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|  | **Year 11 ATAR Human Biology**  **Task 4 – Respiratory, circulatory and digestive systems** |

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| --- | --- | --- | --- |
| **Name:** | **Teacher:** | **Date:** | **Score: /60** |

**Assessment type:** Test

**Conditions**

Time for the task: 60 minutes

**Task weighting** – 5%

Total 60 marks

|  |  |  |
| --- | --- | --- |
| **Sections** | **Marks Allocation** | **Your Total** |
| **1 – Multiple Choice** | **10** |  |
| **2 – Short Answer** | **36** |  |
| **3 – Extended Response** | **14** |  |
| **TOTAL** | **60** |  |

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**Section 1: Multiple-choice (10 marks)**

This section has 10 questions. Answer all questions by writing the letter corresponding to the correct answer in the box provided.

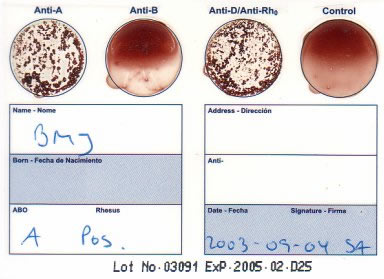
1. Use the diagram below to answer the following question.



Which of the following correctly identifies the three different formed elements of blood shown in the diagram above?

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| a) | Erythrocytes | Platelets | Leukocytes |
| b) | Leukocytes | Platelets | Erythrocytes |
| c) | Platelets | Plasma | Erythrocytes |
| d) | Leukocytes | Erythrocytes | Plasma |

1. In the case of transport of carbon dioxide in the blood, which of the following is correct?
2. It is transported bound to haemoglobin only.
3. It is transported bound to haemoglobin and dissolved in the plasma only.
4. It is transported bound to haemoglobin, dissolved in the plasma, and as Hydrogen Carbonate ion.
5. It is transported as Hydrogen carbonate ion and dissolved in the plasma only.

The next question refers to the diagram below, showing the results of a blood test. The control shows a negative result.

1. The individual shown above has the blood type
2. A positive
3. B positive
4. A negative
5. B negative
6. The air tubes in the lungs that do not have a mucous membrane with cilia are called the
7. primary bronchi
8. tertiary bronchi
9. secondary bronchi
10. bronchioles
11. In the case of ventilation, the process of breathing in and out respectively is called
12. expiration and inspiration.
13. inspiration and expiration.
14. inspiration and expulsion.
15. expulsion and expiration.
16. During inspiration the volume of the lungs
17. decreases.
18. stays the same.
19. increases.
20. increases and decreases.
21. Which of the following statements concerning arteries and veins is correct?
22. Veins are usually rich in oxygen but most arteries carry oxygen-poor blood.
23. Arteries are highly elastic and have more muscular walls than veins.
24. Arteries have a low blood pressure but veins have a high blood pressure.
25. Veins carry blood away from the heart but arteries return blood to the heart.
26. The series of muscular contractions that moves food along the digestive tract is called
27. periosteum.
28. peristalsis.
29. pericardium.
30. perimysium.

1. Through what process do the villi absorb amino acids into the blood capillaries?
2. Endocytosis.
3. Diffusion.
4. Osmosis.
5. Active transport.
6. Which of the following relate to the structure of lipids?
7. High or low density.
8. Saturated, unsaturated and trans fats.
9. Made up of glycerol and fatty acids.
10. All of the above.

**End of Part A**

**Section 2: Short answer (36 marks)**

This section has three questions. Answer all questions. Write your answers in the spaces provided.

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**Question 11 (15 marks)**

Parts a, b, and c of the question refer to the diagram of the heart below.



1. Identify the structures labelled ‘W’ and ‘Z’.

W: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Z: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2 marks)

1. Describe the role of the structure labelled ‘V’ on the diagram.

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(1 mark)

1. Explain why chamber Z has a thicker wall than the chamber on the opposite side of the heart.

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(1 mark)

1. Describe where the blood goes and what happens to it once it exits the right ventricle up until the point it enters the left atrium.

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(4 marks)

1. Compare the vessels labelled ‘X’ and ‘Y’ by completing the table below.

|  |  |  |
| --- | --- | --- |
|  | **Vessel X** | **Vessel Y** |
| **Structure** |  |  |
| **Function** |  |  |

(4 marks)

1. Describe three events in the process of blood clotting.

One: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Two: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Three: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(3 marks)

**Question 12 (13 marks)**

Parts a, b and c of this question refer to the diagram below, which represents the respiratory system.



1. Identify the structure labelled ‘A’ and state its function.

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(2 marks)

1. The structure labelled ‘B’ assists in the process of inspiration. Describe how Structure B assists the movement of air into the lungs.

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(4 marks)

The diagram below illustrates the structure that lies at the end of Structure C.



1. Complete the table below, identifying the name and function of the structures shown in the diagram.

|  |  |  |
| --- | --- | --- |
|  | **Name of structure** | **Function** |
| X |  |  |
| Y |  |  |

(4 marks)

1. List three structural features that assist Structure X in achieving its function in the body.

One: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Three: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(3 marks)

**Question 13 (8 marks)**

Lung capacity is measured by a simple breathing test using a spirometer. It measures the total amount of air that a person breathes in and out, giving an indication of lung capacity. Lung capacity is determined on many factors, but a person in good health will generally have a larger lung capacity than a person in poor health.

A study was conducted of the effects of exercise on lung capacity. Participants in the study were divided into two groups of nine. All participants were males aged between 18 and 30 years. Participants in group A were on an exercise program which involved regular running and swimming workouts. The participants in Group B were told not to change their daily physical activity from what they were already doing. Over a six-week period, the lung capacity of each participant was measured weekly with a spirometer and averaged for the groups. Shown below is a table of the results from the experiment.

|  |  |  |
| --- | --- | --- |
| **Time**  **(weeks)** | **Average lung capacity (litres)** | |
| **Group A** | **Group B** |
| 0 | 5.5 | 5.0 |
| 1 | 5.5 | 5.0 |
| 2 | 5.8 | 5.2 |
| 3 | 6.0 | 5.2 |
| 4 | 6.0 | 5.5 |
| 5 | 6.5 | 5.5 |
| 6 | 7.0 | 5.5 |

1. Propose a hypothesis for this experiment.

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(1 mark)

1. Identify:

(i) The independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(1 mark)

(ii) The dependent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(1 mark)

(iii) Two variables that were controlled in the experiment:

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(2 marks)

1. If the researchers were aiming to improve the **reliability** of the experiment, suggest one change they could make to the experiment.

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(1 mark)

1. Further experiments were undertaken on different factors affecting lung capacity. What effect would you expect the lifestyle choice of smoking cigarettes would have on lung capacity? Justify your answer.

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(2 marks)

**End of Part B**

**Section 3: Extended answer (14 marks)**

This section has one question. Write your answers in the spaces provided.

**Question 15**

1. Outline the mechanical digestion of the fat found on a piece of bacon.

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(6 marks)

1. Describe the features of the small intestine that maximise the process of absorption.

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(5 marks)

1. Why are people who suffer from coeliac disease likely to become malnourished?

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(3 marks)

**END OF TEST**