

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Mark= /52

HUMAN BIOLOGICAL SCIENCE. YEAR 12. 2013.

Homeostasis, Disruption to Homeostasis and Movement Through the Cell Membrane Test.

***Multiple choice answer sheet.***

**Use a ball point or ink pen to mark an X** on the letter that represents the best answer from the choice of answers . Marks are not deducted for wrong answers.

|  |  |
| --- | --- |
| Question | Answer |
| 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 |
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| 7 | A B C D |
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| 10 | A B C D |
| 11 | A B C D |
| 12 | A B C D |
| 13 | A B C D |
| 14 | A B C D |
| 15 | A B C D |
| 16 | A B C D |
| 17 | A B C D |
| 18 | A B C D |
| 19 | A B C D |
| 20 | A B C D |

1. If a cell’s cytoplasm contains 30% solute, which of the following best describes the rest of the cytoplasm?
2. 70% solute
3. 30% solute.
4. 70% solvent.
5. 30% solvent.
6. An athlete found that after starting to run for a few minutes that she began to sweat. What other changes would be occurring at the same time?
7. Vasodilatation of blood vessels leading to the gut.
8. Vasodilatation of blood vessels near the skin surface.
9. A decrease in lipolysis.
10. An increase in blood pH.
11. It has been observed that after drinking alcohol, the volume of urine produced increases. Which of the following statements correctly explains this observation?
12. Alcohol inhibits the secretion of ADH form the pituitary gland and as a result increases permeability of the distil convoluted tubule of the nephron to water.
13. Alcohol inhibits the secretion of ADH form the pituitary gland and as a result decreases the permeability of the distil convoluted tubule of the nephron to water.
14. Alcohol increases the secretion of ADH form the pituitary gland and as a result increases permeability of the distil convoluted tubule of the nephron to water.
15. Alcohol increases the secretion of ADH form the pituitary gland and as a result increases permeability of the distil convoluted tubule of the nephron to water.
16. Protein deamination
17. Occurs in the pancreas and the waste products are filtered at the bladder.
18. Occurs in the kidneys and the waste products are filtered at the bladder.
19. Occurs in the liver and the waste products are filtered at the kidneys.
20. Occurs in the large intestine and the waste products are filtered at the liver.
21. Hyperventilation is dangerous because
22. It causes a rapid decrease in blood pH.
23. It causes a decrease in the stimulation of receptors of cardiac center.
24. It causes an over stimulation of the cardiac center.
25. It causes a decrease in the stimulation of receptors of the respiratory center.
26. Which of the following is not a benefit of HRT?
27. Reduction of hot flushes.
28. Reduction of night sweats.
29. Restoration of the vagina’s elasticity.
30. Reduction in sensitivity to light.
31. Damage to the beta cells of the Islets of Langerhans would cause a decrease in
32. Adrenalin production
33. Nor adrenalin production
34. Insulin production
35. Glucagon production
36. An increase in the levels of lactic acid in muscle tissue would result in:
37. Sympathetic nerve fibers sending impulses along pathways in the spinal cord to the heart.
38. Sympathetic nerve fibers sending impulses along the vagus nerve to the heart...
39. Parasympathetic nerve fibers sending impulses along pathways in the spinal cord to the heart.
40. Parasympathetic nerve fibers sending impulses along the vagus nerve to the heart.
41. A shorter diastole will result in
42. Reduced stroke volume
43. Increased stroke volume
44. Increased heart rate
45. Reduced heart rate.
46. Which of the following pairs of structures both contain receptors for the cardiac output?
47. Islets of Langerhans and medulla.
48. Groin and carotid artery.
49. Groin and medulla.
50. Aorta and carotid artery.
51. Jim has a cardiac output of 7000mL/minute and a stroke volume of 70mL/beat. What is his heart rate?
52. 100 bpm.
53. 4900bpm.
54. 140bpm.
55. 10 bpm.
56. Bob has two beakers of water. Beaker A contains two liters of water. Beaker B contains one liter of water. To beaker A Bob adds 10 grams of salt. To beaker B Bob adds 15 grams of salt. From this information you can state that:
57. Beaker A has the highest osmotic potential.
58. Beaker B has the highest osmotic potential.
59. Beaker B is the most dilute solution.
60. Beaker B has the most solvent.
61. Two beakers (Beaker A and Beaker B) are placed next to each other. Beaker A contains a salt solution that is hypotonic in solute concentration compared to Beaker B. A water filled tube is used to connect both beakers. Which of the following describes what would happen once the beakers have been connected by the tube?
62. Solute particle would move from Beaker A to Beaker B until Beaker A becomes hypertonic in comparison to Beaker B.
63. Solute particles will move from Beaker B to Beaker A until both beakers contain isotonic solutions.
64. Solute particles will move from Beaker A to Beaker B until both beakers contain isotonic solutions.
65. There will be no net movement of solvent particles.
66. Emphysema can best be described as:
67. A reduction in the number of alveoli and a decrease in the volume of individual Alveoli.
68. A reduction in the number of alveoli, but an increase in the volume of individual alveoli.
69. A reduction in the number of bronchioles and a decrease in the volume of individual Alveoli.
70. A reduction in the number of alveoli and a decrease in the volume of individual bronchioles.
71. Which of the following is not a function of a protein?
72. Transport across membranes.
73. Enzyme control of cell metabolism.
74. Cell and tissue structure.
75. Acting as solvents in ion transfer.
76. A cell moves some solid matter into itself by engulfing the matter with some of its membrane. This is an example of:
77. Exocytotic pinocytosis.
78. Exocytotic phagocytosis.
79. Endocytotic pinocytosis.
80. Endocytotic phagocytosis.
81. An injection of adrenalin directly into the heart will cause:
82. Vasoconstriction of blood vessels.
83. An increase in cardiac output.
84. A decrease in cardiac output.
85. A reduction in Sino arterial node impulse rate.
86. Alcohol will cause disruption to a number of homeostatic systems in the body. Which of the following are examples of the disruption that alcohol causes?
87. An increase in the conversion of glucose to glycogen. A decrease in ADH production resulting in an increase in urine volume and a decrease in urine concentration.
88. An increase in the conversion of glucose to glycogen. A decrease in ADH production resulting in a decrease in urine volume and an increase in urine concentration.
89. A drop in blood glucose levels. An increase in ADH production resulting in an increase in urine volume and an increase in urine concentration.
90. Vasoconstriction of blood vessels near the skin surface. An increase in heat retention.
91. Which of the following is an example of **hormonal** disruption to homeostasis?
92. Diabetes.
93. Emphysema.
94. Caffeine.
95. Fever.
96. Which of the following hormones are in the combined oral contraceptive pill?
97. L.H. and F.S.H.
98. L.H. and Oestrogen.
99. Testosterone and Oestrogen.
100. Oestrogen and Progesterone.

Short answer section. 32 marks

1. A. List 4 risk factors for the development of Type 2 diabetes.

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(2marks)

1. A biologist is studying life in Antarctica, where the average daily temperature is -500C. His work requires him to be in the open air making observations for long periods of time.
2. Describe one (1) behavioural modification he would need to make, apart from wearing warmer clothing, when outside observing animals.

(1 mark)

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1. Physiological mechanisms are also essential for the scientist to maintain his core temperature in these freezing conditions.

Some of these are nervous control and other are controlled by the endocrine system.

1. Name two (2) mechanisms that his nervous system would control and explain how they would maintain his core temperature.

(2 marks)

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1. What is the modulator for the control of core body temperature?

(1 mark)

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1. Two other biologists are studying other animal species in completely different conditions to that in Antarctica. One is in a hot desert and the other in a tropical rainforest. Both climates have a similar average daily temperature of 340C. However, the biologist in the desert feels reasonably comfortable at his temperature whereas the one in the tropical rainforest finds it very uncomfortable. Explain why.

(1 mark)

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

1. After a period of time without drinking, the blood volume of the scientist working in the desert would change more than that of the scientist in the tropical rainforest.
2. Describe what would change that would occur to scientist in the desert.

(1 mark)

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

1. Explain your answer to part d. (I).

(1 mark)

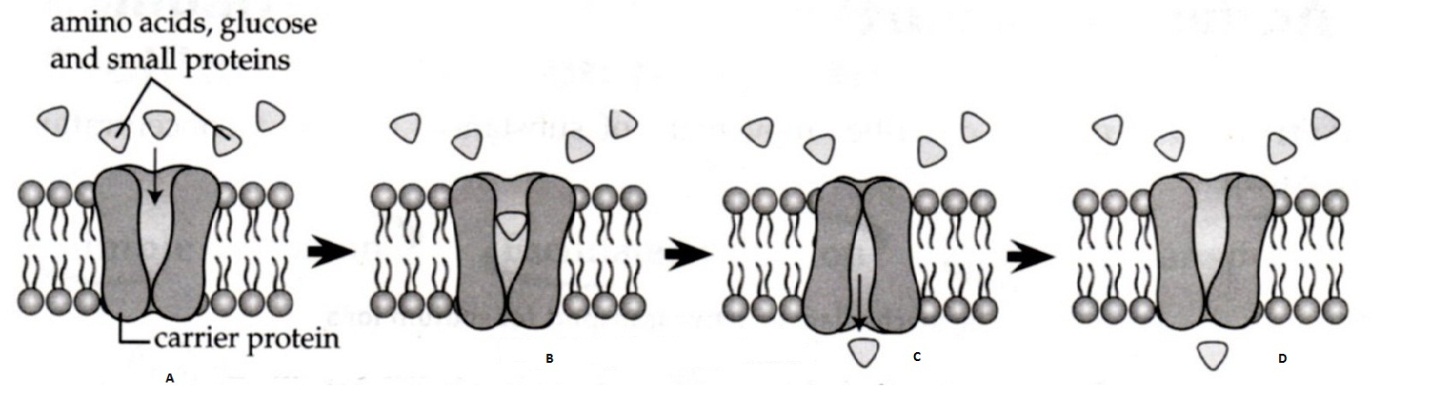
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1. How would this affect his blood pressure?

(2 marks)

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1. Look the diagram below. The small amino acids being moved are moving against the concentration gradient. Explain what is happening.



(5 marks)

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1. A. Exocytosis and endocytosis can move materials through the plasma membrane. How are the two processes similar and how are they different. You may choose to use a diagram to answer this.

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(3 marks)

B. Endocytosis can be further divided into two forms. What are these two forms called and how do they differ?

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(2 marks)

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| --- |
| STIMLUS |
|  |

1. Complete the table below for the control of body temperature if the external temperature has caused a slight **decrease** in core body temperature. (7marks)

|  |
| --- |
| FEEDBACK |
|  |

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| --- |
| RECEPTOR/S |
|  |

|  |
| --- |
| RESPONSE |
|  |

|  |
| --- |
| MODULATOR |
|  |

|  |
| --- |
| EFFECTOR/s |
|  |

1. While studying the cell membrane a student found that water molecules would not move through the phospholipid bilayer. With reference to the structure of the bilayer explain this.

(2 marks)

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

b. How would water molecules get through the cell membrane?

(2 mark)

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