Practice Exam #2 PCB-3703 Spring 2019
Chapters 7, 8, 9 & 10 SARC – Beau M.

NOTE: This exam covers some, but not all the material from chapters 7-10, and is intended to be a source for study. Please be sure to check the website (ucfsarc.wordpress.com/pcb-3703/) for more study materials or come to any of my sessions for additional help. Good luck studying!

1. Efferent postganglionic fibers of the Sympathetic Nervous System in the abdomen have their neuron cell bodies at their synapse at the _____, then synapse at _____.
a.) Sympathetic Chain Ganglia; Abdominal Ganglia on target organ tissue
b.) Abdominal Ganglia; Celiac Ganglion
c.) Sympathetic Chain Ganglia; Superior & Inferior Mesenteric Ganglia
d.) Abdominal Ganglia; target organ tissue

2. What kind of efferent fibers and receptors of the Sympathetic Nervous System are responsible for stimulating and receiving the signal for secretion of epinephrine and norepinephrine from Chromaffin cells?
a.) Postganglionic fibers; α2 Adrenergic receptors
b.) Preganglionic fibers; Nicotinic receptors
c.) Postganglionic fibers; Cholinergic receptors
d.) Preganglionic fibers; α2 Adrenergic receptors
e.) Postganglionic fibers; Muscarinic receptors

3. Which of the following receptors can be found in the neuromuscular junction? **[select all that apply]**
a.) α2
b.) Nicotinic
c.) β1
d.) α1
e.) Muscarinic
f.) β2
g.) all the above
h.) none of the above

4. What portion of the Central Nervous System would be responsible for signaling the Sympathetic α1 and β2 receptors to inhibit urination?
a.) Medulla
b.) Apneustic Center
c.) Midbrain
d.) Pons
e.) Hypothalamus

5. A patient arrives in the ER exhibiting a slow heart rate, sweating, fatigue, diarrhea, polyuria, excessive salivation, and a wet cough. Symptoms seem to be worsening over time. After speaking with the patient's family, they reveal they had been camping in the national forest nearby and the patient had recently ingested some mushrooms scavenged from the forest. Luckily, the patient's family brought the mushrooms in a plastic bag and after some investigation it is revealed that this particular species contains toxic amounts of muscarine. What treatment option is most appropriate for the patient?
a.) Propranolol
b.) Albuterol
c.) Atropine
d.) Neostigmine
e) none of the above, there is no hope for this patient

6. Which of the following cranial nerves are involved in Parasympathetic Nervous System innervation?
[select all that apply]
a.) Trigeminal Nerve
b.) Oculomotor Nerve
c.) Abducens Nerve
d.) Facial Nerve
e.) Vagus Nerve
f.) Pelvic Splanchnic Nerve
g.) Glossopharyngeal Nerve
h.) none of the above

7. Which of the following cranial nerves is the principle nerve for Parasympathetic Nervous System innervation of the gastrointestinal tract?
a.) Trigeminal Nerve
b.) Oculomotor Nerve
c.) Abducens Nerve
d.) Facial Nerve
e.) Vagus Nerve
f.) Pelvic Splanchnic Nerve
g.) Glossopharyngeal Nerve
h.) none of the above, there is no principle nerve for GI stimulation

8. Gustatory receptors of efferent sensory nerve fibers belong to the Peripheral Nervous System
a.) True
b.) False
c.) not enough information is available to come to a conclusion

9. At which order of sensory neuron does an incoming signal taking the Anterolateral pathway become contralateral?
a.) 2nd order in the medulla
b.) 3rd order in the Thalamus
c.) 2nd order in the Thalamus
d.) 3rd order in the spinal cord nucleus Gracilis
e.) 2nd order in the spinal cord
f.) both A and C
g.) both A and E
h.) both C and E
i.) none of the above

10. Mechanoreceptors that send signals along the Anterolateral Somatosensory pathway are **[select all that apply]**:
a.) phasic
b.) pacinian corpuscles
c.) A-α
d.) tonic
e.) A-γ
f.) none of the above

11. Which nerve has its second order synapse at the Geniculate ganglion in the Gustatory System?
a.) CN VII b.) CN V3 c.) Chorda tympani d.) CN IX e.) none of the above
f.) B & C g.) A & C

12. Chemoreceptor cells in the olfactory system are specialized epithelial cells that transduce signals to Mitral cells.
a.) True
b.) False (not epithelia, are true neurons)

13. Ciliary bodies of the Iris secrete an aqueous humor in the eye, which eventually drains through the _____, a foramen that connects to the venous system of the _____ layer.
a.) Lacrimal duct; Sclera
b.) Canal of Schlemm; Retinal
c.) Intraocular foramen; Sclera
d.) Canal of Schlemm; Choroid
e.) none of the above

14. Which of the following portions of the Retina are devoid of light-sensing photoreceptors? **[select all that apply]**
a.) Optic disk
b.) Bipolar cells
c.) Fovea Centralis
d.) Amacrine cells
e.) both A & C only
f.) all of the above

15. What is the cause and effect of hyperpolarization in Horizontal cells due to a decrease in cyclic guanosine monophosphate concentration in Rod cells?
a.) excitatory neurotransmitter stimulation; sight
b.) inhibitory neurotransmitter stimulation; sight
c.) excitatory neurotransmitter stimulation; no sight
d.) inhibitory neurotransmitter stimulation; no sight
e.) not enough information is given to reach a conclusion

16. A patient presents with acute vision loss in the right eye following a crash that left them with multiple facial bone fractures, but an uninjured eyeball. What is the most likely cause of damage, and where is it located?
a.) severing of the right branch of CN II
b.) damage to left lateral geniculate nucleus
c.) damage to left & right geniculo-calcarine tract
d.) nasal field damage to optic tract
e.) none of the above

17. The cell bodies of first order CN VIII neurons are located where?
a.) basilar membrane
b.) scala media
c.) spiral ganglion
d.) scala tympani
e.) cochlear nerve
f.) Dorsal & Ventral nuclei

18. Angular acceleration stimulus in the semicircular canals is received by _____, and redirects motor innervation to extraocular muscles via neurons in the _____:
a.) Medial & Superior Vestibular nuclei; Medial Longitudinal fasciculus
b.) CN VIII; Lateral Vestibular nucleus
c.) Inferior Vestibular nucleus; Spinal cord oculomotor neurons
d.) Medial & Superior Vestibular nuclei; Cerebellum

19. The Reticulo-spinal tract pathway of the Vestibular system **[select all that apply]**:
a.) stimulates β motor neurons in the skeletal muscle for stretching
b.) stimulates α sensory neurons in the skeletal muscle for contractions after stretching
c.) has γ sensory neurons in the skeletal muscle in contact with motor nerves via inter-neurons to stimulate contractions after stretching
d.) stimulates α motor neurons in the skeletal muscle for contractions after stretching
e.) A & B only
f.) none of the above

20. Damage to the lateral vestibular nucleus in the Medulla inhibits synapse between the utricle's afferent neuron and the spinal cord's efferent motor neuron; what is the physiological result? **[select all that apply]:**
a.) lack of extraocular muscle reflex upon angular acceleration
b.) lack of postural reflex in extensor muscles of the upper & lower limbs
c.) lack of interneuron stimulation which inhibits muscular contractile reflex after stretching
d.) lack of postural reflex inhibition in flexor muscles of the upper & lower limbs
e.) none of the above

21. Which of the following phagocytic neuroglial cells belong to the CNS?
a.) Satellite cells
b.) Microglia
c.) Oligodendrocytes
d.) Astrocytes
e.) both B & C
f.) B, C, & A
g.) both B & D

22.) Which of the following hormones stimulates the pituitary secretion of Adrenocorticotropic Hormone (ACTH) into circulation, and what is the target tissue receiving ACTH?
a.) CRH; Adrenal Medulla
b.) Leptin; Adrenal Cortex
c.) Cortisol; Adrenal Medulla
d.) CRH; Adrenal Cortex
e.) Leptin; Adrenal Medulla
f.) both B & D
g.) both A & C

23-30, Match the following terms with their most appropriate description:

23. Nitric Oxide ___	24. Microglia ___
25. Schwann cells ___	26. Ependymal cells ___
27. Neurons ___	28. Satellite cells ___
29. Oligodendrocytes ___	30. L-Dopa ___

a.) active during immunological responses in the CNS
b.) found in dorsal root ganglion, dorsal horn of the spinal cord gray matter, and in sympathetic chain ganglia
c.) vasodilates the dorsal vein of the penis for an erectile response
d.) able to cross the blood-brain-barrier
e.) facilitate the circulation of CSF in the ventricles of the brain
f.) form myelin sheaths around central axons
g.) unable to replicate or divide once developed
h.) form myelin sheaths around peripheral axons

31. Which of the following are functions of skeletal muscle tissue? **[select all that apply]:**
a.) stabilization of joints
b.) generation of body heat
c.) movement of the bones
d.) Peristalsis
e.) none of the above

32. Which of the following is INCORRECT regarding intrafusal fibers?
a.) they are afferent fibers that relay sensory stimulus to the dorsal horn motor neuron cell bodies
b.) they relay vibration stimulus via Pacinian corpuscle group II fibers
c) they run parallel to extrafusal fibers of the skeletal muscle
d.) they relay deep stretch stimulus via Muscle Spindle group Ia & II fibers
e.) all of the above are correct statements

33. Skeletal muscle contraction is mainly stimulated by _____, while smooth muscle contraction is mainly stimulated by _____:
a.) Epinephrine; Calcium
b.) Norepinephrine; Acetylcholine
c.) Troponin-C; Norepinephrine
d.) Acetylcholine; Norepinephrine

34: Which of the following is the main post-synaptic cell surface receptor that receives the neurotransmitter stimulus to contract skeletal muscle in the neuro-muscular junction?
a.) Adrenergic
b.) Cholinergic
c.) Nicotinic
d.) Muscarinic
e) both A & B
f.) both B & C

35. The calcium needed by muscle cells to undergo a muscular contraction is supplied by calcium ion channels.
a.) True
b.) False

36. In which of the following portions of a resting sarcomere can we expect to find thick filaments?
[select all that apply]:
a.) H band
b.) A band
c.) Z-line
d.) I band
e.) M-line
f.) all of the above

37. What occurs if calcium is absent in a muscle cell following a contraction stimulus?
a.) Troponin-C activates conformational changes in Tropomyosin that allow Myosin to bind to Actin
b.) Troponin-T activates conformational changes in Tropomyosin that inhibit Myosin from binding to Actin
c.) Tropomyosin blocks the Myosin binding site on the Actin filament
d.) none of the above

38. A single motor unit is composed of a single motor neuron in the dorsal gray matter of the spinal cord and all the muscle fibers it innervates.
a.) True
b.) False

39. Which of the following statements regarding Duchenne Muscular Dystrophy is INCORRECT?
a.) It is a recessive genetic disorder
b.) The mutated gene responsible is X-linked
c.) the disorder typically manifests in children 2-10 years of age
d.) the disorder is a myopathy characterized by dystrophin deficiency
e.) all of the above statements are correct

40. Which of the following are features of skeletal muscle cells? **[select all that apply]:**
a.) a single cell is multinucleated
b.) cells contain gap junctions to easily transport Ca^{2+} between neighboring cells during a contraction stimulus
c.) cells are spindle-shaped
d.) cell nuclei are centrally located
e.) cells are striated differently depending on the stage of contraction or relaxation
f.) are extrafusal fibers

ANSWER KEY ON NEXT PAGE

ANSWER KEY:

1D	11G	21G	31ABC
2B	12B	22D	32A
3G	13D	23C	33D
4C	14ABD	24A	34C
5C	15C	25H	35B
6BDEG	16A	26E	36ABE
7E	17C	27G	37C
8B	18A	28B	38B
9H	19CD	29F	39C
10AB	20BD	30D	40AEF