**ATAR HUMAN BIOLOGY – UNIT 1**

**TASK 2 – CIRCULATORY AND RESPIRATORY SYSTEMS TEST**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 5%**

**DUE DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_\_\_ /58 = \_\_\_\_\_\_ %**

Important Information for Students

1. There are THREE sections in this test - Multiple Choice, Short Answer and Extended Answer.
2. This is a closed-book assessment (no notes are allowed)
3. The time allowed to complete the test is 60 minutes.
4. Write your answers to the Multiple Choice section on the **separate** answer sheet provided. Circle only 1 answer.
5. Write your answers to the Short Answer section in space provided.
6. Write your answers to the Extended Answer section in space provided

|  |  |  |
| --- | --- | --- |
| Sections | **Marks Allocation** | **Your Total** |
| **A - Multiple Choice** | 12 |  |
| **B - Short Answer** | 36 |  |
| **C - Extended Answer** | 10 |  |
| **TOTAL** | **58** |  |

**Multiple Choice Answer Sheet**

Answer all questions by placing a circle around the correct letter.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

***MULTIPLE CHOICE SECTION [TOTAL = 12 MARKS]***

1. Referring to blood vessels in the human body, which statement is always TRUE?

a. Arteries carry deoxygenated blood, veins carry oxygenated blood

b. Arteries carry oxygenated blood, veins carry deoxygenated blood

c. Arteries carry blood towards the heart; veins carry blood away from the heart

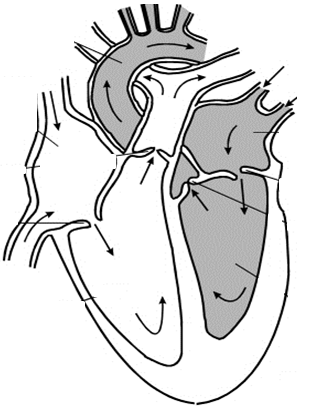
d. Arteries carry blood away from the heart; veins carry blood towards the heart

1. Wastes removed during expiration include:
   1. Water, ammonia and carbon dioxide
   2. Salt, urea and oxygen
   3. Carbon dioxide, water and nitrogen
   4. Ammonia, nitrogen and water
2. The trachea contains cells that have cilia. What is the function of the cilia?
   1. To give shape to the trachea
   2. To help move the gases to and from the lungs
   3. To move mucus and trapped particles out
   4. To increase the surface area of the trachea
3. Exchange of nutrients and waste material between the blood and cells occurs through the:
   1. Lymph
   2. Intercellular fluid
   3. Lymphatic vessels
   4. Intracellular fluid
4. Which of the following statements is NOT true:
   1. The need for oxygen in the body causes inspiration
   2. Oxygen is carried in the blood as oxyhaemoglobin
   3. Capillaries are only one cell thick
   4. Oxygen passes from the alveoli by diffusion
5. Which one of the following is NOT a function of the lymphatic system?
6. Lymphocyte production
7. Trapping of foreign antigens
8. Transports wastes to the kidney
9. Recirculation of body fluids back into the circulatory system
10. The ventricular wall is thicker than the arterial wall so that it can:
11. Receive more blood
12. Oxygenate the blood faster
13. Control the volume of blood pumped
14. Exert a greater force when pumping blood
15. Air exits out lungs because atmospheric pressure is:
    1. Greater than the pressure inside the lungs because the volume of the lungs has become smaller
    2. Less than the pressure inside the lungs because the volume of the lungs has become larger
    3. Greater than the pressure inside the lungs because the volume of the lungs has become larger
    4. Less than the pressure inside the lungs because the volume of the lungs has become smaller
16. As blood enters the capillaries, the relatively high pressure forces some of the fluid in the blood in through the capillary walls into the tissues. How is this fluid returned to the heart?
    1. The effect of gravity on the body returns the fluid to the heart
    2. Osmosis returns the fluid to the heart
    3. Combination of contracting muscles and valved vessels of the lymphatic system
    4. Fibrin and serum capture the fluid and return it to the heart
17. If a person has a heart rate of 70 beats per minute and a cardiac output of 1400ml per minute then their stroke volume would be:
18. 20mls
19. 200mls
20. 100mls
21. 70mls
22. Which of the following is true of gaseous exchange through the walls of the alveoli?
23. Net diffusion of oxygen is from the alveoli to the blood capillaries.
24. Diffusion of carbon dioxide occurs at the same rate in both directions.
25. Net diffusion of carbon dioxide is from the alveoli to the blood capillaries.
26. Diffusion of oxygen occurs at the same rate in both directions.
27. Arteriosclerosis can cause which of the following?
28. Asthma
29. Angina
30. Emphysema
31. Bronchitis

***SHORT ANSWER SECTION [TOTAL = 36 MARKS]***

This section has **nine** questions. Answer all questions in the spaces provided.

1. Below is a cross-sectional diagram of a human heart



II

V

III

I

IV

1. Label the following structures: [2 marks]  
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Compare the structure and function of vessel **II** with structure and function of the vessels entering part **V**. [2 marks]

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c. Explain what would happen to structures I and IV during diastole and atricular systole. [1 mark]

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1. Some individuals have additional fat deposits on the inside of their blood vessels. Explain the effect this would have on the individual’s blood pressure and why this would occur? [2 marks]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Sometimes babies can be born with a hole connecting the two atria of the heart. Using your knowledge of the circulatory system, explain why a ‘hole in the heart’ is a serious problem. [2 marks]

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1. Both the lymphatic and circulatory system carry fluids around the human body. Briefly describe

two (2) features of the lymphatic system that differ to the circulatory. [2 marks]

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1. In the space below, draw a diagram with annotations (notes) explaining what happens to the chest cavity during inspiration. [4 marks]

1. Below is a table that shows the proportion of oxygen and carbon dioxide and how it is transported in blood

|  |  |
| --- | --- |
| **OXYGEN** | **CARBON DIOXIDE** |
| 3% Dissolved in plasma | 8% dissolved in plasma |
| **I.** | **II.** |
|  | 70% as Bicarbonate ions |

* 1. Fill in the missing forms of transport from the above table. [2 marks]  
     1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. Bicarbonate ions are the product of a chemical reaction within the body. Explain how these ions are formed. [2 marks]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Fill in the table below [5 marks]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **FORMED ELEMENTS** | | | **LIQUID PART** |
| **Red Blood Cell** | **White Blood Cell** | **Platelet** | **Plasma** |
| **SCIENTIFIC NAME** |  |  |  |  |
| **ROLE IN THE BODY** |  |  |  |  |
| **LIFESPAN** |  |  |  |  |

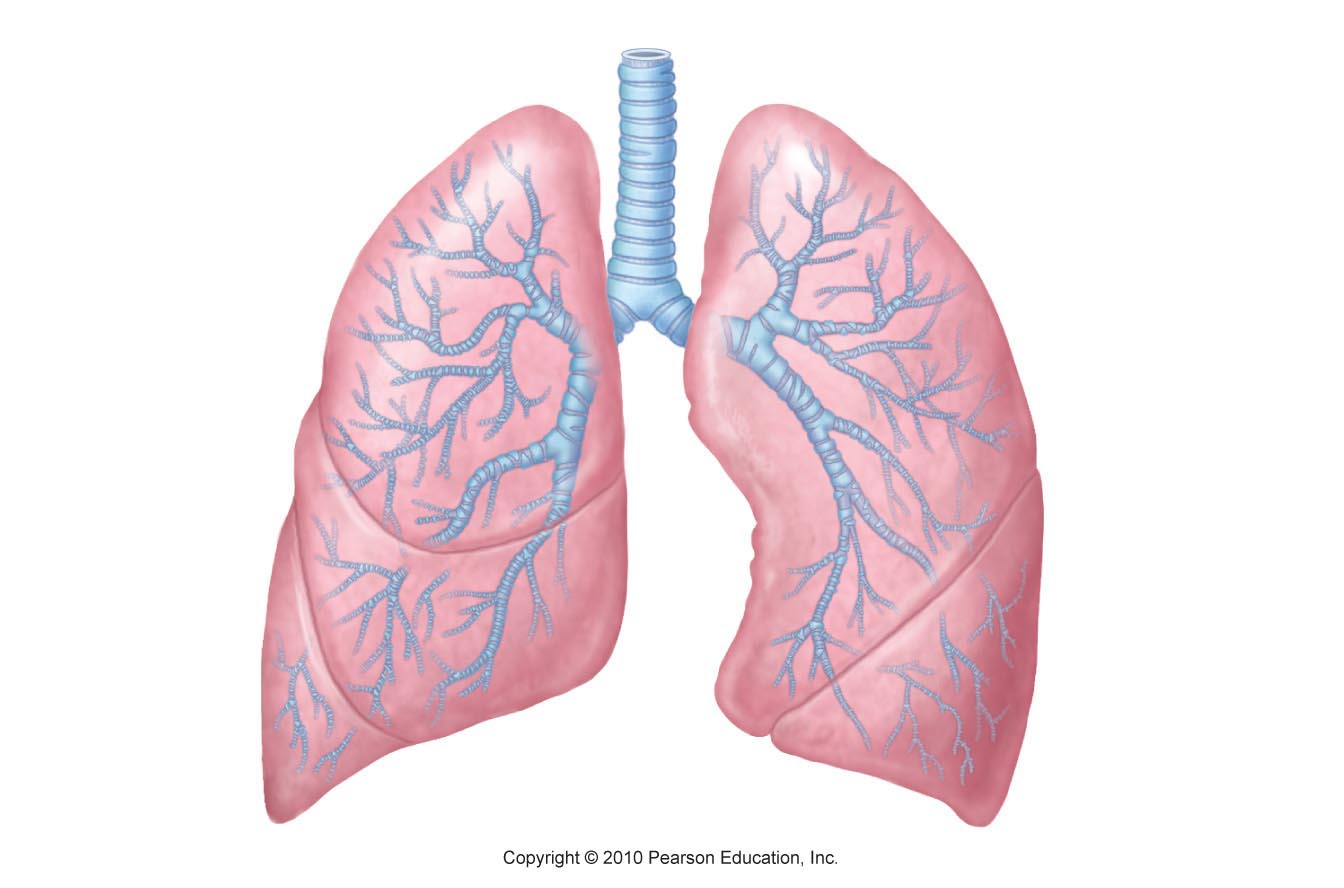
1. Anaemia is a condition where the body is low in Iron. Anaemics (people with anaemia) often complain of being tired and become exhausted easily despite having a good night’s sleep.
   1. Explain what is occurring in an anaemics body. [4 marks]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Describe the main events that occur during blood clotting. [3 marks]

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Below is a diagram of the internal structure of the lungs.



1. The lung is a very good example of a surface which enables exchange of materials to occur efficiently in the human body.
2. Name any two (2) features of the lungs and describe how they are suited to their role in gas exchange [2 marks]

i. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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ii. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. The trachea and bronchi have C-shaped cartilage surrounding them. What is the purpose of the cartilage? [1 mark]

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1. A person is involved in a crash accident, out on the Eyre Highway. Because he is losing blood fast the paramedics decide to he needs to be given blood to replace what he has lost. Unfortunately, the person is unable to talk and cannot tell paramedics what blood group he has.   
   What blood could he be given and describe why. [2 marks]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***EXTENDED ANSWER SECTION [TOTAL = 10 MARKS]***

22. Haemolytic disease in the second born child occurs when the red blood cells of the child are destroyed by antibodies produced by the mother. This problem comes about when the Rhesus positive red blood cells of the child cross the placenta into the mother’s circulatory system that contains Rhesus negative blood type.

1. Using your knowledge of blood groups, describe:

* How the mother would develop antibodies against her own child’s blood
* What effect the production of rhesus anti bodies would have on the health of the first born child.
* What effect the production of antibodies would have on the second child. [8 marks]

1. Explain what measures the mother could take to avoid haemolytic disease in the second born.

[2 marks]

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***END OF TEST***