AMTA MBLEx (English) - Quiz Questions with Answers

Anatomy & Physiology

1.

What does a ribosome assemble, and to create what?

Amino acids; proteins

Proteins; amino acids

Lipids; a bilayer

Proteins; muscle tissue

Correct answer: Amino acids; proteins

A ribosome is a type of organelle which assembles amino acids to create proteins. Organelles are the basic structures found in a cell that play specific roles during mitosis and interphase. Amino acids are the building blocks of proteins. In most cells, the ribosome combines amino acids into proteins, which are then stored with lipids by the Golgi apparatus. Proteins are essential for cellular function and especially important for muscular health.

Amino acids form proteins, not the other way around.

The cell membrane is composed of a lipid bilayer.

Although muscle tissue is indeed made up of proteins, the process of organizing these proteins into muscle tissue is not performed by the ribosome.

2.

Blood is composed of red and white blood cells and plasma. What is plasma mostly composed of?

Water

Gases

Electrolytes

Hormones

Correct answer: Water

Plasma is mostly composed of water. 90% of plasma is water. The remaining 10% of plasma consists of gases, hormones, electrolytes, and nutrients.

3.

Which type of sensory nerves respond to change in position and movement?

Proprioceptors

Mechanoreceptors

Nociceptors

Chemoreceptors

Correct answer: Proprioceptors

Proprioceptors respond to changes in position and movement. The main proprioceptors influenced by massage are the muscle spindle and Golgi tendon organs. Proprioceptors (and mechanoreceptors) are located in the fascia, muscles, tendons, and joints.

Soft tissue consists of four basic categories of sensory nerves:

1. ***Mechanoreceptors*** *respond to touch, pressure, and movement.*
2. ***Proprioceptors*** *respond to changes in position and movement.*
3. ***Chemoreceptors*** *respond to chemical changes such as oxygen levels and acid-base balance.*
4. ***Nociceptors*** *respond to irritation and pain.*

4.

Which of the following ligaments spans the lateral aspect of the knee from the femur to the fibula?

The LCL

The MCL

The ACL

The PCL

Correct answer: The LCL

The LCL stands for the Lateral Collateral Ligament and works to stabilize the lateral aspect of the knee. It connects the lateral side of the femur to the lateral side of the fibula.

The MCL stands for the Medial Collateral Ligament and works to stabilize the medial aspect of the knee. It connects the medial side of the femur to the medial side of the tibia. The ACL stands for Anterior Cruciate Ligament and stabilizes the joint by attaching the superior surface of the tibia (connecting to the anterior portion of that surface) to the inferior surface of the femur (towards the posterior portion of that surface). The PCL stands for Posterior Cruciate Ligament and stabilizes the joint by attaching the superior surface of the tibia (connecting to the posterior portion of that surface) to the inferior surface of the femur (towards the anterior portion of that surface). The ACL and PCL form an X-shape between the tibia and femur.

5.

Complex molecules are broken down and energy is released during:

Catabolism

Anabolism

Metabolism

Mitosis

Correct answer: Catabolism

During catabolism, complex molecules are broken down and energy is released. This is one function that falls under the umbrella of metabolism, which is the process in which energy is released or used by the cells.

Anabolism, another function of metabolism, is a chemical reaction that uses energy to join simple molecules together to form more complex molecules such as carbohydrates, lipids, proteins, and nucleic acids.

Mitosis is another word for cell division, in which the cell duplicates itself.

6.

Which of the following lymph nodes are located around one’s knees?

Popliteal nodes

Cervical nodes

Axillary nodes

Pectoral nodes

Correct answer: Popliteal nodes

The popliteal nodes are located around one’s knees. The popliteal lymph nodes, small in size and some six or seven in number, are embedded in the fat contained in the popliteal fossa, sometimes referred to as the 'knee pit'.

Cervical nodes are located around one’s neck. Axillary nodes are located around one’s armpit. Pectoral nodes are located around one’s breast.

7.

What is the function of growth hormone (GH)?

Promotes cell division and tissue repair

Contributes to parental bonding, feelings of attachment, and lactation

Contributes to mood regulation and pain modulation

Influences motor activity and elevated mood

Correct answer: Promotes cell division and tissue repair

Growth hormone (GH) stimulates most cells to divide and grow in size. This is useful for both muscle growth and the repair of damaged tissue. As we age, the total amount of GH produced by the body declines.

Oxytocin contributes to bonding and feelings of attachment, and is also important in lactation. Serotonin regulates mood and mood lifters that support satiety. Dopamine influences motor activity and mood.

8.

An individual’s thyroid can be found:

Below the larynx in the neck

Below the thalamus in the center of the brain

Below the thalamus and the hypothalamus in the center of the brain

Just above the kidneys

Correct answer: Below the larynx in the neck

An individual’s thyroid can be found below the larynx in the neck. It is contraindicated to massage directly over the thyroid. The thyroid functions as part of the endocrine system and regulates metabolism.

The hypothalamus can be found below the thalamus in the center of the brain. The pituitary gland can be found below the thalamus and the hypothalamus in the center of the brain. The adrenal glands can be found just above the kidneys.

9.

What type of pain is diffused around the site of origin, and not clearly localized?

Radiating

Phantom

Referred

Recurring

Correct answer: Radiating

Radiating pain is diffused around the site of origin, and not clearly localized.

Phantom pain is frequently experienced by clients who have undergone limb amputation. An individual with phantom pain feels as if they have pain in a body part they do not possess.

Referred pain occurs in an area distant from the site of the stimulus.

Recurring pain happens repeatedly and may occur in any area of the body.

10.

In most healthy adults, how long is the small intestine?

24–30 feet

Half the size of the large intestine

40–100 feet

Proportionally, as long as they are tall

Correct answer: 24–30 feet

In most healthy adults, the small intestine is 24–30 feet long. It is called the "small" intestine because its diameter is smaller than that of the large intestine. The small intestine is much thinner but much longer than the large intestine.

11.

Which of the following cranial nerves innervates the tongue?

Hypoglossal

Trigeminal

Trochlear

Vagus

Correct answer: Hypoglossal

The cranial nerve that innervates the tongue is the hypoglossal (XII) nerve. It arises in the medulla and contains mostly motor neurons, innervating the tongue and throat.

The cranial nerves include:

*I. **The olfactory nerves**, which transmit taste and smell information to the brain.*

*II. **The optic nerves**, which transmit visual information to the brain.*

*III. **The oculomotor nerves**, which transmit information about eye movement.*

*IV. **The trochlear nerves**, which innervate the muscles of the eyeball.*

*V. **The trigeminal nerves**, which transmit information about sensation in the head, face, and facial skin, and include motor neurons for mastication.*

*VI. **The abducens nerves**, which include both sensory and motor neurons related to eye movement.*

*VII. **The facial nerves**, which have sensory neurons for taste and motor neurons for facial expression, tear production, and salivation.*

*VIII. **The vestibulocochlear** nerves, which receive information about hearing and equilibrium.*

*IX. **The glossopharyngeal** nerves, which relate to taste, saliva production, swallowing, and the gag reflex.*

*X. **The vagus nerves**. These nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal*

muscles and the abdominal viscera. They control heart rate and other visceral activities.

*XI. **The accessory nerves** mainly contain motor neurons for speaking, turning the head, and moving the shoulders.*

*XII. **The hypoglossal nerves** contain mostly motor neurons, which innervate the tongue and throat.*

12.

Which of the following is the mechanism responsible for the movement of food along the GI tract?

Peristalsis

Concentric contraction

Mastication lubrication

Mechanical digestion

Correct answer: Peristalsis

Peristalsis is the process of pushing food along the alimentary canal. This action is performed by smooth, involuntary muscles. It is a wavelike contraction that moves food through the GI tract.

Concentric contraction is the shortening of a voluntary muscle, typically describing the skeletal musculature. Mechanical digestion is the process of converting large particles of food into small particles of food. Mastication lubrication is the process of secreting saliva while chewing food.

13.

All of the following muscles are part of the rotator cuff **except**:

Rhomboid major

Subscapularis

Infraspinatus

Supraspinatus

Correct answer: Rhomboid major

Rhomboid major is not considered to be part of the rotator cuff. This muscle originates at the spinous processes of the T2-T5. It inserts on the medial border of the scapula, between the spine and the inferior angle. Its concentric actions are retraction (adduction), elevation, and downward rotation of the scapula.

The rotator cuff consists of four muscles: subscapularis, infraspinatus, supraspinatus, and teres minor. This muscle group is sometimes referred to using the acronym "SITS."

14.

Which of the following is stored for energy and an important part of the cell membrane and also a part of the myelin sheath?

Fats

Carbohydrates

Proteins

Sugars

Correct answer: Fats

Fats are one of the major food groups, along with proteins and carbohydrates. Cell membranes and the myelin sheaths of neurons are both made up of fat. Excess fat is also stored for energy.

Carbohydrates, or sugars, are the primary source of fuel for the cell. Proteins broken down into amino acids and are used for metabolic activities. While both carbohydrates and proteins are a part of the cell membrane, and fats and proteins are part of the myelin sheath, only fat is stored for energy.

15.

What is a canal in a bone, such as the canal in the skull that runs from the external ear to the eardrum?

Meatus

Foramen

Fossa

Sinus

Correct answer: Meatus

A meatus is a tunnel or canal found in a bone, such as the canal in the skull that runs from the external ear to the eardrum.

A foramen is a rounded hole in the bone, such as the foramen of a vertebra, which allows the spinal cord to pass through the length of the spine.

A fossa is a shallow depression in the surface or at the end of the bone, such as the infraspinous fossa of the scapula.

A sinus is an air cavity in the bone. Examples include the frontal sinuses, located in the skull.

16.

Which of the following is **true** of cardiac muscle?

It is a type of muscle found in the heart.

It is a voluntary muscle.

It is a type of muscle found around blood vessels.

It is the type of muscle that allows bones to move.

Correct answer: It is a type of muscle found in the heart.

Cardiac muscle, also known as striated involuntary muscle, is found only in the heart. It contracts rhythmically and involuntarily, continually pumping blood through the heart, the lungs, and the rest of the body.

Smooth muscle is found around blood vessels. Skeletal muscle is a voluntary muscle and allows bones to move.

17.

If a client's condition relates to inflammation, what suffix would **most** likely be added to the root word?

-itis

-algia

-osis

-pnea

Correct answer: -itis

The suffix -itis means inflammation. For example, arthritis refers to the inflammation of a joint.

The suffix -algia means pain. For example, neuralgia refers to nerve pain. The suffix -osis usually refers to an abnormal condition. For example, necrosis refers to the abnormal or pathological death of cells. The suffix -pnea means breathing. For example, sleep apnea occurs when a person intermittently stops breathing while asleep.

18.

What type of bone is the cuboid?

Short bone

Flat bone

Irregular bone

Sesamoid bone

Correct answer: Short bone

The cuboid bone, which is one of the tarsals, is a short bone. Short bones have a thin cortex of compact bone and no cavity.

Flat bones are generally flatter than they are round. The ribs are flat bones. Irregular bones, such as the scapulae, have complex shapes. Sesamoid bones, like the patella, are round bones and are often embedded in tendons and joint capsules. Sesamoid bones are a subcategory of irregular bones.

19.

The muscular system’s functions include all the following **except**:

Calcium storage

Body movement

Posture and support

Movement of lymph

Correct answer: Calcium storage

Calcium storage is a function of the body’s skeletal system, not the muscular system.

The muscular system includes muscles which attach to bone. When the muscles contract, they can create movement, change the body's posture, and provide support for the joints. Muscle contraction assists in the movement of lymph through the lymphatic system of the body.

20.

Which of the following structures is **not** located in the lower respiratory system?

The pharynx

The larynx

The bronchi

The alveoli

Correct answer: The pharynx

The pharynx, or throat, is located in the upper respiratory system. It is divided into the following three sections:

1. ***The nasopharynx** is a pathway for air and a continuation of the nasal cavity.*
2. ***The oropharynx** is a pathway for food and extends back from the mouth. This is the part of the throat that is visible when a person opens their mouth, containing the tonsils.*
3. ***The laryngopharynx** is a pathway for both air and food. It begins at the hyoid bone and then separates into the esophagus and the larynx.*

The larynx (voice box) connects the pharynx to the trachea (windpipe). Both the bronchi and the alveoli are located within the lungs. The larynx, trachea, bronchi, and alveoli are all part of the lower respiratory system.

21.

Which of the following sensory nerves responds to chemical changes within the body?

Chemoreceptors

Nociceptors

Proprioceptors

Mechanoreceptors

Correct answer: Chemoreceptors

Chemoreceptors detect chemical changes within the body and report that information back to the central nervous system.

Soft tissue consists of four basic categories of sensory nerves:

1. ***Mechanoreceptors** respond to touch, pressure, and movement.*
2. ***Proprioceptors** respond to changes in position and movement.*
3. ***Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
4. ***Nociceptors** respond to irritation and pain.*

22.

Of the following, what is the **best** description of ground substance?

A gelatin-like structure that supports the fibers of fascia and is sensitive to temperature

The collagen and elastic fibers of the fascia

A gelatin-like structure that supports the fibers of fascia and is insensitive to temperature

Scar tissue

Correct answer: A gelatin-like structure that supports the fibers of fascia and is sensitive to temperature.

Ground substance is a gelatin-like structure that supports the fibers of fascia and is sensitive to temperature. This sensitivity makes it important to warm the muscles up slowly. As ground substance gets warmer, it becomes more pliable, allowing for more freedom of movement. This warm-up process is an essential part of any massage, workout, or stretching routine.

Ground substance supports the collagen and elastic fibers that are also part of the fascia. Fascia plays a role in the creation of scar tissue, but is more influenced by collagen fibers than by ground substance.

23.

Which of these options accurately describes the path blood takes through the heart?

Right atrium, right ventricle, lungs, left atrium, left ventricle, aorta

Left atrium, right ventricle, lungs, right atrium, right ventricle, aorta

Right atrium, right ventricle, aorta, left atrium, right ventricle, lungs

Left ventricle, left atrium, lungs, right ventricle, right atrium, aorta

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Correct answer: Right atrium, right ventricle, lungs, left atrium, left ventricle, aorta

The blood moves in and out of the heart in a well-coordinated and precise rhythm. After bringing oxygen to the body, the blood travels back to the heart, through the lungs (where it is oxygenated again), and back out to the body. This is the path it takes during this process, in greater detail:

Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body

24.

Where is the coracoid process found?

The scapula

The femur

The atlas

The humerus

Correct answer: The scapula

The coracoid process is a small hook-like structure on the superior aspect of the scapula. It stabilizes the shoulder joint with the acromion, it is an attachment point for the pectoralis minor muscle, and it connects with the acromion via ligament to stabilize the shoulder.

While there are other skeletal processes, the coracoid process only occurs on the scapula. The femur is a large bone found in the thigh. The atlas, or C1, is the vertebra at the top of the spine, directly inferior to the skull. The humerus is found in the arm.

25.

Where are the adrenal glands located?

The superior aspects of the kidneys

The lateral aspects of the thyroid

Deep within the brain

Within the pelvis

Correct answer: The superior aspects of the kidneys.

The adrenal glands are located on the superior aspects (tops) of the kidneys. The kidneys are in the abdomen.

The parathyroid glands are located on the lateral aspects of the thyroid. The pineal gland is located deep within the brain. In the female reproductive system, the ovaries are located within the pelvis.

26.

Which layer of the skin acts as the insulation for the body?

Subcutaneous tissue

Epidermis

Dermis

Hair follicles

Correct answer: Subcutaneous tissue

The skin is made up of three layers: epidermis, dermis, and subcutaneous tissue. The subcutaneous tissue attaches the dermis to the underlying structures. It is made up of fatty adipose tissue and acts as insulation for the body.

The epidermis is the most superficial layer of skin tissue. It contains no nerves or blood vessels and is made up of 20–30 layers of flat, keratin-filled dead cells that are continually shed and replaced by deeper layers of tissue. The dermis is deep to the epidermis and superficial to the subcutaneous tissue. The dermis is much thicker than the epidermis and provides much of the structure and strength of the skin. Individual hair follicles are located within the skin.

27.

What is the periosteum?

The dense, fibrous sheath of connective tissue that covers bones

The process of smooth muscle contraction

A thin membrane of connective tissue lining the cavity of a bone

The tough, flexible connective tissue within a joint

Correct answer: The dense, fibrous sheath of connective tissue that covers bones

The periosteum is a dense, fibrous sheath of connective tissue covering a bone. When stretched, it provides mechanoreceptor information about the location of a joint.

Peristalsis is the process of smooth muscle contraction. The endosteum is a thin membrane of connective tissue lining the cavity of a bone. Cartilage is the tough, flexible, connective tissue within a joint.

28.

In what way are the left and right lungs different?

The right lung has three lobes (upper, middle, and lower). The left lung only has two (upper and lower).

The right lung is responsible for inhalation. The left lung is responsible for exhalation.

The right lung has three lobes (anterior, posterior, and medial). The left lung only has two (anterior and medial).

The left lung has three lobes (upper, middle, and lower). The right lung only has two (upper and lower).

Correct answer: The right lung has three lobes (upper, middle, and lower). The left lung only has two (upper and lower).

The lungs are not symmetrical. The right lung has three lobes: the upper lobe, middle lobe, and lower lobe. The left lung only has upper and lower lobes. The heart sits between these two lobes on the left side.

Barring pathology, the right and left lungs are equally responsible for both inhalation and exhalation. The lobes of the lung might be described as follows: the upper (or superior) lobe; the middle lobe, and the lower (or inferior) lobe. The lobes are neither anterior nor posterior to each other. The right lung is larger than the left lung.

29.

Which of the following options **best** defines phagocytosis?

The process in which solids are engulfed by the cell membrane

The stages of blood cell development that take place in red marrow

The process in which water is diffused through a semipermeable membrane

The process in which a substance moves from a higher to a lower concentration

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Correct answer: The process in which solids are engulfed by the cell membrane

Phagocytosis is the process in which solids are engulfed by the cell membrane. It is a function of white blood cells, in which macrophages (a type of cell) engulf bacteria in a cell-eating process. This is an important function of the body's immune system in the process of fighting infection.

Hematopoiesis refers to the stages of blood cell development that take place in red marrow. Osmosis is the process in which water is diffused through a semipermeable membrane. Diffusion is the process in which a substance moves from a higher to a lower concentration.

30.

While calcium is important in healthy bones, it plays all the following roles **except**:

Movement of sodium across cell walls

Transmission of nerve impulses across synapses

Blood clotting

Muscle contraction

Correct answer: Movement of sodium across cell walls

Calcium helps to transmit nerve impulses across synapses, which is where an axon and a post-synaptic cell meet. It is also important in the processes of blood clotting and muscle contraction.

Chloride, which is an electrolyte, easily diffuses across plasma membranes. This movement is closely linked to the movement of sodium. Chloride helps regulate osmotic pressure differences and maintain the body's pH balance.

31.

Which neurotransmitter is responsible for influencing motor activity, especially fine movements?

Dopamine

Serotonin

Oxytocin

Cortisol

Correct answer: Dopamine

Dopamine influences motor activity that involves movement, especially fine motor control. It also influences mood and the ability to focus one's attention. Low dopamine levels contribute to a lack of motor control and clumsiness. Individuals who have Parkinson's disease have a lack of usable dopamine in their brains, which contributes to the motor deficits of the disease. Massage can increase the availability of dopamine in the body.

Serotonin allows a person to maintain context-appropriate behavior and regulates mood. Oxytocin is a hormone that facilitates bonding and feelings of attachment. Cortisol is a stress hormone that is produced by the adrenal glands during prolonged stress.

32.

All the following are examples of digestive secretions, **except**:

Plasma

Saliva

Bile

Pancreatic juice

Correct answer: Plasma

Plasma is a fluid found in blood and lymph. It is not a digestive secretion.

Saliva is produced by the salivary glands and lubricates the bolus of food while also facilitating the mixing of food during the chewing process.

Bile, produced by the liver, increases the pH of the bolus of food, detoxifies it of harmful substances, and dilutes it in order to facilitate further digestion.

Pancreatic juice, produced by the pancreas, digests proteins, polypeptides, lipids, and other substances.

33.

The reaction that happens within cellular processes that is responsible for the production or consumption of energy is known as:

Metabolism

Absorption

Circulation

Reproduction

Correct answer: Metabolism

Metabolism is a chemical reaction that occurs in cells to effect transformation, production, or consumption of energy. Energy comes from nutrients and is processed into ATP. The two types of chemical reactions that may take place during this process are anabolism, which uses energy to join molecules together, and catabolism, which releases energy by breaking down more complex chemical compounds.

Absorption is the transportation and use of nutrients. Circulation is the movement of fluids, nutrients, secretions, and waste from one area of the body to another. Reproduction is the formation of a new being or new cells in the body.

34.

Where is the humerus located?

The upper limb

The pelvic girdle

The lower limb

The axial skeleton

Correct answer: Upper limb

The humerus is located in the upper limb of the skeleton. The other limbs in the upper limb are the radius, ulna, carpals, metacarpals, and phalanges.

The sacrum, coccyx, and pelvic bones (also called the ilium and ischium) are located in the pelvic girdle. The femur, patella, tibia, fibula, tarsals, metatarsals, and phalanges are located in the lower limb. The axial skeleton refers to the bones located along the central axis of the body, such as the vertebrae, ribcage, and skull.

35.

Which of the following vitamins is **not** fat-soluble?

Folic acid

Vitamin A

Vitamin D

Vitamin K

Correct answer: Folic acid

Folic acid is a water-soluble vitamin that aids in the formation of hemoglobin and nucleic acids. It is found in green vegetables, legumes, nuts, fruits, and whole grains.

Vitamin A, D, E and K are all fat-soluble vitamins. Vitamin A supports mucous membrane health, skin, hair, bone development, and retinal health. Vitamin D aids in the development of bones and teeth and assists in calcium absorption. Vitamin E conserves fatty acids and protects cell membranes. Vitamin K plays an important role in blood clotting.

36.

Which nerve plexus innervates the diaphragm?

Cervical plexus

Brachial plexus

Lumbar plexus

Sacral plexus

Correct answer: Cervical plexus

The cervical plexus is formed by the ventral rami of the upper four cervical nerves. The phrenic nerve, which is part of this plexus, innervates the diaphragm. Damage to this nerve can cause breathing dysfunction, often resulting in death.

The brachial plexus innervates the skin and muscles of the upper limbs. The lumbar and sacral plexuses innervate areas of the abdomen, pelvis, and legs.

37.

Which nerve root does **not** form part of the four nerve plexuses in the body?

T8

C3

C8

L1

Correct answer: T8

The four nerve plexuses are the:

- *Cervical plexus*
- *Brachial plexus*
- *Lumbar plexus*
- *Sacral plexus*

Nerves T2-T12 do not form a plexus.

C3 is part of the cervical plexus. C8 is part of the brachial plexus. L1 is part of the lumbar plexus.

38.

What membrane of fibrous connective tissue connects the skin to the muscles and other underlying structures?

Fascial

Synovial

Serous

Mucous

Correct answer: Fascial

Fascial membranes are layers of fibrous connective tissue that connect the skin to muscles and other underlying structures.

Synovial membranes are located inside the joints and produce synovial fluid that lubricates the joints.

Serous membranes produce serous fluid, which lubricates the internal organs of the pelvic, abdominal, and thoracic cavities.

Mucous membranes produce mucus that lubricates and protects the respiratory and digestive cavities.

39.

What happens when the stretch reflex is activated?

The stretching of a muscle elicits a protective contraction of that same muscle.

The contraction of one muscle causes its antagonist to relax.

Passive stretching increases flexibility.

The act of overstretching a muscle causes pain.

Correct answer: The stretching of a muscle elicits a protective contraction of that same muscle.

When the stretch reflex is activated, the stretching of a muscle elicits a protective contraction of that same muscle. This reflex guards against muscle injury. For example, if a person trips, forcing their hip into hyperextension, they may risk injuring the joint and surrounding muscles. In this scenario, the stretch reflex would cause the hip flexors to contract, pulling the joint back into a less dangerous position.

During reciprocal inhibition, the contraction of one muscle causes its antagonist to relax. Passive stretching can indeed increase flexibility, and the act of overstretching a muscle often causes pain; however, neither of these activities can be described as a reflex.

40.

The male reproductive system includes the testicles, epididymus, vas deferens, ejaculatory duct, urethra, penis, and scrotum. What is the epididymus?

The site in which the sperm mature

The site of sperm production

The site of ejaculation

The skin covering the penis

Correct answer: The site in which the sperm mature

The epididymis is the site in which sperm mature. Sperm is produced in the testicles, after which it travels to the epididymis. It then moves through the vas deferens and into the seminal vesicles.

The urethra is a vessel that runs through the penis. This is where both urination and ejaculation occur.

The skin is known as the epidermis.

41.

What muscle is able to respond to a stimulus?

Excitable

Contractible

Conductive

Elastic

Correct answer: excitable

An excitable muscle is able to respond to a stimulus.

A contractible muscle has the ability to shorten.

A conductive muscle transmits stimuli.

An elastic muscle returns to its original resting position.

42.

Which of the following cells are responsible for the formation of bones?

Osteoblasts

Osteocytes

Osteoclasts

Osteoderm

Correct answer: Osteoblasts

Osteoblasts are the cells that are responsible for the formation of bones.

Osteocytes are the cells that are responsible for maintaining the bones and producing collagen. Osteoclasts are the cells that break down the bone. Osteoderm is not an anatomical term.

43.

What type of immunity is obtained after an individual has had a specific disease?

Acquired immunity

Allergy

Antibody

Acquired immunodeficiency

Correct answer: Acquired immunity

Acquired immunity is resistance to a specific disease developed by people who have acquired the disease. The body is able to build up antibodies to the specific antigen related to that disease.

An allergy is a state of hypersensitivity to a particular substance with an overreaction of the immune system. An antibody is an immune protein produced by the body in response to a specific antigen. Acquired immunodeficiency is a group of symptoms caused by the transmission of a virus that causes a breakdown in the immune system (such as AIDS).

44.

Which plane of the body divides the body into left and right sections?

Sagittal

Diagonal

Transverse

Coronal/frontal

Correct answer: Sagittal

The sagittal plane of the body divides the body into left and right sections.

The diagonal plane of the body is not a commonly used term. The transverse plane divides the body into superior and inferior sections. The coronal (or frontal) plane divides the body into anterior and posterior sections.

45.

If a person has a blockage in the urethra, what would they have difficulty doing?

Urinating

Defecating

Vomiting

Sweating

Correct answer: Urinating

Urination is the process of expelling urine from the body. The urethra is a tube that transports urine from the bladder to outside the body. A blockage here would cause an inability or significant difficulty with urination.

The rectum, not the urethra, is responsible for defecation. Vomiting involves the stomach and esophagus. Sweating occurs on the epidermis.

46.

Which of the following is a furrow in a bone that typically holds blood vessels, nerves, or tendons?

Groove

Sinus

Head

Meatus

Correct answer: Groove

A groove is a furrow in a bone that typically holds blood vessels, nerves, or tendons. The radial groove of the humerus is one example.

An air cavity in bone is known as a sinus (e.g., frontal sinus).

A rounded projection found on top of the neck of a bone is a head (e.g., head of the femur).

A meatus is a tunnel or canal in the bone, such as the canal in the skull that extends from the external ear to the ear canal.

47.

Varicose veins are caused by a breakdown of the:

Valve system of veins

Pump system of veins

Arterial capillaries

Valve system of the arteries

Correct answer: Valve system of veins

Varicose veins are caused by a breakdown of the valve system of the veins. The valve system prevents circulatory backflow, and so keeps blood from pooling in the lower extremities. When a person spends too much time standing, they may develop varicose veins over time. This is a common condition for people who have spent their careers working as restaurant servers, for example.

Veins themselves do not have a pump system; however, the contraction of muscles surrounding veins work as a "muscle pump" to help blood move through veins.

Arteries do not have a valve system since blood travels through them at much higher pressures.

48.

In medical terminology, which of the following Latin roots refers to the chest?

Thorac(o)

Therm(o)

Ren(o)

Phleb(o)

Correct answer: Thorac(o)

The Latin root, or prefix, "thorac(o)" refers to the chest.

The root "ren(o)" refers to the kidneys. "Therm(o)" refers to heat. "Phleb(o)" refers to the veins.

49.

The bones of the skull can be classified as cranial or facial bones. Which of the following includes examples of both a cranial bone and facial bones?

Frontal; zygomatic

Zygomatic; nasal

Sphenoid; temporal

Mandible; maxillary

Correct answer: Frontal; zygomatic

The bones of the skull can be classified as cranial or facial bones. For example, the frontal bone is a cranial bone and the zygomatic bones are facial bones. The cranial bones surround and protect the brain. The facial bones support the muscles and other structures of the face.

The cranial bones are the parietal, sphenoid, temporal, frontal, occipital, and ethmoid bones.

The facial bones are the nasal, vomer, lacrimal, zygomatic, palatine, and maxillary bones, the mandible, and the nasal conchae.

50.

Which of the following is **not** a cranial nerve?

Sciatic

Optic

Facial

Vagus

Correct answer: Sciatic

The sciatic nerve is a lumbosacral nerve, which means it arises from nerves that exit the lumbar spine and the sacrum. It innervates the posterior thigh, leg, and sole of the foot.

The cranial nerves include:

*I. **The olfactory nerves**, which transmit taste and smell information to the brain.*

*II. **The optic nerves**, which transmit visual information to the brain.*

*III. **The oculomotor nerves**, which transmit information about eye movement.*

*IV. **The trochlear nerves**, which innervate the muscles of the eyeball.*

*V. **The trigeminal nerves**, which transmit information about sensation in the head, face, and facial skin, and include motor neurons for mastication.*

*VI. **The abducens nerves**, which include both sensory and motor neurons related to eye movement.*

*VII. **The facial nerves**, which have sensory neurons for taste and motor neurons for facial expression, tear production, and salivation.*

*VIII. **The vestibulocochlear nerves**, which receive information about hearing and equilibrium.*

*IX. **The glossopharyngeal nerves**, which relate to taste, saliva production, swallowing, and the gag reflex.*

*X. **The vagus nerves**. These nerves contain sensory neurons for the pharynx, larynx, trachea, heart, carotid body, lungs, bronchi, esophagus, stomach, small intestine, and gallbladder. Their motor neurons carry impulses to the pharyngeal and laryngeal*

muscles and the abdominal viscera. They control heart rate and other visceral activities.

*XI. **The accessory nerves** mainly contain motor neurons for speaking, turning the head, and moving the shoulders.*

*XII. **The hypoglossal nerves** contain mostly motor neurons, which innervate the tongue and throat.*

51.

The autonomic nervous system (ANS) is divided into the sympathetic nervous system and the parasympathetic nervous system. Of the following options, which one is a sign that the parasympathetic nervous system is responding to stimuli?

The individual's digestive system moves appropriately

The individual's heart rate rapidly increases

The individual starts perspiring

The individual notices a heightened state of awareness

Correct answer: The individual's digestive system moves appropriately

Normal digestive activity is controlled by the parasympathetic nervous system. The sympathetic nervous system activates the arousal responses of the "fight or flight" state. The parasympathetic nervous system reverses the actions of the sympathetic nervous system by returning the body to a non-alarm state, restoring "rest and digest" functions.

A sympathetic response might result in increased heart rate, perspiration, and/or a heightened state of awareness.

52.

What is the term for a cutaneous part of the body supplied by a single nerve?

Dermatome

Myotome

Limb

Plexus

Correct answer: Dermatome

A dermatome is a cutaneous part of the body (i.e., a section of the skin) supplied by a single nerve. There is some overlap between dermatomal patterns. General knowledge of dermatomes enables massage therapists to locate injuries in the spinal column, even when they present with distal pain.

A myotome is a skeletal muscle that is, or group of muscles that are, innervated by a specific spinal nerve. A limb is part of the axial skeleton; each limb has multiple dermatomes. A plexus is a network of intertwining nerves, such as the cranial plexus.

53.

Where in the digestive system is the solid waste stored?

Rectum

Anus

Ascending colon

Peristalsis

Correct answer: Rectum

The solid waste is stored in the rectum and part of the large intestine.

The anus is where the sphincter valve controls defecation. The ascending colon is part of the large intestine, running up the right side of the abdomen to the underside of the liver; it receives digested matter from the cecum, which connects directly to the small intestine. Peristalsis is the process of pushing food along the alimentary canal.

54.

Which of the following tissues is **not** a type of muscle tissue?

Hyaline cartilage

Skeletal

Smooth

Cardiac

Correct answer: Hyaline cartilage

There are two main types of cartilage: hyaline cartilage and fibrocartilage. Hyaline cartilage is found on the articulating surfaces of joints, between the ribs, and in the respiratory system. White fibrocartilage is found between the articulating surfaces of joints, such as the knee. This elastic substance is not a type of muscle tissue.

Skeletal muscles attach to the bones of the skeleton and move the joints. Smooth muscle is primarily found in the digestive system. Cardiac muscle is found only in the heart.

55.

Which of the following cellular functions is responsible for the production of egg and sperm cells?

Meiosis

Mitosis

Cell division

Interphase

Correct answer: Meiosis

Meiosis is a specialized form of cell division. During this process, the number of chromosomes is halved before being reproduced in a new cell. Meiosis results in the creation of ova or sperm cells, used in the reproductive process.

Mitosis is another word for cell division. Meiosis is a specialized kind of mitosis. Interphase is the stage in a cell's life cycle when it carries out most of its activities; this period of time does not include cell division.

56.

A client is having pain along the tip of his shoulder, and it continues along the posterior aspect of the upper arm to the dorsum of the lower arm and hand and into the pointer and middle fingers. What dermatome is involved?

C7

C5

C6

C8

Correct answer: C7

Pain along the tip of the shoulder, continuing along the posterior aspect of the upper arm and into the dorsum of the lower arm, reaching the pointer and middle fingers follows the path of the C7 dermatome. The easiest way to identify pain as being in the C7 dermatome is by determining which fingers are involved.

The C5 dermatome travels along the volar (anterior) aspect of the lower arm and does not travel into the hand. The C6 dermatome travels into the thumb, while the C8 dermatome travels into the ring and pinky fingers.

57.

Which of the following serves as a reservoir for urine?

Urinary bladder

Kidney

Ureter

Urethra

Correct answer: Urinary bladder

The urinary bladder serves as a reservoir for urine. It is a muscular, bag-like organ that lies in the pelvis.

Urine is produced in the kidneys. The ureters transport urine from the kidneys to the bladder. The urethra carries urine to the exterior of the body.

58.

Which important area of the brain regulates essential functions of heart rate, respiration, and blood pressure?

Medulla oblongata

Midbrain

Cerebellum

Temporal lobe

Correct answer: Medulla oblongata

The medulla oblongata connects the pons with the spinal cord. It contains the cardiac center (which regulates heartbeat), the vasomotor center (which regulates blood pressure), and the respiratory center (which regulates breathing).

The midbrain, or mesencephalon, correlates information about posture with auditory and visual reflexes. The cerebellum is the second-largest segment of the brain. It contains centers for balance, equilibrium, muscular coordination, posture, and balance. It also controls subconscious movements of skeletal muscle and receives input from proprioceptors. The temporal lobe is responsible for hearing and smell.

59.

Which of the following is **not** a system of the body?

Cranial

Muscular

Cardiovascular

Respiratory

Correct answer: Cranial

The cranium, or skull, contains the brain. This is an adjective used to refer to an area of the body, but not a system of the body.

There are 11 systems of the human body: the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic and immune, respiratory, digestive, urinary (renal), and reproductive systems.

60.

What produce(s) a hormone that lowers calcium levels in the blood, and what is this hormone called?

Thyroid; calcitonin

Posterior pituitary gland; oxytocin

Adrenal glands; norepinephrine

Thyroid; thyroxine

Correct answer: Thyroid; calcitonin

The thyroid produces a hormone that lowers calcium levels in the blood. This hormone is called calcitonin. It decreases levels of blood calcium by inhibiting the release of calcium and potassium from the bones.

The thyroid also produces thyroxine and triiodothyronine, which regulate the body's metabolism by maintaining an appropriate level of oxygen consumption on a cellular level.

The posterior pituitary gland produces oxytocin, which stimulates positive emotions and regulates lactation.

The adrenal glands produce norepinephrine (or noradrenaline) in response to stress.

61.

Which glands of the endocrine system are located on top of each kidney?

Adrenal

Thyroid

Pituitary

Pineal

Correct answer: Adrenal

There are two adrenal glands, each located on top of each kidney. Each gland consists of an outer layer called the cortex and an inner area called the medulla. They produce adrenaline (or epinephrine), noradrenaline (or norepinephrine) and cortisol.

The thyroid is located below the larynx in the neck. The pituitary gland is located beneath the thalamus and the hypothalamus in the center of the brain. The pineal gland is the small gland that is located in the midbrain of the brainstem.

62.

What does the enteric nervous system innervate?

The gallbladder, pancreas, and gastrointestinal tract

The heart and lungs

The kidneys and bladder

Skin

Correct answer: The gallbladder, pancreas, and gastrointestinal tract

The enteric nervous system is a division of the autonomic nervous system and innervates the gallbladder, pancreas, and gastrointestinal tract. It can act independently of the sympathetic and parasympathetic nervous systems. It is sometimes referred to as the "belly brain."

The heart and lungs, and the kidneys and bladder, are all innervated by the autonomic nervous system, but not the enteric nervous system. The skin is innervated by the somatic nervous system.

63.

What is the function of the coronary arteries?

To bring oxygen-rich blood to the cardiac muscle

To deliver blood to the heart for oxygenation

To bring oxygen-rich blood directly from the lungs to the cardiac muscle

To bring oxygen-rich blood from the heart to the lungs

Correct answer: To bring oxygen-rich blood to the cardiac muscle.

Coronary arteries bring oxygen-rich blood to the cardiac muscle, providing oxygen to the cells that make up the heart. They originate at the base of the aorta.

The venous system, including coronary veins, delivers blood to the heart. The heart pumps blood to the lungs for oxygenation. The coronary arteries are not directly connected to the lungs. The pulmonary arteries bring oxygen-poor blood from the heart to the lungs; oxygen-rich blood does not travel from the heart to the lungs.

64.

The abdominal region is divided into four quadrants: right upper quadrant, left upper quadrant, right lower quadrant and the left lower quadrant. Which quadrant holds the appendix?

Right lower quadrant

Right upper quadrant

Left lower quadrant

Left upper quadrant

Correct answer: Right lower quadrant

The right lower quadrant extends from the median plane to the right and from the umbilical plane to the right inguinal ligament. Pain in the right lower quadrant could be a red flag for appendicitis as the appendix is found within the right lower quadrant.

The right upper quadrant contains structures such as the liver, gallbladder and head of pancreas. The left upper quadrant contains structures such as the stomach and spleen. The left lower quadrant contains the descending colon and left ureter.

65.

Which of the following planes of the body divides the body into *equal* left and right halves, running down the middle of the body?

Midsagittal

Coronal

Transverse

Frontal

Correct answer: Midsagittal

The midsagittal plane divides the body into equal left and right halves.

The coronal plane, also known as the frontal plane. divides the body into front and back halves. The transverse plane divides the body into upper and lower halves.

66.

Which of the following organ systems is responsible for the body's ability to produce hormones?

Endocrine system

Muscular system

Respiratory system

Integumentary system

Correct answer: Endocrine system

The endocrine system is composed of glands which are responsible for the body's ability to produce hormones. These hormones regulate physiological functions in an effort to maintain homeostasis. Each hormone has a specific purpose, and serves to either stimulate or inhibit a particular function of the cells.

The muscular system is responsible for the body's ability to move. The respiratory system, which includes the lungs, is responsible for the body's ability to breathe and make use of oxygen. The integumentary system, which includes the skin, is responsible for many functions, including the regulation of temperature and protection from the contraction of pathogens.

67.

Which of the following is **not** found in a female's reproductive system?

Epididymis

Cervix

Fallopian tube

Mammary glands

Correct answer: Epididymis

The epididymis is found in a male's reproductive system, not a female's reproductive system. It is a highly convoluted duct behind the testes, where sperm mature and then pass to the vas deferens.

The structures in a female's reproductive system include the ovaries, fallopian tubes, uterus, cervix, vagina, vestibular glands, mammary glands, and vulva.

The structures in a male's reproductive system include the penis, scrotum, testes, epididymis, vas deferens, seminal vesicles, prostate gland, and bulbourethral gland.

68.

What is the process of energy loss caused by friction when tissues are loaded and unloaded?

Hysteresis

Creep

Load

Thixotropy

Correct answer: Hysteresis

Hysteresis is the process of energy loss caused by friction when tissues are loaded and unloaded. The tissues produce heat as they are loaded and unloaded, which happens with on-and-off pressure. Creating hysteresis reduces stiffness and improves tissue extensibility.

Creep is the continued deformation of a viscoelastic material under constant load. Load is the degree of force applied to a particular area. Thixotropy is a quality of colloids, in which rapid force increases the rigidity of the tissue.

69.

The peripheral nervous system is composed of which of the following?

The spinal nerves and cranial nerves

The brain and spinal cord

The brain and cranial nerves

The spinal cord and spinal nerves

Correct answer: The spinal nerves and cranial nerves

The peripheral nervous system is composed of spinal nerves and cranial nerves. It includes 12 pairs of cranial nerves and 31 pairs of spinal nerves. It is divided into the somatic nervous system and the autonomic nervous system.

The central nervous system is composed of the brain, the spinal cord, and the meninges. The meninges are three layers of connective tissue that cover and protect the brain and spinal cord.

70.

If a patient is complaining of pain and tingling in the hand, which nerve plexus may have nerve damage or irritation?

Brachial plexus

Lumbar plexus

Sacral plexus

Carpal plexus

Correct answer: Brachial plexus

The brachial plexus comprises nerves that are responsible for innervation of the hand. Irritation to this plexus could result in pain, numbness, or tingling into the hand. The brachial plexus is a network of nerves formed by C5-C8 and T1 (lower four cervical nerves and the first thoracic nerve). It passes through the anterior neck, over the first rib, and into the axillary region. Compression or irritation of part of the plexus can result in an abnormal sensation in the area that is innervated.

71.

You accidentally touch a hot stove, and quickly pull your hand away. What sort of reflex causes this action to occur?

Withdrawal reflex

Righting reflex

Arthrokinetic reflex

Stretch reflex

Correct answer: Withdrawal reflex

The withdrawal reflex is a protective response in which instantaneous muscle contraction occurs for protection. When a person touches a hot stove, the withdrawal reflex is activated to quickly pull their hand back and avoid further injury.

The righting reflex and the oculopelvic reflexes stimulate instantaneous contraction for joint protection and support an upright posture. The arthrokinetic reflex is the unconscious contraction of the muscles surrounding a joint in response to irritation. This is also known as splinting. The stretch reflex (such as the patellar tendon reflex) is a protective reflex that reacts to the quick stretch of a muscle or tendon, causing that same structure to contract in order to avoid injury.

72.

Which of the following is **not** contained or embedded within the dermis?

Nails

Connective tissue

Hair follicles

Glands

Correct answer: Nails

Nails are not contained within the dermis.

The dermis is located below the epidermis. The dermis is made of connective tissue and contains lymphatic vessels, blood vessels, hair follicles, and sweat glands.

73.

The popliteal fossa is an endangerment site, in which the popliteal artery or nerve could be damaged by a massage. Where is the popliteal area located?

The posterior knee

The stomach

The elbow

The back of the neck

Correct answer: Posterior knee

The popliteal fossa is another term for the posterior knee. This is an endangerment site for the popliteal artery and vein and the tibial nerve. As such, it should usually be avoided during massage.

The umbilicus, or stomach area, is an endangerment site for the aorta. The medial epicondyle of the humerus, located in the elbow joint, is an endangerment site for the ulnar nerve, radial artery, and ulnar artery. The lateral epicondyle of the humerus, located in the elbow joint, is an endangerment site for the radial nerve. The posterior triangle of the neck, or back of the neck, is an endangerment site for the brachial plexus, the brachiocephalic artery and vein superior to the clavicle, and the subclavian arteries and vein.

74.

Which type of sensory nerves respond to touch, pressure, and movement?

Mechanoreceptors

Proprioceptors

Chemoreceptors

Nociceptors

Correct answer: Mechanoreceptors

Mechanoreceptors respond to changes in position and movement. They are typically located in fascia, muscles, tendons, and joints.

Soft tissue consists of four basic categories of sensory nerves:

1. ***Mechanoreceptors** respond to touch, pressure, and movement.*
2. ***Proprioceptors** respond to changes in position and movement.*
3. ***Chemoreceptors** respond to chemical changes such as oxygen levels and acid-base balance.*
4. ***Nociceptors** respond to irritation and pain.*

75.

The small blood vessels that branch from the arteries are known as:

Arterioles

Veins

Venules

Capillaries

Correct answer: Arterioles

Arterioles are the small blood vessels that branch from the arteries. They are the smallest arteries. They enter the tissues and branch into capillaries, supplying the cells of the body with oxygen.

Capillaries connect with both arterioles and venules, and function as the bridge between the arterial and venous systems. Venules are the small blood vessels that branch from the veins. Veins carry deoxygenated blood back to the heart.

76.

Which of the following is not a smooth or cardiac muscle?

Rectus femoris

Heart

Intestine

Bladder

Correct answer: Rectus femoris

The rectus femoris is a skeletal muscle.

The heart is a cardiac muscle.

Smooth muscles are involuntary and include the blood vessels, stomach, intestine, and bladder.

77.

All of the following statements are true of fascia **except:**

It is a network of connective tissue that protects muscles from inflammation.

It is a network of collagen and elastic fibers.

It is a network of fibers embedded in ground substance.

It is a network of fibers found throughout the body, supporting various kinds of tissue.

Correct answer: It is a network of connective tissue that protects muscles from inflammation.

Fascia does not protect muscles from inflammation. On the contrary, fascia is a major location of inflammatory processes.

Fascia is a network of connective tissue made up of collagen and elastic fibers embedded in ground substance. It is found throughout the body, and it supports many kinds of tissue. For example, layers of fascia surround every muscle as well as every individual muscle cell. It also supports the viscera.

78.

If a massage is applied directly over the medial epicondyle of the humerus, what does the massage therapist risk damaging or irritating?

Ulnar nerve, ulnar artery, and radial artery

Radial nerve

Sciatic nerve

Umbilicus

Correct answer: medial epicondyle of the humerus; ulnar nerve, ulnar artery, and radial artery

If a massage is applied directly over the medial epicondyle of the humerus, the massage therapist risks damaging or irritating the ulnar nerve, ulnar artery, and radial artery.

Massaging directly over the lateral epicondyle of the humerus endangers the radial nerve.

To avoid aggravating the sciatic nerve, the therapist must take care massaging around the gluteal region and along the path of the sciatic nerve.

Direct pressure or manipulation around the umbilicus can potentially cause discomfort or irritation, especially if the technique is too forceful or if the person has a medical condition affecting this area. Care should be taken to avoid excessive pressure or manipulation directly on the umbilicus to prevent discomfort or injury.

79.

Which of the following is **not** considered fascia?

Cartilage

Retinacula

Muscle envelopes

Dura mater

Correct answer: Cartilage

Fascia can be described as is the soft tissue component of the connective tissue system that permeates the human body. There are many body structures that can be considered types of fascia including septa, muscle envelopes, joint capsules, retinacula, dura mater, periosteum, perineurium, organ capsules, and bronchial connective tissue.

The fascial network does not include the skin, cartilage or bones. Cartilage is part of the skeletal system.

80.

Smooth muscle tissue is responsible for the contraction of all the following **except**:

Heart

Uterus

Intestines

Blood vessels

Correct answer: Heart

Cardiac muscle tissue, not smooth muscle tissue, is responsible for the contraction of the heart.

Smooth muscle tissue is responsible for the contraction of the uterus, bladder, diaphragm, intestines, and blood vessels.

81.

If a client has lost voluntary control over the movement of his body parts, which body system is **not** functioning appropriately?

Nervous system

Skeletal system

Endocrine system

Integumentary system

Correct answer: Nervous system

If a client has lost control over his body parts, his nervous system is not functioning appropriately. The nervous system is responsible for the communication of stimuli and control of responses. For example, a stroke (which is one form of injury to the brain) may cause a client to lose control over the actions of his body.

The skeletal and muscular systems are responsible for framework and movement. The endocrine system is primarily responsible for regulating hormones in the effort to maintain homeostasis. The integumentary system, which includes the skin, contains protective membranes, sensory receptors, and similar structures.

82.

Regarding lung volume, what is the vital capacity of a normal, healthy adult?

3.5 to 5.5 liters of air

0.5 to 2 liters of air

2 to 3 liters of air

5.5 to 7.5 liters of air

Correct answer: 3 to 5 liters of air

The vital capacity of air for a normal, healthy adult is 3.5 to 5.5 liters of air. This is the combined total of: the amount they inhale during a single breath (tidal volume); the amount they can forcefully inhale following a normal breath (inspiratory reserve volume); and the amount they can forcefully exhale after a normal exhalation (expiratory reserve volume). These amounts may be decreased in people with respiratory diseases such as asthma and emphysema.

83.

What is a motor unit?

A single motor neuron and all the muscle fibers it controls

A motor neuron

A group of muscles working together to perform an action, stimulated by motor neurons

The muscle that controls an action, also known as a mover.

Correct answer: A single motor neuron and all the muscle fibers it controls.

A motor unit consists of a single motor neuron and all the muscle fibers it controls.

While a motor neuron is part of each motor unit, the term "motor unit" includes the fibers it innervates. Groups of muscles that regularly work together have unique names, such as the hip flexors or the rotator cuff of the shoulder. The mover, or the muscle that controls an action, is the agonist.

84.

Which anatomical organ is the largest?

The skin

Muscular tissue

The small intestine

A church organ

Correct answer: The skin

The skin is the largest organ of the body. It is made of three layers of tissue, including the epidermis, dermis and the subcutaneous tissue. It serves to protect the body from injury and infection, as well as controlling body temperature.

There is a great deal of muscular tissue in the body, but the muscular system is not considered to be one single organ. The small intestine is a long organ that completes digestion, absorbs nutrients and water, and digests proteins, sugars and starches. A church organ is not an anatomical structure.

85.

Which of the following are located in the lower extremity?

Tarsals and metatarsals

Carpals and metacarpals

Carpals and phalanges

Tarsals and carpals

Correct answer: Tarsals and metatarsals

The tarsals and metatarsals are located in the lower extremity. The tarsal bones are located in the ankle. They attach to the metatarsal bones, which make up the instep of the foot.

The carpal and metacarpal bones are located in the wrist and hand.

Both the hand and foot contain phalanges, which are the bones of the fingers and toes.

86.

How many pairs of spinal nerves are there, and how many of those are thoracic?

31 pairs; 12 pairs

24 pairs; 12 pairs

31 pairs; 8 pairs

24 pairs; 8 pairs

Correct answer: 31; 12

There are 31 pairs of spinal nerves, of which 12 pairs are thoracic. The spinal nerves are organized as follows:

- *8 cervical*
- *12 thoracic*
- *5 lumbar*
- *5 sacral*
- *1 coccygeal*

Spinal nerves are easily associated with the vertebrae near which they originate. They contain both motor and sensory neurons.

87.

What is the main difference between hormones and neurotransmitters?

Location

Function

Chemical makeup

Half-life

Correct answer: Location

The main difference between hormones and neurotransmitters is location. When they are found in the bloodstream or in a tissue, they are called hormones. When they are found in synapses, they are referred to as neurotransmitters.

The same chemical may function as both a neurotransmitter and a hormone if it is found in both the tissue of the body and between nerve synapses. Therefore, the function, chemical makeup, and half-life of a chemical have no bearing on whether it is identified as a hormone or a neurotransmitter.

88.

Which of the following is **not** a function of the reproductive system?

Peristalsis

Production of gametes

Production of eggs

Production of sperm

Correct answer: Peristalsis

Peristalsis is the rhythmic contraction of smooth muscle that occurs in the digestive system. This is not a function of the reproductive system.

The reproductive systems of both males and females produce gametes, which are cells with half the DNA of their parent cells. In females, the gametes are eggs, or ova. In males, the gametes take the form of sperm.

89.

Which part of the brain is responsible for controlling one’s concentration, planning and problem-solving?

Frontal lobe

Temporal lobe

Occipital lobe

Postcentral gyrus

Correct answer: Frontal lobe

The frontal lobe is the anterior area of the brain, positioned behind the frontal bone. It controls voluntary skeletal muscles in the precentral gyrus. In addition, it is essential for functions of problem-solving which involve planning and higher levels of concentration.

The temporal lobe is responsible for hearing and smell. The occipital lobe is responsible for eyesight. The postcentral gyrus is responsible for sensing temperature, pressure, touch, and pain.

90.

The pulmonary artery and aorta are:

Elastic arteries

Part of the venous system

Arterioles

Capillaries

Correct answer: Elastic arteries

The pulmonary artery and the aorta are elastic arteries. This means they are large arteries with thick walls, capable of undergoing passive stretching. The arteries closest to the heart need to be larger than other arteries, so they can accommodate more blood at one time.

Arterioles are the smallest of arteries, and are found further away from the heart.

Capillaries are some of the tiny blood vessels located between arterioles and venules.

The venous system includes the veins; arteries are part of the arterial system. Both the venous system and the arterial system are part of the cardiovascular system.

91.

A massage therapist encounters a person who fell and hit the posterior aspect of their head resulting in a brain injury. What portion of the brain is **most** likely affected, and what would the person likely have difficulty with?

The occipital lobe; vision

The occipital lobe; speech

The parietal lobe; sensation

The parietal lobe; vision

Correct answer: The occipital lobe; vision

The occipital lobe makes up the posterior aspect of the brain; therefore, if a person were to hit the back of their head, it would most likely result in an injury to this lobe. The occipital lobe is involved in vision; therefore, the person would likely have difficulty in this area.

The parietal lobe makes up the area just anterior and superior to the occipital lobe and would most likely not be affected by a blow to the back of the head. The parietal lobe is involved in sensation.

92.

Regarding neurotransmitter physiology, which neurotransmitter regulates mood and produces a sense of calm and comfort?

Serotonin

Epinephrine

Oxytocin

Cortisol

Correct answer: Serotonin

Serotonin is a neurotransmitter that allows a person to perform context-appropriate behaviors. It regulates mood and produces a sense of calm and comfort. It also regulates satiety in regard to such behaviors as eating and sex. Low serotonin levels are often associated with depression, impulsive behavior, and eating disorders. Massage appears to increase serotonin levels.

Epinephrine is produced as an immediate response to stress, activating the body's fight/flight response. Oxytocin is a hormone associated with feelings of attachment and empathy. Cortisol is a stress hormone that increases sympathetic arousal, and is produced during prolonged periods of stress.

93.

Which tissue is responsible for connecting muscle to bone?

Tendon

Ligament

Fascia

Cartilage

Correct answer: Tendon

Tendons are tissues that are responsible for connecting muscle to bone. Tendons are found at the end of a muscle belly.

Ligaments are short bands of tough, flexible, fibrous connective tissue that connect two bones or cartilages or hold together a joint. Fascia is connective tissue responsible for lining muscles, vessels, and nerves. Cartilage is the tissue that is responsible for cushioning joints and reducing friction between bones.

94.

Osteoblast cells are found in the skeletal system. What is their function?

To build bone

To build cartilage

To maintain bone

To produce blood cells

Correct answer: To build bone

Osteoblasts build bone during the ossification (or calcification) process.

Chondroblasts create the cartilage model of the bones. Osteoclasts are mature bone cells, which maintain the bone after it has formed. Red marrow, found at the ends of long bones and the center of certain other bones, produces blood cells.

95.

Where does movement of the skeletal system occur?

Joints

Muscles

Nerves

Bones

Correct answer: Joints

A joint is a place where two or more bones articulate with each other. Skeletal movement occurs at joints (although not all joints allow for movement).

Muscles generate movement in the skeletal system. Nerves innervate the tissues of the body and send messages from the brain to the muscles, initiating movement. The bones provide structural stability and act as moving parts.

96.

Regarding the reproductive system, how long is the gestational period for women?

38–40 weeks

34–36 weeks

44–46 weeks

32–34 weeks

Correct answer: 38–40 weeks

The full gestational period for humans is 38–40 weeks and is divided into three trimesters. It is important for a massage therapist to understand the varying trimesters of pregnancy in order to ensure safe and appropriate massage techniques for an expecting woman.

- *The first trimester is a time of radical hormonal changes and changes in the mother, which may cause moodiness, fatigue, and nausea.*
- *The second trimester is a time of increased blood volume and increased appetite.*
- *The third trimester often includes postural changes and often discomfort.*

97.

Fascia is connective tissue that:

Supports and lines muscles, vessels, and nerves

Is made of liquid, blood cells, and plasma

Connects muscles to bones

Is located in the ears, nose, and joints

Correct answer: Supports and lines muscles, vessels, and nerves

Fascia is the connective tissue that supports and lines muscles, vessels, and nerves. Fascia is a fibrous membrane. Because fascia both surrounds and is found inside every muscle, fascial release is an important massage technique.

Blood is the connective tissue that is made of liquid, blood cells, and plasma.

A tendon is a connective tissue that connects the muscles to the bones.

Cartilage is the connective tissue that is located in the ears, nose, and joints.