit of volume that needs supplying.

Question 39

E (bronchi) **B1**

Answer: E) bronchi

Question 40

C (10000 cm^3/min) **B1**

Answer: C) 10000 cm^3/min

Question 41

B (the digestive system) **B1**

Answer: B) the digestive system

Question 42

D (24 breaths/min) **B1**

Answer: D) 24 breaths/min

Question 43

A (the circulatory system) **B1**

Answer: A) the circulatory system

Question 44

B (40%) **B1**

Answer: B) 40%

Question 45

D (the respiratory system) **B1**

Answer: D) the respiratory system

Question 46

A (70 beats/min) **B1**

Answer: A) 70 beats/min

Question 47

E (small intestine) **B1**

Answer: E) small intestine

Question 48

C (30%) **B1**

Answer: C) 30%

Question 49

(a) number of doublings = 120 minutes / 20 minutes = 6 **M1**

(a) 2^6 (= 64), then multiplied by the starting number of cells: 5 x 64 **M1**

(a) 320 (cells) cao **A1**

(a) Answer: 320 cells

(b) mitosis **B1**

(b) Answer: Mitosis.

Question 50

D (ureters) **B1**

Answer: D) ureters

Question 51

B (6300 cm^3/min) **B1**

Answer: B) 6300 cm^3/min

Question 52

E (20 breaths/min) **B1**

Answer: E) 20 breaths/min

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Question 53

C (alveoli) **B1**

Answer: C) alveoli

Question 54

B (30%) **B1**

Answer: B) 30%

Question 55

E (bladder) **B1**

Answer: E) bladder

Question 56

A (Nucleus) cao **B1**

Answer: A) Nucleus

Question 57

D (80 beats/min) **B1**

Answer: D) 80 beats/min

Question 58

C (capillaries) **B1**

Answer: C) capillaries

Question 59

E (controlling what enters and leaves the cell) **B1**

Answer: E) controlling what enters and leaves the cell

Question 60

C (trachea (windpipe)) **B1**

Answer: C) trachea (windpipe)

Question 61

A (cell wall) **B1**

Answer: A) cell wall

Question 62

D (alveoli) **B1**

Answer: D) alveoli

Question 63

Mitosis (oe) **B1**

Answer: Mitosis

Question 64

E (65 beats/min) **B1**

Answer: E) 65 beats/min

Question 65

B (arteries) **B1**

Answer: B) arteries

Question 66

C (carrying out photosynthesis) **B1**

Answer: C) carrying out photosynthesis

Question 67

D (permanent vacuole) **B1**

Answer: D) permanent vacuole

Question 68

B (nerves) **B1**

Answer: B) nerves

Question 69

Day 1 (oe) **B1**

Answer: Day 1

Question 70

A (64 beats/min) **B1**

Answer: A) 64 beats/min

Question 71

D (white blood cells) **B1**

Answer: D) white blood cells

Question 72

A (releasing energy from food in respiration) **B1**

Answer: A) releasing energy from food in respiration

Question 73

E (bladder) **B1**

Answer: E) bladder

Question 74

B (permanent vacuole) **B1**

Answer: B) permanent vacuole

Question 75

C (small intestine) **B1**

Answer: C) small intestine

Question 76

70 beats per minute (oe) **B1**

Answer: 70 beats per minute

Question 77

C (80 beats/min) **B1**

Answer: C) 80 beats/min

Question 78

A (plasma) **B1**

Answer: A) plasma

Question 79

B (controlling the cell's activities and holding the genetic material) **B1**

Answer: B) controlling the cell's activities and holding the genetic material

Question 80

E (heart) **B1**

Answer: E) heart

Question 81

D (chloroplasts) **B1**

Answer: D) chloroplasts

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Question 82

C (bladder) **B1**

Answer: C) bladder

Question 83

17 breaths per minute (oe) **B1**

Answer: 17 breaths per minute

Question 84

D (20 breaths/min) **B1**

Answer: D) 20 breaths/min

Question 85

A (veins) **B1**

Answer: A) veins

Question 86

B (storing cell sap and keeping a plant cell firm) **B1**

Answer: B) storing cell sap and keeping a plant cell firm

Question 87

E (liver) **B1**

Answer: E) liver

Question 88

C (cell wall) **B1**

Answer: C) cell wall

Question 89

D (digesting food and absorbing digested nutrients into the blood) **B1**

Answer: D) digesting food and absorbing digested nutrients into the blood

Question 90

E (liver) **B1**

Answer: E) liver

Question 91

Mitosis (oe) **B1**

Answer: Mitosis

Question 92

A (100%) **B1**

Answer: A) 100%

Question 93

B (carrying dissolved nutrients, carbon dioxide and urea) **B1**

Answer: B) carrying dissolved nutrients, carbon dioxide and urea

Question 94

A (cell membrane) **B1**

Answer: A) cell membrane

Question 95

E (churning food and starting the digestion of protein) **B1**

Answer: E) churning food and starting the digestion of protein

Question 96

C (oesophagus) **B1**

Answer: C) oesophagus

Question 97

245 days (oe) **B1**

Answer: 245 days

Question 98

B (exchanging substances between the blood and the body cells) **B1**

Answer: B) exchanging substances between the blood and the body cells

Question 99

E (permanent vacuole) **B1**

Answer: E) permanent vacuole

Question 100

C (carrying food from the mouth to the stomach) **B1**

Answer: C) carrying food from the mouth to the stomach

Question 101

B (brain) **B1**

Answer: B) brain

Question 102

224 days (oe) **B1**

Answer: 224 days

Question 103

D (66 beats/min) **B1**

Answer: D) 66 beats/min

Question 104

A (platelets) **B1**

Answer: A) platelets

Question 105

D (hosting most of the cell's chemical reactions) **B1**

Answer: D) hosting most of the cell's chemical reactions

Question 106

A (large intestine) **B1**

Answer: A) large intestine

Question 107

E (bronchi) **B1**

Answer: E) bronchi

Question 108

C (Nucleus) cao **B1**

Answer: C) Nucleus

Question 109

B (63 beats/min) **B1**

Answer: B) 63 beats/min

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Question 110

D (red blood cells) **B1**

Answer: D) red blood cells

Question 111

A (making proteins) **B1**

Answer: A) making proteins

Question 112

B (oesophagus) **B1**

Answer: B) oesophagus

Question 113

12 months (oe) **B1**

Answer: 12 months

Question 114

C (68 beats/min) **B1**

Answer: C) 68 beats/min

Question 115

E (carrying blood away from the heart at high pressure) **B1**

Answer: E) carrying blood away from the heart at high pressure

Question 116

A (ribosomes) **B1**

Answer: A) ribosomes

Question 117

B (small intestine) **B1**

Answer: B) small intestine

Question 118

C (capillaries) **B1**

Answer: C) capillaries

Question 119

D (Cytoplasm) cao **B1**

Answer: D) Cytoplasm

Question 120

C (5.6 dm3/min) **B1**

Answer: C) 5.6 dm3/min

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