## MED 304. Nervous Physiology

(1) Which statement regarding CSF production and flow is correct? (a) CSF is produced along the spinal cord (b) CSF is produced by meningeal cells (c) CSF enter the meningeal layer through the cerebral aquaduct (d) CSF flows inferiorly along the dorsal subarachnoid space of the spinal cord (e) CSF does not flow through the meningeal layers.

(2) Which of the following is not accomplished by the cerebral cortex? (a) voluntary initiation of movement (b) control of breathing, circulation, and digestion (c) final sensory perception (d) language ability (e) personality traits.

(3) Language ability is usually associated with the (a) hypothalamus (b) right cerebral hemisphere (c) left cerebral hemisphere (d) limbic system (e) prefrontal association cortex.

(4) The sense of body position is (a) somatosensory (b) kinesthetic (c) proprioception (d) integrated in the occiptal lobe (e) None of the above

(5) The left cerebral hemisphere normally excels in all of the following except (a) musical ability (b) verbal tasks (c) math skills (d) logical and analytical tasks (e) language ability

(6) Parkinson's disease is (a) associated with a deficiency of serotonin (b) characterized by an intention tremor (c) characterized by a resting tremor (d) Both (a) and (b) above (e) Both (a) and (c) above.

(7) Which of the following functions is not associated with the hypothalamus? (a) control of respiration and circulatory function (b) control of thirst and urine output (c) control of body temperature (d) control of food intake (e) extensive involvement with emotion and behavioral patterns.

(8) Which part of the brain controls thirst and urine output, food intake, and body temperature, among other things? (a) cerebral cortex (b) hypothalamus (c) basal nuclei (d) thalamus (e) pons.

(9) A deficiency of the neurotransmitter dopamine in the basal nuclei causes (a) schizophrenia (b) epilepsy (c) Parkinson's disease (d) depression (e) aphasia.

(10) What region of the brain houses the centers that control the sleep-wake cycle? (a) hypothalamus (b) thalamus (c) brain stem (d) cerebral cortex (e) None of these answers.

(11) Which of the following statements concerning the spinal cord is incorrect? (a) afferent fibers enter the spinal cord through the ventral root (b) the dorsal and ventral roots at each level of the spinal cord join to form a spinal nerve (c) the spinal cord is not as long as the vertebral column (d) the ventral horn contains cell bodies of the efferent motor neurons that supply skeletal muscles (e) the white matter of the spinal cord is organized into ascending and descending tracts.

(12) What system would suppress the digestive organs during times of greater physical activity? (a) sympathetic (b) parasympathetic (c) enteric nervous system (d) somatic nervous system (e) None of these answers.

(13) Which of the following does not characterize the sympathetic nervous system? (a) It promotes responses that prepare the body for strenuous physical activity (b) It is part of the autonomic nervous system (c) It has norepinephrine as its postganglionic neurotransmitter (d) It is always excitatory (that is, it increases the activity in every tissue it innervates) (e) It is part of the efferent division of the peripheral nervous system.

(14) Receptors (a) may be either a specialized ending of an afferent neuron or a special cell closely associated with the peripheral ending of an afferent neuron. (b) are present for every modality in the environment (c) when stimulated bring about opening of $Na^+$ channels in the afferent neuron membrane adjacent to the receptor. (d) Two of these answers (e) All of these answers.

(15) Which of the following receptors are rapidly adapting? (a) muscle stretch receptors (b) tonic receptors (c) phasic receptors (d) Both muscle stretch receptors and tonic receptors are correct (e) All of these answers.

(16) Rods and cones (a) adapt as a result of the physical features of the receptor (b) detect light (c) are tonic receptors (d) do not display an "off-response." (e) measure the degree of joint flexion.

(17) The slow pain pathway is activated by (a) stimulation of mechanical or thermal nociceptors (b) stimulation of polymodal nociceptors (c) release of bradykinin (d) Both (a) and (c) above (e) Both (b) and (c) above .

(18) Endorphins and enkephalins (a) are endogenous morphinelike substances (b) are important in the body's natural analgesic system (c) stimulate the release of substance P by binding with opiate receptors (d) Both (a) and (b) above (e) All of these answers.

(19) The retina (a) is the middle layer of the eye (b) contains the photoreceptors (c) becomes specialized anteriorly to form the cornea (d) secretes the aqueous humor (e) None of these answers.

(20) Rhodopsin (a) is the photopigment found in the red cones. (b) consists of an opsin and retinene. (c) is most highly concentrated in the fovea. (d) is slowly broken down in the absence of light. (e) contains a derivative of vitamin B12.

(21) Which of the following activities occurs in the presence of light within the phototransduction pathway? (a) ganglion cells produce action potentials. (b) cGMP levels high in receptors. (c) bipolar cells produce graded potentials. (d) sodium channels open in receptors. (e) None of these answers.

(22) Which of the following statements concerning cones is incorrect? (a) cones are used for day vision. (b) cones are very sensitive to light. (c) cones exhibit high acuity. (d) cones are concentrated in the fovea. (e) cones provide color vision.

(23) During dark adaptation, (a) photopigments are gradually regenerated. (b) rhodopsin is rapidly broken down. (c) the cones for gray vision are stimulated more than the cones for color vision. (d) the sensitivity of the photoreceptors is reduced so that the image appears dim. (e) the bipolar cells are disinhibited.

(24) In light adaptation, (a) rhodopsin levels increase in rods. (b) rhodopsin levels decrease in rods. (c) cones become active. (d) Both (a) and (b) above. (e) Both (b) and (c) above.

(25) Which of the following does not occur in a photoreceptor during exposure to light? (a) membrane hyperpolarization. (b) closure of $Na^+$ channels in the outer segment. (c) increased transmitter release from the synaptic terminal. (d) decrease in cyclic GMP in the outer segment. (e) closure of $Ca^{2+}$ channels in the synaptic terminal.

(26) Which structure(s) is/are associated with hearing? (a) ampulla. (b) cochlea. (c) cupula. (d) cristae. (e) saccule.

(27) The tympanic membrane (a) vibrates when struck by sound waves. (b) contains the organ of Corti. (c) produces ear wax. (d) is connected to the stapes. (e) None of these answers.

(28) Transmission of sound through the middle ear results in (a) amplification of the pressure vibrations. (b) stimulation of middle ear receptor cells. (c) opening of the eustachian tube. (d) increased firing rate in sensory axons associated with the tympanic membrane. (e) None of these answers.

(29) Select the structure that is not found inside the cochlear duct. (a) basilar membrane. (b) endolymph. (c) oval window. (d) organ of Corti. (e) tectorial membrane.

(30) Deflection of the basilar membrane (a) activates the receptors of the organ of Corti. (b) occurs in response to fluid movements in the cochlea. (c) results from displacement of the round window. (d) both activates the sound receptors of the organ of Corti and occurs in response to fluid movements in the cochlea are correct. (e) All of these answers.

(31) Which type of sensory input is not integrated into the sense of equilibrium? (a) cutaneous. (b) proprioceptive. (c) vestibular. (d) visual. (e) visceral.

(32) The semicircular canals (a) detect the position of the head relative to gravity. (b) detect rotational or angular acceleration of the head. (c) contain otoliths. (d) Both (a) and (c) above. (e) Both (b) and (c) above.

(33) Taste (a) discrimination depends on the ratio of stimulation of the taste buds, which have a variation in relative sensitivity. (b) buds are stimulated only by chemicals in solution. (c) discrimination does not go beyond distinguishing between the four primary tastes-sweet, sour, salty, and bitter. (d) Both (a) and (b) above. (e) All of these answers.

(34) Binding of scent signals to olfactory receptors (a) activates G proteins. (b) Results in cAMP production. (c) Opens sodium channels. (d) Both (a) and (b) above. (e) All of these answers.

(35) Olfactory receptors (a) are specialized endings of afferent neurons, not separate cells. (b) when stimulated send impulses both to the limbic system for coordination between smell and behavior and to the thalamus and cortex for perception of smell. (c) are replaced about every two months. (d) Both (a) and (b) above . (e) All of these answers.

(36) The autonomic nervous system is (a) part of the somatic nervous system. (b) considered to be the involuntary branch of the efferent division of the peripheral nervous system. (c) part of the central nervous system. (d) Two of these answers. (e) All of these answers.

(37) Sympathetic stimulation _____ heart rate and _____ the motility in the digestive tract. (a) does not affect, decreases. (b) decreases, decreases. (c) decreases, increases. (d) increases, decreases. (e) increases, increases.

(38) Parasympathetic stimulation _____ heart rate and _____ the motility in the digestive tract . (a) does not affect, increases. (b) decreases, decreases. (c) decreases, increases. (d) increases, decreases. (e) increases, increases.

(39) Pacinian corpuscles (a) adapt as a result of the physical features of the receptor. (b) detect temperature. (c) are tonic receptors. (d) do not display an "off-response." (e) measure the degree of joint flexion.

(40) The autonomic nervous system is (a) part of the somatic nervous system. (b) considered to be the involuntary branch of the efferent division of the peripheral nervous system. (c) part of the central nervous system. (d) Two of these answers. (e) All of these answers.

(41) The overall functioning of the contributes to (a) conservation of energy resources when stress levels are low. (b) mobilization of energy reserves when stress levels are high. (c) suppression of nonvital activities when stress levels are high. (d) homeostasis. (e) All these answers.

(42) Which one of the following involves a response of a skeletal muscle through an efferent output? (a) augmented breathing from the diaphragm (b) delayed emptying of the stomach (c) increased pumping of blood (d) increased secretion of insulin (e) initiation of sweating

(43) Which is not characteristic of sympathetic pathways? (a) fibers issue from the thoracic and lumbar levels. (b) preganglionic fibers release norepinephrine. (c) postganlionic fibers release ACh. (d) short preganglionic fibers. (e) most preganglioic fibers synapse in the chain ganglia.

(44) Parasympathetic postganglionic fibers (a) arise from the ganglion chain located along either side of the spinal cord. (b) are cholinergic. (c) secrete norepinephrine. (d) Both (a) and (b) above. (e) Both (a) and (c) above.

(45) All of the following release acetylcholine except (a) sympathetic preganglionic fibers. (b) parasympathetic preganglionic fibers. (c) sympathetic postganglionic fibers. (d) parasympathetic postganglionic fibers. (e) motor neurons.

(46) Postganglionic autonomic fibers (a) end in a single terminal swelling, like a synaptic knob, that releases the neurotransmitter. (b) have numerous varicosities in their terminal branches that simultaneously release neurotransmitter over a large area of the innervated organ rather than on single cells. (c) innervate skeletal, smooth, and cardiac muscle. (d) Both (a) and (c) above. (e) Both (b) and (c) above.

(47) What system would suppress the digestive organs during times of greater physical activity? (a) sympathetic. (b) parasympathetic. (c) enteric nervous system. (d) somatic nervous system. (e) None of these answers.

(48) The sympathetic nervous system (a) is always excitatory. (b) innervates only tissues concerned with protecting the body against challenges from the outside environment. (c) dominates in fight-or-fight situations. (d) is part of the somatic nervous system. (e) is part of the afferent division of the peripheral nervous system.

(49) The sympathetic nervous system (a) is part of the somatic nervous system. (b) has cholinergic preganglionic and adrenergic postganglionic fibers. (c) originates in the thoracic and lumbar regions of the spinal cord. (d) Both (b) and (c) above. (e) All of these answers.

(50) Which of the following does not characterize the sympathetic nervous system? (a) It promotes responses that prepare the body for strenuous physical activity. (b) It is part of the autonomic nervous system. (c) It has norepinephrine as its postganglionic neurotransmitter. (d) It is always excitatory (that is, it increases the activity in every tissue it innervates). (e) It is part of the efferent division of the peripheral nervous system.