2015 Homeostasis, Disruption to Homeostasis and Fossils Test

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Test part | Possible mark | Your mark |
| Multiple choice | 25 |  |
| Short answer | 29 |  |
| Total | 54 |  |

**Use a ball point pen to shade** the letter that represents the best answer from the choice of answers. Marks are not deducted for wrong answers.

|  |  |  |  |
| --- | --- | --- | --- |
| Question | Answer | Question | Answer |
| 1 | A B C D | 16 | A B C D |
| 2 | A B C D | 17 | A B C D |
| 3 | A B C D | 18 | A B C D |
| 4 | A B C D | 19 | A B C D |
| 5 | A B C D | 20 | A B C D |
| 6 | A B C D | 21 | A B C D |
| 7 | A B C D | 22 | A B C D |
| 8 | A B C D | 23 | A B C D |
| 9 | A B C D | 24 | A B C D |
| 10 | A B C D | 25 | 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 |  |  |

Multiple Choice

1. Vasodilation of blood vessels near the skin will occur when:

a. the core body temperature is too high.

b. the core body temperature is too low.

c. the atmospheric temperature is too low.

d. the blood glucose level is too high.

2. A sudden change in core body temperature:

a. will disrupt metabolic activity as it alters enzyme activity.

b. will increase Carbon dioxide solubility in blood plasma.

c. will always decrease sweating.

d. will increase metabolic rate in order to cool the body.

3. Dynamic equilibrium is best described as:

1. Unchanging and ideal conditions.
2. Maintenance of conditions within an acceptable range of limits. Some fluctuation occurs, but conditions remain within the limits.

c. Maintenance of conditions beyond an acceptable range of limits. Some fluctuation occurs, but conditions remain within the limits.

d. Maintenance of conditions within an acceptable range of limits. No fluctuation of conditions occurs.

1. Homeostasis is maintained by:
2. The endocrine system.
3. Behaviour.
4. The nervous system.
5. All of the above.

5. Homeostasis is the

a. lowering of body temperature by sweating.

b. secretion of hormones from endocrine glands.

c. excretion of nitrogenous wastes in urine.

d. maintenance of a constant internal environment.

6. Hypothyroidism:

(a) is a result of an overactive thyroid gland.

(b) results in an enlarged thyroid gland.

(c) would be treated by the surgical removal of part of the thyroid.

(d) results in fatigue and extreme weight loss.

7. How is the control of cardiac muscle unique?

(a) It is not affected by the action of hormones.

(b) It can initiate its own contractions.

(c) It only involves nervous control.

(d) It is controlled by adrenalin.

8. The functional unit of the kidney is the:

(a) neuron.

(b) nephron.

(c) neutron.

(d) axon

9. Thermorecptors are located in the

(a) abdominal organs

(b) hypothalamus.

(c) skin.

(d) all of the above

10. Consumption of alcohol will:

(a) increase urine volume and decrease urine concentration.

(b) increase urine concentration and decrease urine volume.

(c) decrease urine volume and decrease urine concentration.

(d) will have no impact on kidney function.

11. Carbon dioxide concentration in the blood:

(a) will increase with an increase in physical activity and cause a drop in plasma pH.

(b) will decrease with an increase in physical activity and cause a drop in plasma pH.

(c) will increase with an increase in physical activity and cause increasing plasma pH.

(d) Carbon dioxide is not transported by the circulatory system.

12. Fever:

(a) is a disease.

(b) is reduced by vasoconstriction in arterioles of the skin.

(c) can be increased by radiation from the skin on a very hot day.

(d) may help the immune system overcome infection.

13. Carbon dating :

(a) is a form of absolute dating.

(b) is a from of relative dating.

(c) uses tree rings to calculate the age of an artefact.

(d) Works best on inorganic matter.

14. Which of the following is a correct statement?

(a) The pancreas secretes glucagon to reduce blood glucose levels.

(b) Parathyroid gland secretes glucagon to control glucose levels in the blood.

(c) The Islets of Langerhans are located in the hypothalamus.

(d) The term baroreceptors refers to receptors that measure blood pressure.

**The next TWO questions refer to the diagram below.**



15. The youngest and oldest layers are, in order,

(a) Q1 and R7.

(b) P1 and Q6.

(c) R1 and P6.

(d) Q1 and P6.

16. The dating technique shown in the diagram above

(a) demonstrates a relative dating technique as it gives the age in years.

(b) can’t be used to compare core samples that are over 50,000 years old.

(c) is adversely affected by geological disruptions such as faults.

(d) works because the youngest layer is put down first.

17. The receptors for the detecting the water levels of the plasma are:

a) osmoreceptors in the posterior pituitary gland.

b) plasmoreceptors in the kidney.

c) plasmoreceptors in the posterior pituitary gland.

d) osmoreceptors in the hypothalamus.

18. Fred suffers from diabetes mellitus (sugar diabetes). Three times each day, he

must inject insulin into his body to ensure that the concentration of glucose in

his blood stays at a relatively constant level. Sometimes Fred’s blood glucose

levels fall, causing him to feel weak and dizzy.

Which of the following could cause a drop in blood glucose level?

1. Injection of too much insulin.

2. Injection of too little insulin.

3. Too much exercise.

4. Too little exercise.

5. Eating too much carbohydrate.

6. Eating too little carbohydrate.

a) 1, 3 and 5.

b) 1, 3 and 6.

c) 2, 4 and 5.

d) 2, 4 and 6.

19. Hyperventilation can be dangerous because:

1. it increases Carbon Dioxide concentration in the blood.
2. it decreases Carbon Dioxide concentration in the blood.
3. it increases Oxygen concentration in the blood.
4. it decreases Oxygen concentration in the blood.

20. Acidic soils:

1. Preserve bone and soft tissue well.
2. Break down bone tissue but reduce bacterial decomposition of soft tissue.
3. Increase bacterial activity and as a result all tissue is lost.
4. Are important in stratigraphy.

21. Alcohol intake will cause:

1. Blood glucose levels to rise and tissue osmotic potential to increase.
2. Blood glucose levels to drop and tissue osmotic potential to increase.
3. Blood glucose levels to rise and tissue osmotic potential to increase.
4. Blood glucose levels to remain unchanged but tissue osmotic potential to rise.

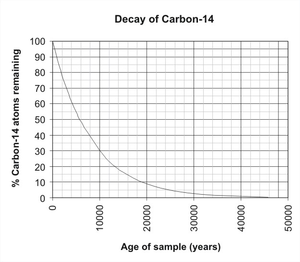
22. Methamphetamines cause:

1. the release of noradrenaline, serotonin and dopamine. As a result they act as depressants.
2. a reduction in the uptake of blood glucose by neurones and always act as depressants.
3. Stimulation of the parasympathetic nervous system and for that reason are called a stimulants.
4. the release of noradrenaline, serotonin and dopamine and are stimulants.

23. Hormone replacement therapy (HRT):

1. is given to some women whose oestrogen and progesterone levels drop significantly because of the menopause.
2. is given to some women whose oestrogen and progesterone levels rise significantly because of the menopause.
3. is given to some women whose oestrogen and progesterone levels drop significantly because of the menarche.
4. is given to some women whose oestrogen and progesterone levels rise significantly because of the menarche.

Use the table below to answer the following two questions.



24. Axe with an obsidian (natural volcanic glass) head and a wooden handle is found. The axe is said to contain a C14content of 30%.

* 1. The carbon C14 content would have been found from the axe head and the axe is about 10,000 years old.
  2. The carbon C14 content would have been found from the axe handle and the axe is about 10,000 years old.
  3. The carbon C14 content would have been found from the axe head and the axe is about 50,000 years old.
  4. The axe could not be dated using C14content.

25. C14 has a half-life of 5730 years. This means:

a. the amount of C14 left after 11,460 years will be 50%.

b. the amount of C14 left after 11,460 years will be 25%.

1. the amount of C14 left after 11,460 years will be 10%.
2. the amount of C14 left after 11,460 years will be 75%.

Section B

1. The pancreas is located behind the lower part of the stomach. It makes hormones and enzymes that help the body digest and use food. Insulin is a hormone that helps the body convert \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Insulin disruption can cause diseases. Complete the following passages about these diseases.

Type 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ develops when the body doesn't make enough insulin, causing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to build up in the blood. In type 1, due to an autoimmune disease-the beta cells of the pancreas no longer make insulin because the body's immune system has attacked and destroyed them.

Type 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ usually begins with a condition called \_\_\_\_\_\_\_\_\_\_\_\_\_\_ resistance, in which the body has difficulty using insulin effectively. Over time, insulin production declines as well, so many people with type 2 diabetes eventually need to take insulin.

(6 marks)

More questions on the next page

1. A. Nancy is riding her bike on a hot day. During the bike ride her core body temperature does not rise above 37 oC. Use a simple flow diagram to show how her body maintains this core temperature by physiological means?

(5 marks)

B. After her ride what are some behavioural steps Nancy could make to help maintain core temperature homeostasis?

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(2 marks)

C. Nancy rides her bike the same distance at the same speed on two separate days. On both days the air temperature is 30 oC. On the first day the humidity (air moisture content) is 90%. On the second day there is a humidity of 40%.

On which day will Nancy have the most difficulty keeping core body temperature constant? Give a reason for your answer.

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1. marks)
2. The drug ecstasy has the opposite effect to alcohol on the amount of ADH produced by the body. This can lead to a disorder known as dilutional hyponatraemia. Here the blood plasma has too much water and the calcium ion concentration in the plasma becomes too dilute. Signs and symptoms of hyponatremia include nausea and vomiting, headache, short-term memory loss, confusion, lethargy, fatigue, muscle weakness, cramps, seizures, and decreased consciousness or coma.
3. Explain the reason for the change in plasma water content.
4. marks)

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1. What will be the effect on urine production caused by ecstasy?

(2 marks)

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1. Emphysema can be caused by exposure to polluted air. What is the most common cause of emphysema? Describe how emphysema affects the lungs and the impact it has on the person. How can emphysema be treated?

(7 marks)

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

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