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National Board of Chiropractic Examiners NBCE Part I

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Question: 1

Which of the following cavities are contained within the dorsal cavity?

- A. Pelvic
- B. Thoracic
- C. Cranial
- D. Abdominal

Answer: C

Explanation:

The human body contains two major cavities: the dorsal cavity and the ventral cavity. The dorsal cavity contains the cranial and spinal cavities. Dorsal refers to the back part of the body. The brain and spinal cord are within the dorsal cavity. The ventral cavity includes the mediastinum and diaphragm and the thoracic, pleural, abdominal, and pelvic cavities. Ventral refers to the front of the body. The main organs that are within the ventral cavity include the lungs, heart, trachea, thymus gland, liver, gallbladder, pancreas, intestines, spleen, kidneys, ureters, bladder, reproductive organs, and parts of the large intestines (sigmoid colon and rectum).

Question: 2

The deltoid tuberosity is found on the

- A. radius.
- B. humerus.
- C. femur.
- D. tibia.

Answer: B

Explanation:

The upper extremity bones include the shoulder girdle, the upper and lower parts of the arms, the wrists, and the hands. The clavicle and the scapula make up the shoulder girdle. The upper arm bone is the humerus and the forearm includes the radius (on the thumb side) and the ulna (on the side of the little finger). The markings on the humerus include the head, anatomical neck, greater tubercle, lesser tubercle, intertubercular groove, surgical neck, deltoid tuberosity, radial groove, epicondyles, capitulum, trochlea, olecranon fossa, and coronoid fossa. The markings found on the radius include the head, radial tuberosity, and styloid process. The markings on the ulna include the olecranon process, coronoid process, trochlear notch, radial notch, head, and styloid process.

Question: 3

What are the bones called that protect the top of the cranium?

- A. Occipital
- B. Frontal
- C. Parietal
- D. Temporal

Answer: C

Explanation:

The skeleton is divided into two parts: the axial and the appendicular skeletons. The parts of the body that are included in the axial skeleton include the head, neck, and torso. In the head, the parietal bones are the bones that protect the top of the cranium and are described as bulging. Other main bones around the skull include the frontal bone, temporal bones, occipital bone, sphenoid bone, and ethmoid bone. Facial bones including the upper and lower jaw, cheek, nose, hard palate, ear, orbits of the eye and the hyoid bone are part of the axial skeleton. In the torso area the vertebral column, sternum, and ribs are also part of the axial skeleton. There are 74 total bones in the axial skeleton as well as 6 very tiny bones within the middle ears. The appendicular skeleton consists of the bones of the arms and legs.

Question: 4

Which of the following muscles is NOT located in the back?

- A. Latissimus dorsi
- B. External abdominal oblique
- C. Intertransversarii
- D. Sternocleidomastoid

Answer: D

Explanation:

The sternocleidomastoid muscle is located in the neck and assists with chewing and facial expressions. There are a great number of muscles in the area of the back. There are superficial back muscles that help to move the head and limbs. Types of superficial muscles include the trapezius, deltoid, latissimus dorsi, and external abdominal oblique muscles. There are also deep back muscles that help to move the vertebral column and keep the trunk stabilized to help prevent injury. These types of muscles include interspinales, longissimus cervicis, iliocostalis thoracis, quadratus lumborum, and intertransversarii muscles.

Question: 5

Which of the following is NOT a muscle of the rotator cuff?

- A. Infraspinatus
- B. Teres minor
- C. Teres major
- D. Subscapularis

Answer: C

Explanation:

The rotator cuff refers to the shoulder area. It is a large group of muscles and tendons that attach the humerus to the scapula. The tendons and muscles surround the humerus forming a cuff. The rotator cuff muscles are the supraspinatus, infraspinatus, teres minor, and subscapularis. These muscles are typically identified by the acronym SITS. The origin of these muscles is the scapula and the insertion is the humerus. These muscles all work synergistically but they also have unique functions. The supraspinatus muscle helps with abduction of the arm. The teres minor and the infraspinatus muscles help with the outward rotation of the arm. The subscapularis muscle helps with the medial rotation of the arm.

Question: 6

Which of the following is NOT a physiologic change expected during a sympathetic response?

- A. Dilation of the cardiac vessels
- B. Increase in glycogenolysis
- C. Dilation of the blood vessels in the digestive tract
- D. Increase in lipolysis

Answer: C

Explanation:

The sympathetic division of the autonomic nervous system is considered the emergency response of the human body commonly called "fight or flight." When in any kind of danger, the sympathetic division sends out signals to increase the physiologic response to stress. Examples of this would be an increase in heart rate and an increase in contraction of the heart in order to increase blood supply and oxygen to skeletal muscles. There would also be dilation of both the cardiac and skeletal blood vessels in order to receive the additional blood supply. Blood supply to the digestive system and spleen would be reduced and the blood vessels in this area would be constricted. Respiratory rate would increase. Glycogenolysis and lipolysis would also increase as a way to increase available glucose and fatty acids necessary for muscle cells.

Question: 7

The type of muscle contraction used during the lifting of a weight in a bicep curl would be

- A. concentric contraction.
- B. eccentric contraction.
- C. isotonic contraction.

D. isometric contraction.

Answer: A

Explanation:

The action of lifting a weight during a bicep curl is an example of a concentric contraction of a muscle. This occurs when the movement results in the shortening of a muscle fiber. The lowering of the weight during a bicep curl would be an eccentric contraction where the muscle fiber is lengthened during the movement. An isotonic contraction is when the tension remains the same but the length of the fiber changes, such as in the action of pushups. An isometric contraction is when the muscle length is same but the tension increases. A plank hold or other exercise where the position is held steady is an example of an isometric contraction.

Question: 8

The conversion of glucose to pyruvic acid is called

- A. glycolysis.
- B. gluconeogenesis.
- C. gluconeogenesis.
- D. glycogenolysis.

Answer: A

Explanation:

Glycolysis is an anaerobic pathway that occurs within cells. This process converts glucose into adenosine triphosphate (for energy) and pyruvic acid. This pathway does not require oxygen. Pyruvic acid is then converted into lactic acid as a byproduct of glycolysis. This step enables additional ATP to be produced. Glycolysis produces enough energy to fuel only a few seconds to a couple of minutes of high intensity exercise such as sprinting. When lactic acid builds up in the muscles, the lactate threshold is reached and muscle pain and burning result. Glycolysis is considered an inefficient energy pathway.

Question: 9

Where does gluconeogenesis mainly occur?

- A. Mitochondria
- B. Kidney
- C. Myocyte
- D. Liver

Answer: D

Explanation:

Gluconeogenesis is the formation of glucose from fatty acids or amino acids. In this process, pyruvate is converted into glucose. This process occurs mainly in the liver but also occurs to a lesser degree in the kidneys and small intestines. The process of gluconeogenesis is stimulated by cortisol, thyroxine, and other glucocorticoids. Since the glucose is made in the liver during this process, the liver releases this glucose into the blood stream as needed such as during sleep or periods of starvation. It is an important pathway because the brain requires a large amount of glucose every day.

Question: 10

Which of the following diseases is NOT considered a cellular disease?

- A. Duchenne muscular dystrophy
- B. Type 1 diabetes
- C. Alzheimer disease
- D. Cancer

Answer: B

Explanation:

A cellular disease is one that occurs when some abnormal cells interfere with the normal functioning of the body. Cancer is one example, as evidenced by tumor growth of abnormal cells. Duchenne muscular dystrophy is an inherited disorder but is also a cellular disease. There is an abnormality within muscle cells where calcium enters the cells in an abnormal way, causing destruction of muscles. Alzheimer disease is a cellular disease that affects the neurons in the brain. Type 1 diabetes is considered an autoimmune disease, but type 2 diabetes is considered a cellular disease that affects cell membrane receptors. In obese people, there is a reduction in the number of membrane receptors for insulin that in turn causes cells in the body to be less sensitive to insulin, resulting in higher blood sugar levels.

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