FSMTB MBLEx - Quiz Questions with Answers

Anatomy & Physiology

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1.

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.

2.

What is the **most** accurate term for the windpipe?

Trachea

Larynx

Pharynx

Sinus

Correct answer: Trachea

The trachea, also called the windpipe, is located in the lower respiratory tract. The lower respiratory tract includes:

1. ***The larynx** (voice box), which connects the pharynx to the trachea (windpipe).*
2. ***The trachea** (windpipe), which is the main airway to the lungs, extending from the glottis to the junction of the two main bronchi.*
3. ***The bronchi and alveoli**, which are within the lungs themselves. The bronchi are tubes which branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.*

The pharynx is part of the upper respiratory system, and includes the nasopharynx, the oropharynx, and the laryngopharynx.

The sinuses are air-filled spaces located in the skull.

3.

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.

4.

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.

5.

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.

6.

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.

7.

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.

8.

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.

9.

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.

10.

Where does the sciatic nerve arise?

L4-S3

L3-L4

The ventral surface of the brain

C5-C8

Correct answer: L4-S3

The sciatic nerve arises from the nerves which exit the spine from L4-S3.

The femoral nerve arises from the nerves exiting the spine from L3-L4. The cranial nerves originate from the ventral surface of the brain. The axillary nerve arises from the nerves exiting the spine from C6-C8.

11.

A person deficient in iron and vitamin K might have difficulty with:

The formation of new red blood cells and the blood clotting process

The formation of new white blood cells and the ability to fight infections

The formation of new plasma and dehydration

The formation of new lymphocytes and allergic reactions

Correct answer: The formation of new red blood cells and the blood clotting process

Iron is very important in the formation of new red blood cells, and vitamin K is very important in the blood clotting process. A low level of red blood cells is known as anemia. Difficulty in the clotting process is known as hemophilia.

White blood cell production is not affected by iron or vitamin K. They are involved in the body's immune response.

Plasma is 90% water and most affected by water intake.

Lymphocytes are a type of white blood cell.

12.

Which of the following options **best** identifies the pathway of blood through the heart from the body?

Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs

Lungs > Pulmonary vein > Left Atrium (LA) > Bicuspid valve > Left Ventricle (LV) > Aortic semilunar valve > Aorta > Body

Body > Pulmonary vein > Left Ventricle (LV) > Bicuspid valve > Left Atrium (LA) > Aortic semilunar valve > Aorta > Lungs

Lungs > Vena cava > Right Ventricle (RV) > Tricuspid valve > Right Atrium (RA) > Pulmonic valve > Pulmonary arteries > Body

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Correct answer: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs

The pathway of blood through the heart from the body is as follows: Body > Vena cava > Right Atrium (RA) > Tricuspid valve > Right Ventricle (RV) > Pulmonic valve > Pulmonary arteries > Lungs.

The pathway of blood through the heart from the lungs is as follows: Lungs > Pulmonary vein > Left Atrium (LA) > Mitral valve > Left Ventricle (LV) > Aortic valve > Aorta > Body.

13.

When does vasoconstriction occur?

Any type of blood vessel contracts, getting smaller inside

A vein contracts, getting smaller inside

A vein forcibly contracts, pumping blood to the extremities

Any type of blood vessel expands, getting larger inside

Correct answer: Any type of blood vessel contracts, getting smaller inside

Vasoconstriction occurs when any type of blood vessel constricts, getting smaller inside. When this happens in response to inflammation, it is quickly followed by vasodilation, during which the inside of a blood vessel enlarges, flooding the capillary network with arterial blood.

Any type of blood vessel can undergo vasoconstriction. This can occur anywhere in the body, not only in order to bring blood to the extremities.

14.

If a client is unable to close their lips, which muscle is **most** likely damaged?

Orbicularis oris

Masseter

Orbicularis oculi

Buccinator

Correct answer: Orbicularis oris

If a client is unable to close their lips, it is likely that the orbicularis oris muscle has been damaged. This muscle inserts at the modiolus, which is a fibromuscular mass at the corners of the mouth. It inserts at the skin and fascia of the lips. Its concentric actions are to close the mouth, protract the lips (causing them to protrude anteriorly), and draw the angle of the mouth medially.

The masseter plays a major role in chewing by elevating the mandible at the TMJ. Orbicularis oculi concentrically closes and squints the eye, depresses the upper eyelid, and elevates the lower eyelid. The buccinator muscle concentrically compresses the cheek against the teeth.

15.

What cranial nerve affects the function of visceral organs?

Vagus nerve

Trochlear nerve

Trigeminal nerve

Facial nerve

Correct answer: Vagus nerves

The vagus 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.

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.*

16.

Which of the following actions does the sternocleidomastoid muscle perform?

Neck flexion and rotation

Lower jaw depression

Mandible elevation

Cheek movement

Correct answer: Neck flexion and rotation

The sternocleidomastoid muscle is responsible for neck flexion and contralateral rotation (rotation to the opposite side). It originates at the manubrium of the sternum and the superior border of the medial third of the clavicle. It inserts on the superior surface of the mastoid process and the superior nuchal line of the occiput.

The platysma muscle is responsible for lower jaw depression. The masseter muscle is responsible for mandible elevation. The buccinator muscle is responsible for cheek movement.

17.

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.

18.

A spinal cord injury at what level would still allow a person to continue breathing on their own?

Below C5

C2-C3

Above C3

C2

Correct answer: Below C5

The diaphragm is the primary muscle responsible for breathing. It is innervated by the phrenic nerve which originates from C3-C5. Injury at or above this level would result in severe difficulty or complete inability to breathe on one's own. Think, "Stayin' alive, C3, 4, 5!"

Any injury to the level C5 or above would result in severe difficulty or inability to breathe since the signal for the phrenic nerve must travel through C1-C5 to carry the signal to the diaphragm. Spinal injuries at or inferior to the level of C6 do not necessarily inhibit breathing.

19.

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.

20.

The vestibular system is essential in determining and reporting the head's position and direction of movement. Where are the vestibular sensors located?

Inner ear

Nasal passages

Within the eyes

Cervical plexus

Correct answer: Inner ear

The vestibular sensors are located within the inner ear and continuously monitor head movements. They then report the head position, direction, and movement to the brain. These sensors also function to control movement of the eyes and compensate for movement of the head, thereby stabilizing vision.

21.

Which of the following is a serous membrane that lines the abdominal cavity and prevents friction?

Peritoneum

Periosteum

Omentum

Epididymus

Correct answer: Peritoneum

The peritoneum is a serous membrane that lines the abdominal cavity and prevents friction. It secretes serous fluid that works as a lubricant and protects the abdominal organs. The abdominal cavity contains the major organs of digestion. The digestive tract consists of the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus.

The periosteum is a thin membrane of connective tissue that covers certain portions of the bones.

The omentum is a support structure in the abdominal cavity that surrounds the intestinal organs, protecting them from inflammation and infection.

The epididymus is part of the male reproductive system.

22.

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.

23.

Which of the following is **true** of the respiratory system?

It exchanges oxygen and carbon dioxide within the cells of the body.

It exchanges carbon dioxide and oxygen within the lungs.

It is responsible for ingesting oxygen.

It produces oxygen and excretes carbon dioxide.

Correct answer: It exchanges oxygen and carbon dioxide within the cells of the body.

The respiratory system supplies oxygen to and removes carbon dioxide from the cells of the body. This takes place during internal respiration. Respiration is divided into two phases:

1. ***External respiration** occurs as the lungs absorb oxygen from the air outside the body (inhalation) and transport carbon dioxide cells back out into the environment (exhalation).*
2. ***Internal respiration** occurs when the respiratory system exchanges oxygen and carbon dioxide within the body's cells.*

It is inaccurate to say that carbon dioxide and oxygen are exchanged within the lungs. The exchange of these gases occurs within individual cells; the lungs simply absorb oxygen and release carbon dioxide. The digestive system ingests food, not oxygen, and this process does not take place in the respiratory system. The respiratory system absorbs and transports oxygen, but does not produce it.

24.

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.

25.

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.

26.

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.

27.

In regard to the molecular and anatomical level or organization in the human body, which of the following atoms in living things, such as humans, is the least common?

Sulfur

Hydrogen

Carbon

Nitrogen

Correct answer: Sulfur

Atoms bond to form molecules, which comprise cells and all higher levels of human organs and tissues. The most commonly found atoms in living things (including humans) are hydrogen, carbon, nitrogen, and oxygen.

Sulfur is found in the human body but in very low amounts.

28.

Which of the following produce(s) estrogen and progesterone?

Ovaries

Uterus

Fallopian tubes

Vagina

Correct answer: Ovaries

The ovaries are glands located in the lower abdomen and are part of the female reproductive system. They produce the sex hormones estrogen and progesterone, which control and regulate such functions as menstruation and pregnancy.

The uterus is located inferior and medial to the ovaries and is responsible for housing a developing fetus during pregnancy.

The fallopian tubes travel from the ovaries to the uterus, carrying eggs to the uterus during ovulation.

The vagina is a muscular canal that travels from the uterus to the exterior of the body. While the uterus, fallopian tubes, and vagina are all involved in reproduction, none of them produce estrogen or progesterone.

29.

Which of the following are located in the lower extremity?

Tarsals and metatarsals

Carpals and metacarpals

Carpal 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.

30.

Which of the following **best** describes a bone sinus?

An air cavity within the bone

A rounded hole in the bone

A shallow depression in the bone

A ridge on the edge of a bone

Correct answer: An air cavity within a bone

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

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 crest is a ridge on the edge or side of a bone, such as the iliac crest.

31.

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).

32.

Which of the following glands is responsible for the secretion of breast milk?

Mammary glands

Vestibular glands

Cowper’s glands

Sudoriferous glands

Correct answer: Mammary glands

Mammary glands are found in the breast and are responsible for the secretion of breast milk.

Vestibular glands secrete mucus during a female’s sexual arousal. Cowper’s glands are responsible for the secretion of lubricant in a male’s urethra. Sudoriferous glands produce sweat.

33.

Which region of the body does the term "cephalic" refer to?

Head

Neck

Back

Chest

Correct answer: Head

Cephalic is a medical term used to describe the head. The head can also be described as including the cranial (upper skull) and facial (face) areas.

Cervical describes the neck, dorsal describes the back, and thoracic describes the chest.

34.

Which of the following muscles performs hip extension?

Gluteus maximus

Gluteus minimus

Piriformis

Sartorius

Correct answer: Gluteus maximus

The gluteus maximus muscle is the largest muscle of the buttocks. It is responsible for hip extension and lateral rotation of the thigh. It is especially active during walking and strenuous activities such as climbing and running.

Gluteus minimus performs thigh abduction and medial rotation, and allows for anterior tilt of the pelvis at the hip joint. Piriformis performs lateral rotation of the hip joint, and in certain positions it can also perform abduction and medial rotation. Sartorius performs flexion, lateral rotation, and abduction of the thigh, as well as flexion and medial rotation of the leg at the knee joint.

35.

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.

36.

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.

37.

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.

38.

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.

39.

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.

40.

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.

41.

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.

42.

A massage therapist is working with a client who has strained a muscle. The client has pain on the ischial tuberosity, where the muscle originates. She also has pain on the medial aspect of the thigh when she brings her leg closer to the midline.

Which of the following muscles is strained?

Adductor magnus

Biceps femoris

Sartorius

Vastus lateralis

Correct answer: Adductor magnus

In this example, the client's adductor magnus is strained. This muscle originates on the inferior ramus of the pubis, the ramus of the ischium, and the ischial tuberosity. It is a prime mover in thigh adduction (bringing the leg closer to the midline).

While a portion of the biceps femoris attaches to the iscial tuberosity, it is not a primary mover in adduction and is not located on the medial aspect of the thigh. The sartorius originates on the ASIS, and the vastus lateralis originates from various points on the femur including the greater trochanter and the intertrochanteric line.

43.

Which of the following bones is located in the lower limb of the skeleton?

Fibula

Sacrum

Ulna

Sternum

Correct answer: Fibula

The fibula is located in the lower limb of the skeleton. The other bones in the lower limb are the femur, tibia, patella, tarsals, metatarsals, and phalanges.

The sacrum and the sternum are located in the axial skeleton. The ulna is located in the upper limb.

44.

Which of the following is **true** of the great saphenous vein?

It ascends medially from the foot to the thigh, where it drains into the femoral vein.

It descends medially from the femoral artery to the foot.

It drains into the aorta.

It naturally becomes varicose with age.

Correct answer: It ascends medially from the foot to the thigh, where it drains into the femoral vein.

The great saphenous vein ascends medially from the foot to the thigh, where it drains into the femoral vein. It is one of the major veins of the lower extremity.

Veins do not connect directly with arteries; instead, they bring blood all the way back to the heart, where it is oxygenated before traveling back out through the arterial system. Therefore, it would not connect with either the femoral artery or the aorta, which is also arterial. While the great saphenous vein can develop into a varicose vein, this is not a symptom of pathology, not a natural process.

45.

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.

46.

Which of the following is **not** an anatomical structure of a woman's urinary system?

Uterus

Ureter

Kidney

Urethra

Correct answer: Uterus

The uterus is an organ of the female reproductive system, not the urinary system.

The urinary system consists of the kidneys, ureters, bladder, and urethra. The kidneys filter about 100 L of blood per day, reabsorbing 99 L of filtrate and leaving about 1 L of urine in the average adult.

47.

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.

48.

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.

49.

What valve connects the right atrium and right ventricle?

Tricuspid

Mitral

Semilunar

Aortic

Correct answer: Tricuspid

The tricuspid (also known as right atrioventricular) valve is located between the right atrium and the right ventricle.

The mitral valve (also known as left atrioventricular) valve is located between the left atrium and the left ventricle.

The semilunar valves control blood flow out of the ventricles into the aorta and pulmonary arteries.

The aortic valve is between the left ventricle and the aorta.

50.

Which of the following organs has the greatest effect on a client's blood sugar levels?

Pancreas

Kidney

Spleen

Brain

Correct answer: Pancreas

Faulty pancreatic activity affects insulin production. The body loses the ability to oxidize carbohydrates because of this. The insulin in the pancreas causes an individual's blood sugar level to drop and the glucagons in the pancreas cause an individual's blood sugar level to rise.

51.

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.

52.

Which of the following is an enzyme found in the stomach that is primarily responsible for digesting protein?

Protease pepsin

Amylase

Sucrase

Mucus

Correct answer: Protease pepsin

Protease pepsin is an enzyme found in the stomach. It is primarily responsible for digesting protein. HCl, also found in the stomach, has a similar function.

Amylase and lipase are found in the pancreas. Amylase digests polysaccharides, and lipase digests lipids.

Sucrase, which is found in the small intestine, digests sugars.

The mucosal lining of the stomach protects the stomach from acid. If this lining breaks down, the acid may burn the stomach, resulting in an ulcer. Mucus is not responsible for the chemical process of digestion.

53.

Of the following, what is the **best** description of edema?

An excess of interstitial fluid

An autoimmune condition

A symptom of dehydration

A warning sign for diabetes

Correct answer: An excess of interstitial fluid

Of the available options, edema is best described as an excess of interstitial fluid. Edema often results in tissue swelling, and is common wherever lymphatic blockage occurs.

Edema is often a symptom of other diagnoses or pathologies; it is not itself an autoimmune condition. Dehydration is caused by a lack of adequate water, not an excess of fluid. Excessive hydration, however, is not a cause of edema. Edema can indicate pathological conditions of the liver, heart, or kidneys. Diabetes is characterized by pathology of the pancreas.

54.

What 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.

55.

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.

56.

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.

57.

The extensor digitorum longus and the tibialis anterior move the ankle. What type of muscle are they?

Dorsiflexor

Plantar flexor

Invertor

Evertor

Correct answer: Dorsiflexor

The extensor digitorum longus and the anterior tibialis muscles are dorsiflexor muscles that move the ankle. Ankle dorsiflexion brings the toes toward the anterior aspect of the leg.

Plantar flexor muscles move the toes away from anterior aspect of the leg.

Invertor muscles turn the plantar side of the foot (sole) toward the midline of the body.

Evertor muscles turn the plantar side of the foot away from the midline.

58.

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: 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.

59.

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.*

60.

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.

61.

Which of the following **best** describes the endosteum?

The thin membrane of connective tissue that lines the marrow cavity of a bone

The thin membrane of connective tissue that covers the outside of a bone

The anatomical structure that connects muscle to bone

The anatomical structure that connects bone to bone

Correct answer: The thin membrane of connective tissue that lines the marrow cavity of a bone.

The endosteum is a thin vascular membrane of connective tissue that lines the marrow cavity of a bone. It contains cells that aid in bone growth and repair.

The periosteum is a thin membrane that covers the outside of the bones; this membrane is not found on the ends of bones that form joints. Tendons connect muscle to bone. Ligaments connect bone to bone.

62.

The nose, pharynx, and larynx are all parts of the:

Respiratory system

Nervous system

Lymphatic system

Muscular system

Correct answer: Respiratory system

The nose, pharynx, and larynx are all parts of the respiratory system.

The upper respiratory system includes:

1. ***The nasal cavity.***
2. ***The pharynx**, or throat, which is divided as follows:*

- ***The nasopharynx** is a pathway for air and a continuation of the nose and nasal cavity.*
- ***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.*
- ***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 lower respiratory tract includes the following:

1. ***The larynx** (voice box) connects the pharynx to the trachea (windpipe).*
2. ***The trachea** (windpipe) is the main airway to the lungs, extending from the glottis to the junction of the two main bronchi.*
3. ***The bronchi and alveoli** are within the lungs themselves. The bronchi are tubes that branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.*

The nervous system includes the brain, brainstem, spinal cord, and peripheral nerves. The lymphatic system transports lymph throughout the body. The muscular system includes the body's skeletal muscles.

63.

Which of the following blood vessels is a part of the respiratory system?

Pulmonary artery

Brachial artery

Carotid artery

Popliteal artery

Correct answer: Pulmonary artery

The pulmonary veins and arteries are involved in the exchange of oxygen and carbon dioxide between the capillaries and the alveoli. "Pulmonary" is a medical term that refers to the lungs.

The brachial arteries are located in the arms. The carotid artery is located in the neck. The popliteal arteries are located in the legs.

64.

A client comes to you who has recently been diagnosed with kidney stones. Her physicians would like her to try to pass them on her own. She is reporting significant flank (lower back) pain. This is **most** likely what kind of pain?

Visceral

Phantom

Musculoskeletal

Somatic

Correct answer: Visceral

Visceral pain is derived from viscera (or internal organs). In this case, the pain is likely coming from the client's kidneys, ureters, and/or urethra. This is a common symptom of kidney stones.

Phantom pain occurs in people who have undergone limb amputation when they experience sensations in a missing part of the body. Musculoskeletal pain comes from bone or muscle structures; given this client's diagnosis of kidney stones, it is unlikely for these structures to be the cause of her discomfort. Somatic pain arises from pain receptors in the skin or fascia and is similar to musculoskeletal pain.

65.

What is the **best** description of the way lymph moves through the lymphatic system?

In a peristalsis-like fashion, from higher pressure to lower pressure

In a peristalsis-like fashion, from lower pressure to higher pressure

In a pressure-sensitive fashion controlled by the heart's pumping action

From the thoracic duct out to the rest of the body

Correct answer: In a peristalsis-like fashion, from higher pressure to lower pressure

Lymph moves through the lymphatic system in a peristalsis-like fashion, from higher pressure to lower pressure. The flow of lymph is involuntary but is influenced and assisted by voluntary skeletal muscle movement.

While the movement of lymph is related to pressure, it is not affected by the pumping of the heart. Lymph moves from distal areas of the body toward the thoracic duct, where filtered lymph drains back into the rest of the circulatory system.

66.

All the following are part of the integumentary system, **except**:

The lymph nodes

The skin

The hair

The nails

Correct answer: The lymph nodes

The lymph nodes are part of the lymphatic system, not the integumentary system.

The integumentary system includes the skin and its associated structures, including the hair and nails.

67.

Which of the following describes the function of a ligament?

It connects a bone to another bone.

It connects a muscle to a bone.

It provides cushioning between joints.

It lines muscles.

Correct answer: It connects a bone to another bone.

A ligament is a short band of tough, flexible, fibrous connective tissue that connects two bones or cartilages together, and provides stability in a joint.

A tendon connects a muscle to a bone. Cartilage provides a cushioning between joints. Fascia is the lining of muscles.

68.

What are the four major nerve plexuses?

Cervical, Brachial, Lumbar, Sacral

Spinal, Sternal, Pelvic, Femoral

Sympathetic, Parasympathetic, Voluntary, Involuntary

Cervical, Sternal, Lumbar, Axial

Correct answer: Cervical, Brachial, Lumbar, Sacral

The four major nerve plexuses are the cervical, brachial, lumbar, and sacral plexuses. A plexus is an intertwining network of nerves that innervates a specific region of the body.

While the spinal, sternal, pelvic, femoral, and axial regions of the body are all innervated, none of these terms refer to major plexuses. The sympathetic nervous system is responsible for the body's fight/flight response and is activated due to stress. The parasympathetic nervous system is responsible for such functions as digestion and restoring homeostasis. Voluntary actions, like skeletal muscle movement, are performed consciously and intentionally. Involuntary actions, like digestion, are performed without conscious intention.

69.

A therapist is massaging a client. The client is lying prone (face down), and the therapist stands at their head. The therapist places their hands on the client's scapulae and uses a long, gentle stroke to move toward the client's iliac crests.

What **best** describes the direction of the therapist's movement?

Superior to inferior

Lateral to medial

Anterior to posterior

Ventral to dorsal

Correct answer: Superior to inferior

In this example, the therapist's hands are moving from a superior position to an inferior position. Any area closer to the head is superior, and any area closer to the feet is inferior. This is true regardless of the body's position in space; the head is still superior no matter their position. This remains true for clients who are standing, sitting, or lying down.

In a lateral to medial movement, the therapist would begin at the sides of the client's body and move toward the middle.

In an anterior to posterior movement, the therapist would begin in the front of the client's body and move toward the back.

Ventral is simply another word for anterior; dorsal is another word for posterior.

70.

What originates at the pubic symphysis and is used for spine flexion?

Rectus abdominis

Psoas major

External oblique

Internal oblique

Correct answer: Rectus abdominis

The rectus abdominis originates at the pubic symphysis and is used for spine flexion. It inserts at the cartilages of the fifth, sixth, and seventh ribs and the xiphoid process of the sternum. It also performs lateral flexion of the trunk, posterior tilt of the pelvis, and compression of the abdominal cavity (which supports the viscera).

The psoas major originates at the bodies and corresponding intervertebral disks of the last thoracic and all lumbar vertebrae, the anterior surface of the transverse processes of all lumbar vertebrae, and the tendinous arches extending across the sides of the bodies of the lumbar vertebrae. It inserts at the lesser trochanter of the femur. Concentrically, it performs thigh flexion and lateral rotation, trunk flexion, and lateral trunk flexion.

The external oblique muscle originates at the outer lip of the iliac crest, pubic bone, and linea alba. It inserts at the external surfaces of the lower eight ribs. It performs flexion, lateral flexion, and contralateral rotation of the trunk, among other movements.

The internal oblique muscle originates at the inguinal ligament, iliac fascia, anterior two-thirds of the middle lip of the iliac crest, and lumbar fascia. It inserts into the cartilage of the last three ribs and the aponeurosis that extends from the tenth costal cartilage to the pubic bone into the linea alba. It performs flexion, lateral flexion, and ipsilateral rotation of the trunk, among other movements.

71.

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.

72.

Embedded in the posterior of the thyroid are four tiny glands, which are known as:

Parathyroid glands

Hypothalamus

Thyroidial glands

Endocrine regulators

Correct answer: Parathyroid glands

The four tiny glands that are embedded in the posterior of the thyroid are known as parathyroids. They release a hormone called parathormone. This hormone combines with Vitamin D to regulate calcium levels throughout the body.

The hypothalamus is located below the thalamus in the center of the brain. While the thyroid and parathyroids are both part of the endocrine system, the term "endocrine regulators" is not commonly used. Thyrodial glands are not an anatomical structure.

73.

If a person experiences kidney dysfunction, what bodily process would **most** likely be difficult for them?

The regulation of bodily fluids

The transportation of urine to the bladder

Holding urine in the bladder

The elimination of urine

Correct answer: Regulating body fluids

Kidney dysfunction may impair a person's ability to regulate bodily fluids. The kidneys are responsible for the regulation of bodily fluids as well as the production of urine.

The ureter transports urine from the kidneys to the bladder. The bladder stores urine. The urethra eliminates urine from the body.

74.

What is the **best** definition of a bursa?

A sac filled with synovial fluid, usually intended to cushion a joint

A sleeve around a joint, formed by dense connective tissue

An upper chamber of the heart

A ligament that crosses the knee joint

Correct answer: A sac filled with synovial fluid, usually intended to cushion a joint.

A bursa is a sac filled with synovial fluid, usually intended to cushion a joint. Some bursae are found in other locations and cushion other structures that may rub against each other. Examples include the subcutaneous bursae, which are located between skin and bones, and the submuscular bursae, which are located between muscles and bones.

A joint capsule is a sleeve around a joint, formed by dense connective tissue. The upper chambers of the heart are the atria. The ACL and MCL are ligaments that cross the knee joint.

75.

Approximately what percentage of water is the human body is composed of?

55% to 70%

80% to 90%

30% to 40%

20% to 25%

Correct answer: 70%

The human body is composed of approximately 70% water. Water is essential for all living things, both human and non-human. In the human body, the water content of body tissues varies. Adipose tissue (fat) has the lowest water content and the skeleton has the second-lowest water content. The tissues that have the highest water content include the muscle, skin, and blood. Some research suggests that male body composition includes a higher percentage of water than that of a female body.

76.

What two structures does the larynx connect?

Pharynx and trachea

Pharynx and lungs

Pharynx and sinuses

Trachea and nose

Correct answer: Pharynx and trachea

The larynx (or voice box) connects the pharynx (or throat) to the trachea (or windpipe). It allows for the passage of air into and out of the body, and it produces sound.

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.

The lower respiratory tract includes:

1. ***The larynx** (voice box) connects the pharynx to the trachea (windpipe).*
2. ***The trachea** (windpipe) is the main airway to the lungs, extending from the glottis to the junction of the two main bronchii.*
3. ***The bronchi and alveoli** are within the lungs themselves. The bronchii are tubes that branch out from the trachea. They provide a pathway to the alveoli, which are the air sacs where external respiration takes place.*

77.

All of 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.

78.

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.

79.

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.

80.

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.

81.

What type of 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.

82.

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.

83.

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.

84.

During the process of digestion, a bolus of food travels through the stomach, small intestine, and large intestine. In which order does it progress through the areas of the large intestine?

Ascending > transverse > descending > sigmoid

Descending > transverse > ascending > sigmoid

Ascending > descending > transverse > sigmoid

Transverse > ascending > descending > sigmoid

Correct answer: Ascending > transverse > descending > sigmoid

The large intestine reabsorbs water from the bolus. It also forms and stores feces. After entering the large intestine, food travels through the ascending colon, the transverse colon, and the descending colon, followed by the sigmoid colon. It ultimately reaches the rectum, and any remaining matter is expelled through the anus as feces.

85.

The meninges consist of three layers of tissue. Which layer of tissue is the **thickest** external layer?

Dura mater

Arachnoid membrane

Pia mater

Cerebrum

Correct answer: Dura mater

The dura mater layer of tissue is the thickest external layer of the meninges.

The arachnoid membrane is the middle layer of the meninges. It is a web-like membrane containing many blood vessels. The pia mater is the innermost layer of the meninges. This is a thin layer of tissue that adheres directly to the brain and spinal cord. The cerebrum makes up 80% of the brain's total mass and is not part of the meninges.

86.

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.

87.

Which of the following 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.

88.

Which part of the brain is used for coordination, balance, and equilibrium?

Cerebellum

Cerebrum

Midbrain

Medulla oblongata

Correct answer: Cerebellum

The cerebellum is the part of the brain that is used for coordination, balance, and equilibrium.

The cerebrum is the part of the brain that is known as “the seat of intelligence." It has many functions, such as interpreting sensory information, transmitting motor impulses to initiate voluntary movement, and learning. The midbrain controls visual and auditory reflexes. The medulla oblongata controls involuntary functions such as the heartbeat, blood pressure, and respiration.

89.

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.

90.

Which of the following is **not** an easily palpated pulse point?

Splenic artery

Femoral artery

Dorsalis pedis artery

Radial artery

Correct answer: Splenic artery

The splenic artery supplies oxygenated blood to the spleen. It branches from the celiac artery. It is located within the trunk cavity; therefore, is not a pulse point for palpation.

The femoral artery is easily palpated over the anterior aspect of the inguinal/hip region. The dorsalis pedis artery is easily palpated on top of the foot. The radial artery can be easily palpated over the lateral aspect of the wrist.

91.

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.

92.

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.

93.

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.

94.

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.

95.

Which of the following options **best** describes the function of the heart's right atrium (RA)?

It receives the oxygen-poor blood from the vena cava.

It pumps oxygen-poor blood through the pulmonary arteries to the lungs.

It receives the oxygen-rich blood from the pulmonary veins.

It pumps the oxygen-rich blood into the aorta.

Correct answer: It receives the oxygen-poor blood from the vena cava.

The right atrium is responsible for receiving the oxygen-poor blood from the vena cava. It then pumps blood to the right ventricle through the tricuspid valve.

In more detail, the blood follows this path from the body, through the heart and lungs, and back out to the body:

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

The left ventricle pumps oxygen-rich blood into the aorta. The left atrium receives the oxygen-rich blood from the pulmonary veins. The right ventricle pumps oxygen-poor blood through the pulmonary arteries and into the lungs.

96.

A client's physician has diagnosed her with hypothyroidism. What system does this involve?

The endocrine system

The integumentary system

The lymphatic system

The cardiovascular system

Correct answer: The endocrine system

The thyroid is a part of the endocrine system. The endocrine system regulates the body's response to events in an effort to maintain homeostasis. It is primarily involved with physiological functions using chemicals called hormones. This system also includes the hypothalamus, hypophysis (or pituitary), thyroid, thymus (also in the lymphatic system), parathyroid, pineal, adrenal, pancreas, and the gonads (ovaries or testes).

The integumentary system involves the skin, hair, nail, sebaceous glands, sweat glands, and breasts. The lymphatic system involves lymph nodes, spleen, tonsils, and the thymus gland (also in the endocrine system). The cardiovascular system involves the heart, arteries, veins, and capillaries.

97.

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.

98.

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.