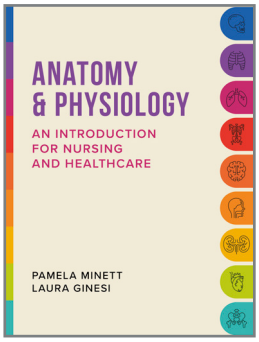
Lantern



Questions to accompany *Anatomy and Physiology*

CHAPTER 3 THE SKIN

Multiple Choice Questions (MCQs)

Each question consists of a stem statement or question, and 5 options. You must pick the one correct answer.

1. Which organ in the list is the largest of the human body?

A. bone marrow
B. liver
C. skin
D. brain
E. heart

2. Which transparent layer of the skin does not contain blood vessels?

A. dermis
B. adipose layer
C. epidermis
D. serosa
E. adventitia

3. When epidermal cells move towards the surface of skin, they become filled with:

A. haemoglobin
B. immunoglobulin
C. thrombin
D. collagen
E. keratin

4. The function of sebaceous glands is to produce:

A. sebum
B. sweat
C. melanin
D. keratin
E. collagen

5. The term erythema refers to:

A. function of erythrocytes
B. increased blood flow to skin
C. the action of the antibiotic erythromycin
D. yellowing of skin
E. a female sex hormone

6. Deviation from the thermoregulatory set point is detected by:

A. sensory nerve endings in the skin
B. the liver
C. skeletal muscles
D. the hypothalamus
E. peripheral arterioles

7. An increase in the temperature of blood activates which effector responses?

A. vasoconstriction of arterioles in skin and sweating
B. vasodilation of arterioles in skin and sweating
C. vasoconstriction of arterioles in skin and shivering
D. vasodilation of arterioles in skin and shivering
E. vasodilation of arterioles in the skin and thermogenesis

8. When a person goes outdoors into a cold environment:

A. heat loss is limited and heat-loss responses are activated
B. the rate of sweat production increases
C. the thermoregulatory centre in the hypothalamus is inhibited
D. blood flow to the skin increases
E. heat loss is limited and heat-gaining responses are activated

9. The term hypothermia refers to:

A. body temperature below the normal range
B. body temperature above the normal range
C. heat exhaustion or heat stroke
D. poor response to thermal challenge
E. fever

10. Identify the correct sequence of the phases of wound healing:

A. proliferation; inflammation; epithelialisation; remodelling
B. remodelling; inflammation; proliferation; epithelialisation
C. inflammation; proliferation; epithelialisation; remodelling
D. epithelialisation; proliferation; inflammation; remodelling
E. inflammation; epithelialisation; proliferation; remodelling

11. The term haemostasis refers to:

A. a red pigment in blood cells
B. bleeding
C. dialysis of blood
D. stoppage of blood flow
E. study of blood

12. Granulation tissue forms when a wound is healing and is:

A. made by leucocytes (white cells)
B. a normal and desirable process
C. an abnormal and undesirable process
D. due to removal of old blood vessels
E. a very painful process

Critical thinking: ARQs (assertion reasoning questions)

These questions consist of two statements:

- an assertion, and
- a reason.

You must first determine whether each statement is *TRUE* or *FALSE*.

- If both statements are true, you must next determine whether the reason correctly explains the assertion. The answer will be option 1 or option 2.
- If one statement is true and the other is false then the answer is option 3 or option 4, depending on which of the statements is correct.
- If both statements are false, then the answer is option 5.

There is one option for each possible outcome.

Question 13

A = the Assertion	**R = the Reason**
Skin forms a barrier between the internal environment of the body and the external environment	Skin is a tissue layer that covers the body surface
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 14

A = the Assertion	**R = the Reason**
The stratum basale of the epidermis continually produces new cells by mitosis (cell division)	The epidermis contains cells that become filled with keratin
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 15

A = the Assertion	**R = the Reason**
Cyanosis is discolouration of skin and mucous membranes due to hypoxia	Melanocytes are cells in skin that produce the pigment melanin
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 16

A = the Assertion	R = the Reason
Vasodilation of arterioles in the dermis is an important effector response to a cold stimulus	When blood supply to skin capillary loops is increased, heat loss through the skin is minimised
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Question 17

A = the Assertion	R = the Reason
Skin plays an essential role in homeostasis of body temperature (thermoregulation)	Blood vessels in the dermis dilate in response to injury, making skin feel warm
Options	
1) Both A and R are true and R is the correct explanation of A	
2) Both A and R are true but R is NOT the explanation of A	
3) A is true but R is false	
4) A is false but R is true	
5) Both A and R are false	

Putting it all together

Question 18

Explain, in your own words, how skin heals after it has been punctured by a hypodermic needle.

Question 19

Create a series of labelled sketches that show the structure of skin and the human body's ability to heal wounds. Don't forget to include the effect of different factors such as malnutrition and age on healing processes.

Question 20

Construct a flow chart or mind map that shows interactions between skin and the external environment. Include the following key words and write notes on your diagram. Create the diagram in a way that explains relationships between the words – use coloured pens, arrows and additional words to do this.

You may repeat or add any additional words that you need to create your figure.

Ageing	Fibroblasts	Proliferation
Blood flow	Granulation	Remodelling
Capillary permeability	Haemostasis	Sebaceous gland
Commensal bacteria	Hair	Sensory receptor
Connective tissue	Hypothalamus	Subcutaneous
Dermis	Inflammation	Sweat gland
Epidermis	Keratin	Vasoconstriction
Erector pili	Melanin	Vasodilation

Answers to questions

Answers are supplied to most, but not all questions. Some may require you to carry out further research using the book.

Multiple Choice Questions (MCQs)

Each question consists of a stem statement or question, and 5 options. You must pick the one correct answer.

1. **Which organ in the list is the largest of the human body?**
   C. skin

2. **Which transparent layer of the skin does not contain blood vessels?**
   C. epidermis

3. **When epidermal cells move towards the surface of skin, they become filled with:**
   E. keratin

4. **The function of sebaceous glands is to produce:**
   A. sebum

5. **The term erythema refers to:**
   B. increased blood flow to skin

6. **Deviation from the thermoregulatory set point is detected by:**
   D. the hypothalamus

7. **An increase in the temperature of blood activates which effector responses?**
   B. vasodilation of arterioles in skin and sweating

8. **When a person goes outdoors into a cold environment:**
   E. heat loss is limited and heat-gaining responses are activated

9. **The term hypothermia refers to:**
   A. body temperature below the normal range

10. **Identify the correct sequence of the phases of wound healing:**
    C. inflammation; proliferation; epithelialisation; remodelling

11. **The term haemostasis refers to:**
    D. stoppage of blood flow

12. **Granulation tissue forms when a wound is healing and is:**
    B. a normal and desirable process

Critical thinking: ARQs (assertion reasoning questions)

These questions consist of two statements:
- an assertion, and
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You must first determine whether each statement is *TRUE* or *FALSE*.
- If both statements are true, you must next determine whether the reason correctly explains the assertion. The answer will be option 1 or option 2.
- If one statement is true and the other is false then the answer is option 3 or option 4, depending on which of the statements is correct.
- If both statements are false, then the answer is option 5.

There is one option for each possible outcome.

Question 13

A = the Assertion	R = the Reason
Skin forms a barrier between the internal environment of the body and the external environment	Skin is a tissue layer that covers the body surface
3. A is true but R is false	

Explanation

A key function of skin is to cover the body and protect it from injury, infection or other damage so the Assertion (A) is *TRUE*.

Skin is an organ not a tissue, so the Reason (R) is *FALSE*.

Option 3 is the correct answer.

Question 14

A = the Assertion	R = the Reason
The stratum basale of the epidermis continually produces new cells by mitosis (cell division)	The epidermis contains cells that become filled with keratin
2. Both A and R are true but R is NOT the explanation of A	

Explanation

Epidermal cells are continually produced through division (mitosis) of stem cells in the basal layer (stratum basale) so the Assertion (A) is *TRUE*.

The new cells are continually pushed towards the surface of the skin where they are shed and lost to the environment.

As the cells migrate they become keratinised (filled with the protein keratin) so the Reason (R) is also *TRUE*. The function of the keratin is to provide strength and durability to the skin.

Option 2 is thus the correct answer because R does not provide an explanation for A.

Question 15

A = the Assertion	R = the Reason
Cyanosis is discolouration of skin and mucous membranes due to hypoxia	Melanocytes are cells in skin that produce the pigment melanin
2. Both A and R are true but R is NOT the explanation of A	

Explanation

The Assertion (A) is *TRUE* because the term cyanosis refers to bluish, grey or purple discolouration of tissues due to low levels of oxygen.

The Reason (R) is *TRUE*, but melanin production is NOT the reason for the bluish or darker tinges of cyanosis, because melanin is black–brown pigment.

Hence **option 2 is the correct answer** to choose.

Question 16

A = the Assertion	R = the Reason
Vasodilation of arterioles in the dermis is an important effector response to a cold stimulus	When blood supply to skin capillary loops is increased, heat loss through the skin is minimised

5. Both A and R are false

Explanation

The Assertion (A) is *FALSE* because vasodilation of skin arterioles is part of the effector response to heat.

The Reason (R) is similarly *FALSE* because increased blood flow to skin increases heat loss to the environment.

Since both statements are untrue, **option 5 is the correct solution** to this problem.

Question 17

A = the Assertion	R = the Reason
Skin plays an essential role in homeostasis of body temperature (thermoregulation)	Blood vessels in the dermis dilate in response to injury, making skin feel warm

2. Both A and R are true but R is NOT the explanation of A

Explanation

The Assertion (A) is *TRUE*.

The Reason (R) is *TRUE*.

However, thermoregulation and the inflammatory response are distinct physiological processes with different trigger stimuli, so **option 2 is the best option to choose**.