**Excretion in the Human**

**SKIN**

**Q 2016 12 c**

(i) What is meant by the term homeostasis?

(ii) Increased metabolic rate, piloerection and vasoconstriction are responses in mammals to falling external temperatures.

1. Explain the term metabolism.

2. What is the effect of an increase in metabolic rate in response to falling external temperatures?

3. What term is used to describe animals that can vary their metabolic rate significantly?

4. Suggest how animals that cannot significantly vary their metabolic rate may respond to falling external temperatures.

5. What is meant by the term piloerection?

Explain how piloerection can be an important response to falling external temperatures.

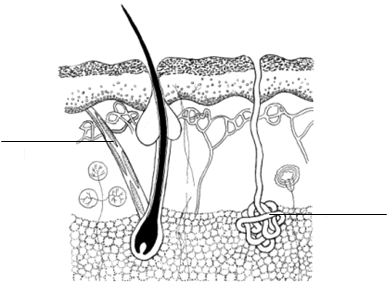
6. Explain how vasoconstriction can be an important response to falling external temperatures.

**MS 2016 12 c**

|  |  |  |  |
| --- | --- | --- | --- |
| (i) | *Homeostasis* Maintenance of a constant internal environment | | **3** |
| (ii) | 1. | *Metabolism:* All chemical reactions in the organism (or in the cell or in the body) | **3** |
|  | 2. | *Effect of increase:* Generates heat **or** temperature increase | **3** |
|  | 3. | *Term:* \*Endotherm(s) **or** \*Endothermic | **3** |
|  | 4. | *Ectotherm response:* Take shelter **or** move to a warm place **or** hibernate | **3** |
|  | 5. | *Piloerection:* Hairs standing up | **3** |
|  |  | *Importance:* Traps air **or** insulates **or** reduces heat loss | **3** |
|  | 6. | *Vasoconstriction importance:* Reduces blood flow to skin **or** reduces heat loss | **3** |

**Q 2015 6**

6. The diagram shows a vertical section through human skin.



A

B

(a) Place an X on the adipose tissue.

(b) Name A and B

(c) Define each of the following words and explain how each process keeps the human body warm

(i) Piloerection.

(ii) Vasoconstriction

**MS 2015 6**

(a) X correctly placed on adipose tissue

(b) A = erector muscle B = sweat gland

**6.**

**8 + 7 + 5(1)**

(c) (i) *Piloerection*:

Hair stands up

Air is trapped **or** (air) insulates **or** reduces (or prevents)

heat loss

(ii) *Vasoconstriction*: Blood vessels (or arteries or arterioles) narrow

Reducing (or preventing) heat loss **or** less blood to skin

**Q 2007 15 c**

(i) What is homeostasis? Note one reason why it is important in the human body.

(ii) Draw a diagram of a section through human skin to show two structures involved in temperature regulation. Label each of these structures.

(iii) For one of the structures that you have labelled in your diagram briefly describe its role in temperature regulation.

(iv) What is meant by an ectotherm?

**MS 2007 15 c**

|  |  |  |
| --- | --- | --- |
| **(i)** | *Homeostasis:* maintenance / of constant internal environment or two named factors constant  *Reason:* allows normal metabolic activities or example **or** keeps | **2(3)** |
|  | temperature suitable for enzyme reactions | **3** |
| **(ii)** | diagram [*top layer, hair follicle or sweat gland + 1 other*]  *labels* [*sweat gland, hair, arteriole, fat*] [*allow* temperature receptor] | **3, 0**  **2+1** |
| **(iii)** | temperature drop / hair erects / traps air as insulator [or opposite]  **or** temperature drop / arteriole constricts / keeps heat [or opposite] |  |
|  | **or** temperature rises / sweat produced / sweat evaporates causing cooling |  |
|  | **or** fat / insulates / from outside or inside | **3(3)** |
| **(iv)** | body temperature varies / with environmental temperature [*allow* ‘cold-blooded’ or explained for 3 marks] | **2(3)** |

**Q 2004 12 c**

Answer the following questions in relation to human body temperature.

(i) What is the source of the heat that allows the body to maintain a constant internal temperature?

(ii) State two ways in which the body is insulated against loss of heat.

(iii) Describe the ways in which the body responds when its internal temperature rises above the normal level.

(iv) Describe briefly the hormonal and nervous responses that occur when internal body temperature drops.

**MS 2004 12 c**

1. **(i) Source:** respiration **or** named site e.g. muscle, liver, kidney, brain **or** named food e.g. carbohydrate or named **3**
2. **Two methods of insulation:** fat (adipose tissue) / (trapped) air **or** hair

**2(3)**

1. **When temp high:** vasodilation (or explained) / (secretion of) sweat / hairs lie flat **or** less air trapped ***any two* 2(3)**
2. **Response when temp drops:** receptor (or detection) / receptor in skin / receptor in medulla **or** brain / shiver / generates heat / hairs stand up

or goose bumps / air trapped / vasoconstriction (or explained) / increased metabolic rate or increased respiration / any relevant comment on named hormone e.g. thyroxine increases metabolic rate or increases respiration

***any three* 3(3)**