***Essentials of Human Anatomy and Physiology, 10e* (Marieb)**
Chapter 1 The Human Body: An Orientation

1.1 Short Answer

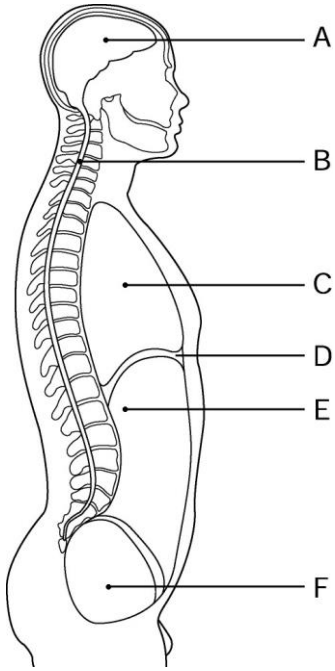

Figure 1.1

Using Figure 1.1, identify the following:
1) Identify the cavity that houses the brain.
Answer: A
Diff: 1 Page Ref: 20

2) Label B points to the _____ cavity.
Answer: spinal
Diff: 1 Page Ref: 20

3) Identify the cavity formed by the rib cage.
Answer: C
Diff: 1 Page Ref: 20

4) Identify the structure that separates the thoracic cavity from the rest of the ventral cavity.
Answer: D
Diff: 1 Page Ref: 20

5) Label E points to the _____ cavity.
Answer: abdominal
Diff: 1 Page Ref: 20

6) Identify the cavity that houses reproductive organs, urinary bladder, and the rectum.
Answer: F
Diff: 1 Page Ref: 20

Fill in the blank or provide a short answer:
7) Groups of cells that have a common function are termed _____.
Answer: tissues
Diff: 1 Page Ref: 2

8) The heart and blood vessels are the primary organs of the _____ system.
Answer: cardiovascular
Diff: 1 Page Ref: 4

9) The system that functions in the storage of minerals, such as calcium, is called the _____ system.
Answer: skeletal
Diff: 1 Page Ref: 3

10) The _____ system rids the body of indigestible food residue in feces while the _____ system removes nitrogen-containing metabolic waste in urine.
Answer: digestive; urinary
Diff: 2 Page Ref: 4, 7

11) _____ refers to all of the chemical reactions in the body.
Answer: Metabolism
Diff: 1 Page Ref: 9

12) The ability to sense changes and react to them is termed _____ or _____.
Answer: irritability; responsiveness
Diff: 1 Page Ref: 8

13) The component of a control system that provides the means for the control center's response (output) is called the _____.
Answer: effector
Diff: 1 Page Ref: 12

14) The study of the body's small structures using a microscope is called _____.
Answer: microscopic anatomy
Diff: 1 Page Ref: 2

15) The role of the effector in the negative feedback mechanism is to _____ the stimulus while it _____ the stimulus in the positive feedback mechanism.
Answer: decrease, inhibit, or depress; enhances or increases
Diff: 2 Page Ref: 12

16) The body's ability to maintain stable internal conditions is referred to as _____.
Answer: homeostasis
Diff: 1 Page Ref: 12

17) The navel is _____ to the spine.
Answer: ventral or anterior
Diff: 2 Page Ref: 15

18) The armpit area is called the _____ region.
Answer: axillary
Diff: 1 Page Ref: 16

19) The antebrachial region is _____ to the brachial region.
Answer: inferior or distal
Diff: 1 Page Ref: 16

20) The central region of the thoracic cavity containing the heart is called the _____.
Answer: mediastinum
Diff: 1 Page Ref: 20

21) The right and left iliac (inguinal) regions are lateral to the _____ region.
Answer: hypogastric
Diff: 2 Page Ref: 21

22) The cranial and spinal cavities are subdivisions of the _____ cavity.
Answer: dorsal
Diff: 1 Page Ref: 20

23) A _____ section divides the body into equal left and right halves.
Answer: midsagittal or median
Diff: 1 Page Ref: 17

24) Blood is categorized as a _____ because it is composed of similar cells with a common function.
Answer: tissue
Diff: 1 Page Ref: 2

25) Ventral is a directional term synonymous with _____ in humans.
Answer: anterior
Diff: 1 Page Ref: 15

26) The three medial regions of the abdominopelvic cavity are _____, _____, and _____.
Answer: epigastric region, umbilical region, hypogastric region
Diff: 3 Page Ref: 21

27) The navel is located in the _____ region of the abdominopelvic cavity.
Answer: umbilical
Diff: 1 Page Ref: 21

28) The two major body cavities are _____ and _____.
Answer: ventral; dorsal
Diff: 1 Page Ref: 18

29) Blood clotting and the birth of a baby are examples of the _____ feedback mechanism.
Answer: positive
Diff: 1 Page Ref: 13

30) The orbital cavities house the _____.
Answer: eyes
Diff: 1 Page Ref: 22

31) The abdominopelvic cavity has _____ quadrants and _____ regions.
Answer: 4; 9
Diff: 2 Page Ref: 21

32) The thoracic cavity is _____ to the abdominopelvic cavity.
Answer: superior
Diff: 1 Page Ref: 20

33) The epigastric region is _____ to the right hypochondriac region of the abdominopelvic cavity.
Answer: medial
Diff: 2 Page Ref: 21

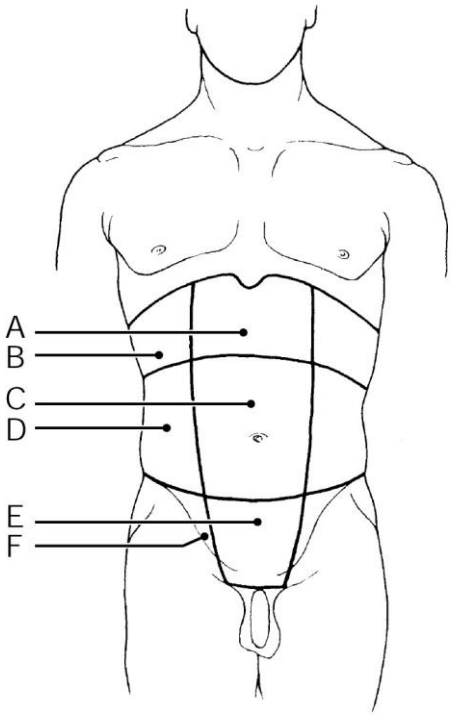

Figure 1.2

Using Figure 1.2, identify the following:

34) Which region is associated with the hip and is situated lateral to the hypogastric region?
Answer: F
Diff: 2 Page Ref: 21

35) Which region is the umbilical region?
Answer: C
Diff: 1 Page Ref: 21

36) Which region is lateral to the umbilical region?
Answer: D
Diff: 1 Page Ref: 21

37) Which region is associated with the lower ribs?
Answer: B
Diff: 1 Page Ref: 21

38) The hypogastric region is:
Answer: E
Diff: 1 Page Ref: 21

39) The epigastric region is:
Answer: A
Diff: 1 Page Ref: 21

1.2 Multiple Choice

1) The study of the function of the body and body parts is called:
A) anatomy
B) physiology
C) homeostasis
D) negative feedback
E) irritability
Answer: B
Diff: 1 Page Ref: 2

2) Which of the following activities does NOT represent an anatomical study:
A) making a section through the heart to observe its interior
B) examining the surface of a bone
C) viewing muscle tissue through a microscope
D) studying how the nerves conduct electrical impulses
E) observing the parts of a reproducing cell
Answer: D
Diff: 2 Page Ref: 2

3) Which of the following is the correct sequence, going from simplest to most complex, in the levels of structural organization of the human body:
A) chemical level, cellular level, tissue level, organ level, organ system level, organismal level
B) chemical level, tissue level, cellular level, organ system level, organ level, organismal level
C) cellular level, chemical level, tissue level, organ level, organ system level, organismal level
D) cellular level, tissue level, chemical level, organ level, organ system level, organismal level
E) cellular level, chemical level, tissue level, organ system level, organismal level, organ level
Answer: A
Diff: 3 Page Ref: 2

4) The building blocks of *all* matter are known as:
A) organs
B) tissues
C) atoms
D) cells
E) organ systems
Answer: C
Diff: 2 Page Ref: 2

5) Hematopoiesis, or blood cell formation, is a function of the:
A) muscular system
B) respiratory system
C) skeletal system
D) nervous system
E) integumentary system
Answer: C
Diff: 3 Page Ref: 3-4

6) The main function of the respiratory system is:
A) transport oxygen, nutrients, and wastes to and from body cells and tissues
B) produce sperm and eggs
C) supply the body with oxygen and remove carbon dioxide
D) control body activities through hormones released into the blood
E) break down food and deliver the products to the blood for dispersal
Answer: C
Diff: 1 Page Ref: 4

7) The system that controls and coordinates the body through hormones is the:
A) integumentary system
B) skeletal system
C) nervous system
D) endocrine system
E) digestive system
Answer: D
Diff: 2 Page Ref: 4

8) The muscular system consists of the:
A) skeletal muscles
B) muscles of the heart
C) muscles in the walls of hollow organs
D) skeletal muscles and the muscles of the heart
E) muscles of the heart and those in the walls of the hollow organs
Answer: A
Diff: 1 Page Ref: 4

9) Which two organ systems include the pancreas:
A) digestive and endocrine systems
B) urinary and respiratory systems
C) reproductive and urinary systems
D) digestive and respiratory systems
E) endocrine and respiratory systems
Answer: A
Diff: 2 Page Ref: 4

10) Which system covers the external surface of the body and protects deeper tissues:
A) endocrine system
B) integumentary system
C) nervous system
D) lymphatic system
E) skeletal system
Answer: B
Diff: 2 Page Ref: 3

11) What is the major function of the urinary system:
A) return leaked fluids back to the cardiovascular system
B) produce offspring
C) eliminate nitrogen-containing metabolic wastes from the body
D) break down food into absorbable units
E) secrete hormones to regulate body processes such as growth and reproduction
Answer: C
Diff: 2 Page Ref: 7

12) Which of the following is NOT a necessary life *function*:
A) maintaining boundaries
B) movement
C) responsiveness
D) nutrients
E) metabolism
Answer: D
Diff: 2 Page Ref: 7-9

13) Which of the following systems is matched most accurately to the life function it provides:
A) integumentary system - movement
B) nervous system - excretion
C) muscular system - maintaining boundaries
D) nervous system - responsiveness
E) respiratory system - digestion
Answer: D
Diff: 1 Page Ref: 4, 8

14) Which of these is NOT a survival need:
A) nutrients
B) oxygen
C) water
D) reproduction
E) body temperature
Answer: D
Diff: 2 Page Ref: 9, 12

15) Which of the following is the correct order of elements in a control system:
A) receptor, stimulus, afferent pathway, control center, efferent pathway, effector, response
B) receptor, stimulus, efferent pathway, control center, afferent pathway, effector, response
C) effector, stimulus, efferent pathway, control center, afferent pathway, receptor, response
D) stimulus, receptor, afferent pathway, control center, efferent pathway, effector, response
E) stimulus, receptor, efferent pathway, control center, afferent pathway, effector, response
Answer: D
Diff: 3 Page Ref: 13

16) Which of the following elements of a control system detects a change:
A) control center
B) stimulus
C) effector
D) receptor
E) efferent pathway
Answer: D
Diff: 1 Page Ref: 12-13

17) Positive feedback systems:
A) regulate heart and breathing rates
B) operate in such a way that the initial stimulus is enhanced and increases
C) operate in such a way that the initial stimulus is shut off or reduced
D) regulate heart and breathing rates, and operate in such a way that the initial stimulus is enhanced and increases
E) regulate heart and breathing rates, and operate in such a way that the initial stimulus is shut off or reduced
Answer: B
Diff: 2 Page Ref: 13

18) Which of the following is considered a normal body temperature:
A) 29 degrees Celsius
B) 35 degrees Celsius
C) 37 degrees Celsius
D) 42 degrees Celsius
E) 45 degrees Celsius
Answer: C
Diff: 1 Page Ref: 9

19) When correctly situated in anatomical position, where are your feet in relation to your knees:
A) proximal
B) medial
C) superior
D) distal
E) deep
Answer: D
Diff: 2 Page Ref: 15

20) Which of the following orientation and directional terms have the same meaning (in humans):
A) superior and caudal
B) inferior and cranial
C) inferior and cephalad
D) anterior and ventral
E) anterior and dorsal
Answer: D
Diff: 2 Page Ref: 15

21) Which of the following orientation terms have opposite meanings (in humans):
A) superficial and proximal
B) distal and proximal
C) medial and distal
D) medial and anterior
E) posterior and intermediate
Answer: B
Diff: 2 Page Ref: 15

22) Which of the following regional terms means the anterior surface of the elbow:
A) calcaneal region
B) scapular region
C) gluteal region
D) vertebral region
E) antecubital region
Answer: E
Diff: 2 Page Ref: 16

23) Mandy pulled a muscle in the inguinal region. Where is this region:
A) groin
B) buttock
C) leg
D) thigh
E) hip
Answer: A
Diff: 2 Page Ref: 17

24) In describing the relationship between the patellar and popliteal regions:
A) the patellar region is superior to the popliteal region
B) the patellar region is proximal to the popliteal region
C) the patellar region is distal to the popliteal region
D) the patellar region is lateral to the popliteal region
E) the patellar region is anterior to the popliteal region
Answer: E
Diff: 3 Page Ref: 16-17

25) Which body cavity can be subdivided into four quadrants and nine regions:
A) thoracic cavity
B) spinal cavity
C) nasal cavity
D) orbital cavity
E) abdominopelvic cavity
Answer: E
Diff: 2 Page Ref: 21

26) The lungs and heart are situated in the _____ body cavity.
A) dorsal
B) spinal
C) thoracic
D) cranial
E) abdominopelvic
Answer: C
Diff: 1 Page Ref: 20

27) Which of these body regions is located on the anterior side of the body:
A) popliteal
B) sternal
C) lumbar
D) gluteal
E) occipital
Answer: B
Diff: 2 Page Ref: 16-17

28) The region that refers to the fingers and toes is the:
A) carpal region
B) digital region
C) antebrachial region
D) brachial region
E) axillary region
Answer: B
Diff: 1 Page Ref: 16-17

29) The dorsal body cavity houses the:
A) urinary and reproductive organs
B) heart and lungs
C) digestive and reproductive organs
D) tongue
E) spinal cord and brain
Answer: E
Diff: 2 Page Ref: 20

30) Which of these regions are associated with the parts of the arm:
A) femoral, popliteal, patellar
B) brachial, antecubital, carpal
C) nasal, oral, occipital
D) acromial, sacral, gluteal
E) pelvic, pubic, inguinal
Answer: B
Diff: 2 Page Ref: 16

31) Which of these regions is NOT associated with the ventral (anterior) portion of the head:
A) buccal
B) oral
C) orbital
D) occipital
E) nasal
Answer: D
Diff: 2 Page Ref: 16-17

32) A section that divides the body on the longitudinal plane into equal right and left parts is called:
A) median (midsagittal)
B) frontal
C) transverse
D) oblique
E) coronal
Answer: A
Diff: 1 Page Ref: 17

33) Which type of section could be used to separate the thoracic cavity from the abdominopelvic cavity:
A) coronal
B) sagittal
C) dorsal
D) ventral
E) transverse
Answer: E
Diff: 1 Page Ref: 20

34) Which ventral cavity subdivision has no bony protection:
A) thoracic
B) pelvic
C) abdominal
D) cranial
E) spinal
Answer: C
Diff: 2 Page Ref: 20

35) Which set of regions in the abdominopelvic cavity is medial:
A) umbilical, right lumbar, and left lumbar regions
B) epigastric, umbilical, and hypogastric regions
C) iliac (inguinal), lumbar, and hypogastric regions
D) epigastric, right, and left hypochondriac regions
E) right and left iliac (inguinal), and hypogastric regions
Answer: B
Diff: 3 Page Ref: 21

36) The thoracic cavity is _____ to the abdominopelvic cavity.
A) inferior
B) lateral
C) proximal
D) superior
E) dorsal
Answer: D
Diff: 2 Page Ref: 20

37) The ribs are located in the:
A) right and left iliac regions
B) right and left lumbar regions
C) right and left pubic regions
D) right and left hypochondriac regions
E) right and left inguinal regions
Answer: D
Diff: 2 Page Ref: 21

38) Which of the following statements is correct regarding the location of the stomach:
A) the stomach is located in the left upper quadrant
B) the stomach is located in the right upper quadrant
C) the stomach is located medially
D) the stomach is located in the left lower quadrant
E) the stomach is located in the right lower quadrant
Answer: A
Diff: 3 Page Ref: 20

1.3 True/False

1) The highest level of structural organization in humans is the organ level.
Answer: FALSE
Diff: 1 Page Ref: 2

2) The endocrine system is the fast-acting body control system.
Answer: FALSE
Diff: 1 Page Ref: 4

3) The adrenals, pancreas, thyroid, and parathryoids are glands of the endocrine system.
Answer: TRUE
Diff: 2 Page Ref: 4

4) The lymphatic system collects fluids leaked by the cardiovascular system and returns them to the bloodstream.
Answer: TRUE
Diff: 1 Page Ref: 4

5) The maintenance of boundaries between the internal organs of the body and the outside world is achieved by the endocrine system.
Answer: FALSE
Diff: 2 Page Ref: 3

6) Most homeostatic control mechanisms are negative feedback reactions.
Answer: TRUE
Diff: 2 Page Ref: 13

7) The human body consists of approximately 60% to 80% water.
Answer: TRUE
Diff: 1 Page Ref: 9

8) In anatomical positions, the palms are oriented medially.
Answer: FALSE
Diff: 2 Page Ref: 14

9) The heel of the foot constitutes the plantar region.
Answer: FALSE
Diff: 1 Page Ref: 16-17

10) *Proximal* means farther from the origin of a body part.
Answer: FALSE
Diff: 2 Page Ref: 15

11) The hypogastric region is directly superior to the umbilical region.
Answer: FALSE
Diff: 2 Page Ref: 21

12) The thoracic cavity is separated from the abdominopelvic cavity by the diaphragm.
Answer: TRUE
Diff: 2 Page Ref: 20

13) The spinal cavity is part of the ventral body cavity.
Answer: FALSE
Diff: 2 Page Ref: 20

14) Transverse or horizontal sections divide the body into anterior and posterior parts.
Answer: FALSE
Diff: 2 Page Ref: 17

15) There is no physical structure that separates the abdominal cavity from the pelvic cavity.
Answer: TRUE
Diff: 2 Page Ref: 20

1.4 Matching

Match the following:

A) on the inner side
B) behind
C) away from the body surface
D) in front of
E) toward the body surface
F) away from the head
G) farther from the origin of a body part or the point of attachment of a limb to the body trunk
H) toward the head
I) away from the midline
J) close to the origin of the body part or the point of attachment of a limb to the body trunk
K) toward the midline

1) Superior
Diff: 1 Page Ref: 15

2) Dorsal
Diff: 1 Page Ref: 15

3) Lateral
Diff: 1 Page Ref: 15

4) Deep
Diff: 2 Page Ref: 15

5) Distal
Diff: 2 Page Ref: 15

6) Medial
Diff: 1 Page Ref: 15

7) Superficial
Diff: 1Page Ref: 15

8)Proximal
Diff: 2 Page Ref: 15

9) Ventral
Diff: 1 Page Ref: 15

Answers: 1) H 2) B 3) I 4) C 5) G 6) K 7) E 8) J 9) D

Match the following:

A) elbow
B) anterior knee
C) posterior knee
D) curve of shoulder
E) leg
F) forearm
G) lateral surface of leg
H) posterior surface of head
I) navel
J) armpit

10) Axillary
Diff: 1 Page Ref: 16

11) Olecranal
Diff: 1 Page Ref: 16-17

12) Deltoid
Diff: 1 Page Ref: 16-17

13) Antebrachial
Diff: 1 Page Ref: 16-17

14) Popliteal
Diff: 1 Page Ref: 16-17

15) Umbilical
Diff: 1 Page Ref: 16-17

16) Occipital
Diff: 1 Page Ref: 16-17

17) Fibular
Diff: 1 Page Ref: 16-17

18) Patellar
Diff: 1 Page Ref: 16-17

19) Crural
Diff: 1 Page Ref: 16

Answers: 10) J 11) A 12) D 13) F 14) C 15) I 16) H 17) G 18) B 19) E

Match the following.

A) endocrine system
B) digestive system
C) muscular system
D) integumentary system
E) urinary system
F) skeletal system
G) lymphatic system
H) respiratory system

20) Produces hormones
Diff: 1 Page Ref: 4

21) Cleansing of blood by lymph nodes
Diff: 2 Page Ref: 4

22) Site of hematopoiesis
Diff: 2 Page Ref: 3

23) Regulation of water and electrolytes
Diff: 2 Page Ref: 7

24) Skeletal muscles move the bones
Diff: 1 Page Ref: 4

25) Helps regulate body temperature
Diff: 2 Page Ref: 3

Answers: 20) A 21) G 22) F 23) E 24) C 25) D

1.5 Essay

1) Distinguish between *anatomy* and *physiology*.
Answer: Anatomy is the study of the structure and shape of the body and body parts, and their relationships to one another. Physiology is the study of how the body and its parts work or function.
Diff: 1 Page Ref: 1-2

2) List, and briefly define, the human body's organization levels from smallest to largest.
Answer: 1. chemical level:
a. atoms are the basic building blocks of matter
b. molecules are units formed by atoms combining

2. cellular level: cells are the smallest living unit in living organisms

3. tissue level: tissues are groupings of cells performing a common function

4. organ level: an organ is a structure consisting of two or more tissue types

5. organ system level: an organ system describes a group of organs functioning cooperatively for a common purpose

6. organism level: a human organism consists of all of the organ systems of the body working together to promote healthy functioning (homeostasis)

Diff: 1 Page Ref: 2

3) Of the eight necessary human life functions, which one do you think is not absolutely necessary for us to survive on an organismal level? Explain your choice.
Answer: Reproduction at the organismal level is not absolutely necessary for each of us to survive day by day. It is not critical for our own survival that we reproduce new offspring via the production of eggs or sperm. Therefore, humans can live without a functional reproductive system and still maintain life.
Diff: 3 Page Ref: 7-9

4) List and explain the five survival needs of humans.
Answer: 1. Nutrients include carbohydrates, proteins, and fats, which are taken in via the diet for energy and cell building.
2. Oxygen required to release energy from food.
3. Water accounts for over 60% of the body weight, and provides the basis for various body fluids.
4. Appropriate body temperature when too high or too low, physiological activities cease, primarily because molecules are destroyed or become nonfunctional.
5. Appropriate atmospheric pressure the force exerted on the surface of the body by the weight of air; is essential for normal operation of the respiratory system and breathing.

Diff: 3 Page Ref: 9, 12

5) Describe how a *midsagittal* section differs from a *sagittal* section.
Answer: A cut down the median plane of the body is known as a midsagittal or median section. This type of section creates equal left and right parts. A sagittal section creates a longitudinal cut down the body that creates left and right parts, presumably unequal.
Diff: 2 Page Ref: 17

6) Identify the two dorsal body cavities, and state their locations and the organs contained therein.
Answer: 1. Cranial cavity–the superior posterior space inside the bony skull that houses the brain.
2. Spinal cavity–the inferior posterior space inside the bony vertebral column that houses the spinal cord.
Diff: 2 Page Ref: 20

7) Compare and contrast the *antecubital* region to the *olecranal* region.
Answer: The antecubital region is the anterior surface of the elbow while the olecranal region is the posterior surface of the elbow. While both of these regions refer to the elbow, the antecubital region is anterior surface and the olecranal region is posterior surface.
Diff: 2 Page Ref: 16-17

8) Explain how scratching an itch is an example of the negative feedback mechanism.
Answer: 1. Stimulus or input is the itch.
2. A receptor carries the information about the stimulus (itch) to the brain via an afferent pathway.
3. Control center (brain) analyzes this information an turns on an effector which will cancel the stimulus.
4. Information reaches the effector via the efferent pathway from the brain. Muscles move the hand to scratch the itch.
5. Scratching continues until the itch goes away. The brain shuts off the effector once homeostasis is restored.
Diff: 3 Page Ref: 12-13

9) Explain the terms *distal* and *proximal* using an example.
Answer: The term distal means farther from the origin of a body part or point or the attachment of a limb to the trunk. The *ankle is distal to the knee* means the ankle is further from the leg's attachment to the trunk than the knee. The term proximal means closer to the origin of a body part of the point of attachment of a limb to the trunk. The *knee is proximal to the ankle* means the knee is closer to the leg's attachment to the trunk than the ankle.
Diff: 2 Page Ref: 15

10) Describe anatomical position. Explain why anatomical position is used.
Answer: Anatomical position is defined as standing erect, feet parallel to the arms, palms facing forward. Anatomical position is used because it is a standard position; it also helps us to avoid confusion. Additionally, anatomical position is a reference point that helps us accurately describe body parts and position.
Diff: 2 Page Ref: 14

11) Describe the role of the effector in the negative feedback system.
Answer: The effector is the control center's output and response to the stimulus. The effector's job is to cancel or shut off the control mechanism.
Diff: 1 Page Ref: 12