Physiology I dr jamil final 2017

Al-Azhar University-Gaza

College of Pharmacy
Department of
Pharmacology and medical sciences

Human Physiology I
Final Exam

Date: 28 / 12 /2017
Time: 120 minute

الرجاء قراءة السؤال جيداً قبل الإجابة

الاسم باللغة العربية: .....

Question	Marks	
Midterm	/40	/50
Part II and III of the CNS	/10	
Part 1	/20	/50
Part 2	/30	
Total	**/ 100**	

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Second semester C
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Part I: (Short notes) Please answer the following questions: (5 point each)

(A) Write down 5 functions of the following:

Brain stem	Cerebral cortex
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

(B) Compare between Slow-wave and Paradoxical sleep in term of:

Characteristic	Slow-wave sleep	Paradoxical slee
EEG		
Motor activity		
Heart rate, Respiratory rate and Blood pressure		
Dreaming / Arousal		
Percentage of sleeping time		

(C) Describe the Substance P pain pathway and analgesic pathway of the brain.

Characteristic	Fast Pain	Slow Pain
Occurs on stimulation of		
Carried by		
Pain produced		
Localization		
Order of occurrence		

(D) Describe phototransduction process performed by retinal cells. (with drawing)

(E) Draw the *Autonomic Nervous System* illustrating clearly the sites of neurotransmitters releasing and types of their receptor.

(F) Describe the Excitation–contraction coupling and muscle relaxation in skeletal muscle. (with drawing)

Part II: (MCQ) Please choose the correct answer: (30 points)

1. **Select the incorrect association.**
   (a) occipital lobe/speech formation.
   (b) occipital lobe/visual input.
   (c) parietal lobe/proprioception.
   (d) parietal lobe/somesthetic sensations.
   (e) temporal lobe/sound input.

2. **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.

3. **The region of the brain implicated in Parkinson's disease is the:**
   (a) cerebral cortex.
   (b) basal nuclei.
   (c) cerebellum.
   (d) basal ganglia.
   (e) None of these choices.

4. **Slow-wave sleep:**
   (a) involves minor increases in heart rate and respiration.
   (b) displays slow EEG waves and minor reductions in blood pressure.
   (c) accounts for about 20% of time spent sleeping.
   (d) occurs in four stages with common dreams.
   (e) None of these choices.

5. **Which component is absent in a typical reflex arc?**
   (a) Efferent pathway
   (b) Sensory receptor
   (c) Afferent pathway
   (d) Effector
   (e) Motor receptor

6. **Wernicke's area functions mainly for**
   (a) language expression.
   (b) hand-eye coordination.
   (c) language comprehension.
   (d) memory.
   (e) control of limb movements.

7. **Which of the following statements is correct regarding receptor adaptation?**
   (a) Tonic receptors adapt very slowly or do not adapt to stimuli.
   (b) Receptors cannot adapt to stimuli.
   (c) Adaptation increases the frequency of action potentials generated by afferent neurons.
   (d) Phasic receptors adapt slowly, and they have a rapid off response.
   (e) None of these choices.

8. **Slow-wave sleep:**
   (a) dreaming is common in these stages.
   (b) displays slow EEG waves and minor reductions in blood pressure.
   (c) accounts for about 20% of time spent sleeping.
   (e) occurs in four stages with common dreams.
   (d) None of these choices.

9. **The smaller the receptive fields in a region, the**
   (a) greater the density of receptors in the region.
   (b) greater the acuity in the region.
   (c) more cortical space allotted for sensory reception from the region.
   (d) Both (a) and (b) above .
   (e) All of these answers.

10. **Tonic receptors**
   (a) adapt rapidly.
   (b) frequently exhibit an "off-response."
   (c) can measure the degree of joint flexion.
   (d) All of these answers.
   (e) None of these answers.

11. **Which of the following statements concerning myopia is correct?**
   (a) the curvature of the lens is uneven.
   (b) a near source of light is focused on the retina without accommodation.
   (c) a convex lens is used to correct the condition.
   (d) the images from the two eyes are not fused within the cortex.
   (e) there is increased intraocular pressure.

12. **Cones have higher acuity than rods because**
   (a) cones respond more to dim light.
   (b) there are three types of cones.
   (c) there is little convergence in the cone pathways within the retina.
   (d) there are more cones than rods.
   (e) the photopigment in the cones breaks down more rapidly than in rods.

13. **The ossicular system of the ear**
   (a) keep the pressure on the two sides of the tympanic membrane equal.
   (b) increases the intensity of vibration.
   (c) assists in determining whether a sound comes from the front or rear.
   (d) is part of the vestibular apparatus.
   (e) is in direct contact with the tympanic membrane and the round window.

14. **Sound is characterized by:**
   (a) timbre which is additional frequencies superimposed on the sound waves.
   (b) intensity, which depends on the frequency of vibration of sound waves.
   (c) pitch or tone, which is determined by amplitude of sound waves.
   (d) All of these choices.

15. **End-plate potential at the neuromuscular junction:**
   (a) is an action potential.
   (b) is the same magnitude as an EPSP.
   (c) is caused by influx of sodium through nicotinic cholinergic receptors.
   (d) is a graded potential.
   (e) More than one of these choices.

16. **The efferent division of the peripheral nervous system:**
(a) composed of the involuntary autonomic branch and the voluntary somatic branch.
(b) composed of the involuntary autonomic branch and the involuntary somatic branch
(c) composed of the voluntary autonomic branch and the involuntary somatic branch.
(d) composed of the involuntary sensory branch and the voluntary somatic branch.

17. **Parasympathetic stimulation produces which response?**
(a) Decreased heart rate.
(b) Increased GI motility.
(c) Contraction of the bladder.
(d) More than one of these choices.
(e) All of these choices.

18. **Which of the following is not an exception to the rule of dual autonomic innervation?**
(a) Salivary glands
(b) Sweat glands
(c) Blood vessels of the genitalia
(d) All blood vessels
(e) None of these choices

19. **Muscarinic cholinergic receptors will bind to:**
(a) nicotine, muscarine, and acetylcholine.
(b) dopamine, nicotine, and acetylcholine.
(c) norepinephrine, muscarine, and acetylcholine.
(d) muscarine and acetylcholine.
(e) nicotine and acetylcholine.

20. **Atropine, a muscarinic antagonist, will have what effect on skeletal muscle?**
(a) Inhibition
(b) Both excitation and inhibition
(c) Excitation
(d) No effect

21. **Which region of the central nervous system is involved in autonomic control?**
(a) Thalamus
(b) Prefrontal sensory cortex
(c) Medulla
(e) Dorsal root ganglion
(d) All of these choices

22. **Somatic motor pathways:**
(a) are voluntary pathways, even some movement is subconsciously controlled.
(b) typically originate in the ventral horn of the gray matter.
(c) are influenced by the brain stem, basal nuclei, and cerebellum.
(d) are one-neuron pathways, not needing a synapse in the periphery.
(e) All of these choices.

23. Voltage-gated calcium channels on the terminal button of motor neuro
(a) causes reuptake of calcium from the cleft.
(b) causes the exocytosis of acetylcholine from a portion of the storage ves
(c) inhibits acetylcholinesterase in the cleft.
(d) propagates the action potential through the axon terminal.
(e) depolarizes the axon.

24. Z lines
(a) are formed by the T tubules.
(b) extend down the middle of the I band.
(c) are formed by the cross bridges.
(d) are the thin filaments.
(e) extend down the middle of the sarcomere.

25. During muscle contraction, the
(a) contractile proteins contract.
(b) A band becomes shorter.
(c) H zone becomes smaller or disappears.
(d) I band remains unchanged.
(e) More than one of these answers.

26. Which of the following statements is not correct? Cross bridges
(a) cross bridges bind to actin during muscle contraction.
(b) cross bridges are formed by the globular heads of the myosin molecules
(c) cross bridges consist of troponin + tropomyosin protruding from the actin
(d) cross bridges bend during muscle contraction.
(e) cross bridges protrude from the thick filaments.

27. The functional unit of skeletal muscle is the
(a) smallest contractile component of a muscle fiber.
(b) area between two Z lines.
(c) sarcomere.
(d) Two of these answers.
(e) All of these answers.

28. The purpose of the T tubules is:
(a) increasing the speed of ATP hydrolysis.
(b) closing ryanodine receptors.
(c) buffering changes in muscle pH during exercise.
(d) inhibiting the sarcoplasmic reticulum.
(e) rapid transmission of the action potential throughout the muscle fiber.

29. At the end of electrical excitation in a skeletal muscle:
(a) the T tubules are broken down and replaced.
(b) Ca^{2+} is actively pumped back into sarcoplasmic reticulum by an active pump.
(c) myosin heads return to their resting position uncharged.
(d) calcium is enzymatically degraded in the cytosol.
(e) None of these choices.

30. What would happen if ATP supplies became very low in a muscle cell?
(a) tension development would decrease.
(b) cross bridges would not detach from actin.
(c) possibly contractures.
(d) in death, rigor complex.
(e) All these answers.