HUMAN ANATOMY - BIOL 11 EXAM 3 - November 11, 2011 NAME:

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Part I. [65 pts]: Choose the one BEST answer. Circle its letter, write it in the blank, or fill in the blank, as indicated. Read each question and **all the choices** carefully because more than one answer might seem correct at first glance. For the non-standard questions, **read instructions carefully!** *1 pt each*

1. The diaphragm is innervated by
   a. the cervical plexus
   b. the phrenic nerve
   c. lower thoracic spinal nerves in its vicinity
   d. a and b
   e. all of the above

2. Parts of the eye that bend light rays include
   a. cornea
   b. lens
   c. pupil
   d. a and b
   e. all of the above

3. Select the row that best describes the name and location of the superior and inferior spinal cord enlargements

	name superior	~ location superior	name inferior	~ location inferior
a.	cervical enlargement	C4 - T1	lumbar enlargement	T9 - T12
b.	thoracic enlargement	T2 -T9	lumbar enlargement	L1 - L5
c.	cervical enlargement	C1 - C4	thoracic enlargement	T2 - T9
d.	thoracic enlargement	T9 - T12	sacral enlargement	L4 - S4
e.	thoracic enlargement	T2 -T9	sacral enlargement	L4 - S4

4. General senses are characterized as
   a. requiring structurally complex receptor organs
   b. located only in the head
   c. requiring structurally simple receptors
   d. distributed throughout the body
   e. a and b
   f. c and d
   g. no such generalization is correct

5. Air-filled spaces in the ear include
   a. Eustachian tube
   b. middle ear
   c. vestibule
   d. a and b
   e. all of the above

6. The posterior root ganglion contains
   a. cell bodies of motor neurons
   b. cell bodies of sensory neurons
   c. satellite cells
   d. a and c
   e. b and c
   f. all of the above

7. Sensory pathways in the spinal cord tend to travel
   a. they are afferent so they usually travel from inferior toward superior
   b. they are afferent so they usually travel from superior toward inferior
   c. they don't "tend to", they always travel from inferior toward superior
   d. they don't "tend to", they always travel from superior toward inferior
   e. they don't "tend to", and they don't "travel" or move; information travels from inferior toward superior
   f. they don't "tend to", and they don't "travel" or move; information travels from superior toward inferior

8. Areas of the brain that typically continue to function during coma include
   a. mesencephalon
   b. pons
   c. medulla oblongata
   d. diencephalon
   e. a and b
   f. a, b, and c
   g. all of the above

9. A peripheral branch (directly) of a spinal nerve is named
    a. root
    b. rootlet
    c. ramus
    d. communicantes
    e. nerve

10. The part of the brain, known as a bridge, that connects parts of the brain with one another is the
    a. pons
    b. medulla oblongata
    c. spinal cord
    d. pyramids
    e. olive

11. The infundibulum connects
    a. pituitary gland and hypothalamus
    b. pituitary gland and thalamus
    c. pons and hypothalamus
    d. thalamus and pars distalis
    e. pars distalis and pars intermedia

12. The femoral nerve and sciatic nerve are derived from the
    a. lumbar plexus
    b. sacral plxus
    c. lumbosacral plexus
    d. a and b
    e. all of the above

13. Tracts that connect the right and left sides of the CNS are
    a. association
    b. longitudinal
    c. commissural
    d. projection
    e. arcuate

14. Funiculi all contain
    a. gray matter and synapses
    b. sensory fibers
    c. myelinated tracts
    d. motor fibers
    e. myofibers

15. White matter of the cerebellum is called the
    a. folia
    b. fornix
    c. corpus callosum
    d. arbor vitae
    e. pyramids

16. The vagus nerve sends branches to all of the following plexi except the
    a. aortic plexus
    b. brachial plexus
    c. esophageal plexus
    d. respiratory plexus
    e. thoracic plexus

17. The pattern of gray matter and white matter in the brain and spinal cord is (in general terms)
    a. gray matter is superficial around white matter that is deep (nearer the lumen)
    b. white matter is superficial around gray matter that is deep (nearer the lumen)
    c. a is true for brain and b is true for spinal cord
    d. b is true for brain and a is true for spinal cord
    e. b is true throughout the CNS, but in cerebrum and cerebellum there is an additional layer of gray matter superficial to the white matter

18. Special senses are characterized as
    a. requiring structurally complex receptor organs
    b. located only in the head
    c. requiring structurally simple receptors
    d. distributed throughout the body
    e. a and b
    f. c and d
    g. no such generalization is correct

19. The tapering inferior end of the spinal cord is the
    a. filum terminale
    b. cauda equina
    c. conus terminale
    d. filum medullaris
    e. conus medullaris

20. A specific segment of skin supplied by a single nerve is a
    a. plexus
    b. ramus
    c. dermatome
    d. sensory unit
    e. somite

21. The V-shaped row at the back of the tongue is composed of
    a. taste buds
    b. circumvallate papillae
    c. fungiform papillae
    d. a and b
    e. all of the above

22. The region of the brainstem associated with the most cranial nerves is
    a. mesencephalon
    b. pons
    c. medulla oblongata
    d. cerebellum
    e. myelencephalon

23. Elevated glucose blood levels stimulate the release of
    a. insulin
    b. glucagon
    c. thyroxin
    d. growth hormone
    e. epinephrine

24. Receptors that send their information to the brain in the vestibular division of CN VIII are found in the
    a. semicircular canals
    b. utricle
    c. cochlea
    d. a and b
    e. all of the above

25. You should wait to swim after eating because
    a. the lifeguard ***and*** your mother! say to wait
    b. you could weigh yourself down
    c. blood needs to go to the organs for digestion, and there isn't enough for swimming emergencies also
    d. your body can't digest and swim at the same time
    e. everyone else waits

26. Olfactory receptor cells are
    a. sensory neurons
    b. multipolar neurons
    c. association neurons
    d. bipolar neurons
    e. unipolar neurons

27. The different cranial nerves that carry taste information to the brain differ in that
    a. they each carry information about different tastes
    b. they do not differ - they are redundant as a failsafe, so that we are unlikely to lose that function entirely
    c. they supply different locations
    d. they bring information to different parts of the brain, so one is for conscious taste, the others are for reflexes and memory
    e. only one cranial nerve really carries information about taste; other nerves to the mouth are for somatic sensations and motor control

28. Axons carrying information from sympathetic trunk ganglia to spinal nerves are found in
    a. white rami communicantes
    b. gray rami communicantes
    c. splanchnic nerves
    d. pterygopalatine ganglia
    e. otic ganglia
    f. all of the above

29. In the autonomic nervous system, the postganglionic element
    a. originates as a neuron in a ganglion
    b. as soon as an axon passes through a ganglion, it is considered postganglionic
    c. starts after the ganglion
    d. is found only in the target organ
    e. is an axon, only

30. When the receptor and effector organs of a reflex are on the same side it is termed?
    a. contralateral
    b. ipsilateral
    c. monosynaptic
    d. polysnaptic
    e. intersegmental

31. The endocrine system differs from the nervous system in that the endocrine system
    a. secretes hormones into the blood whereas the nervous system releases neurotransmitter to generate nerve impulses
    b. is long-lasting whereas the nervous system is short-term
    c. has a rapid reaction time whereas the nervous system has a slow reaction time
    d. a and b
    e. all of the above

32. Neurons of the right and left spinal cord horns communicate via
    a. subdural space
    b. denticulate ligaments
    c. gray commissure
    d. central canal
    e. none of the above: gray matter does not need to “communicate”

33. “Pink eye” refers to inflammation of the
    a. iris
    b. conjunctiva
    c. sebaceous gland
    d. lacrimal caruncle
    e. eyelid

34. Spinal cord gray matter includes
    a. sensory nuclei
    b. somatic nuclei
    c. visceral sensory nuclei
    d. motor nuclei
    e. all of the above

35. The cerebellum receives input from
    a. somatic sensory pathways
    b. visual pathways
    c. vestibular pathways
    d. motor cortex of the precentral gyrus
    e. a, b, and c
    f. all of the above

36. Layer(s) of the eyeball that are complete include
    a. fibrous tunic
    b. vascular tunic
    c. neural tunic
    d. a and b
    e. all of the above

37. The posterior ramus innervates
    a. posterior skin
    b. deep muscles of the back
    c. lateral portions of the trunk
    d. the limbs
    e. a and b
    f. all of the above

38. Releasing hormones, that stimulate other organs to release their specific products, are produced by the
    a. hypothalamus
    b. pituitary
    c. thyroid
    d. adrenal cortex
    e. liver

39. The cerebellar lobe that can only been seen by reflecting another lobe is the
    a. frontal lobe
    b. insula
    c. parietal lobe
    d. temporal lobe
    e. occipital lobe

40. Melatonin, involved in circadian rhythms, is produced in the
    a. pituitary gland
    b. pons
    c. pineal body
    d. infundibulum
    e. hypothalamus

41. In order to function correctly, that is, produce its hormone(s), iodine is required by the
    a. thyroid gland
    b. parathyroid gland
    c. pineal gland
    d. a and b
    e. all of the above

42. Sensing changes in tension and stretch of skeletal muscle, tendons and ligaments is
    a. pressure sensation
    b. perception
    c. proprioception
    d. chemical sensation
    e. temperature sensation

43. A cranial nerve contains
    a. all - only - afferent fibers; sensory
    b. all - only - efferent fibers; motor
    c. a mix of afferent and efferent fibers
    d. all cranial nerves are either a or b
    e. some cranial nerves are a, some are b, some are c

44. This eye layer contains melanin to absorb stray light rays which prevents reflection and scattering of light
    a. pigmented epithelium
    b. choroid
    c. pupil
    d. a and b
    e. all of the above

45. Tears
    a. reduce friction
    b. cleanse and moisten the eye surface
    c. prevent (or lessen the likelihood of) bacterial infection
    d. a and b
    e. all of the above

46. The structure that separates the lateral ventricles from each other is the
    a. septum pellucidum
    b. corpus callosum
    c. foramina of Monro
    d. fornix
    e. there is no need for a strucutre since they are not next to each other

47. The cauda equina is
    a. a group of nerves that are not yet spinal nerves because they have not yet exited the spine
    b. a group of spinal nerves
    c. a cluster of axons inferior to the spinal cord
    d. a group of nerves that interact with each other to share responsibilities for a certain peripheral region
    e. the end of the spinal cord

48. The pancreatic cells that secrete insulin are
    a. F-cells
    b. alpha cells
    c. beta cells
    d. delta cells
    e. principal cells

49. Name three (3) sensory receptors:

50. The diaphragm is innervated from
    a. the cervical plexus
    b. lower thoracic spinal nerves in its vicinity
    c. mid-thoracic spinal nerves in its vicinity
    d. the sympathetic system
    e. the parasympathetic system

51. All of the following are functions of the reticular system EXCEPT
    a. processing visual stimuli
    b. arousal from sleep
    c. processing touch stimuli
    d. processing motor functions
    e. processing auditory stimuli

52. Prevertebral ganglia differ from sympathetic trunk ganglia in that the prevertebral ganglia are
    a. single structures, rather than paired
    b. anterior to the vertebral column
    c. located only in the abdominopelvic cavity
    d. a and b
    e. all of the above

53. A nerve plexus is an interweaving of nerves from
    a. spinal nerve anterior rami from specific segments of the spinal cord
    b. nerves emanating from the sympathetic ganglion chain
    c. sacral preganglionic parasympathetic nerves
    d. a and b
    e. all of the above

54. Tears production is accomplished by the
    a. lacrimal glands
    b. glands of the lacrimal caruncle
    c. lacrimal apparatus
    d. a and b
    e. all of the above

55. Blood levels of calcium and phosphate are lowered by inhibiting osteoclast activity by
    a. thyroid hormone
    b. calcitonin
    c. parathyroid hormone
    d. epinephrine
    e. insulin

56. An opening that allows a lateral ventricle to communicate with the third ventricle is the
    a. septum pellucidum
    b. interventricular foramen
    c. cerebral aqueduct
    d. central canal
    e. median aperture

57. Decussation of tracts in the CNS
    a. means crossing
    b. results in each side of the brain controlling contralateral motor functions or receiving contralateral sensory input
    c. occurs with all major spinal tracts but not cranial nerves
    d. a and b
    e. all of the above

58. The waxy material in the external auditory canal (meatus) is the product of:
    a. ceruminous glands
    b. endolymphatic sacs
    c. tarsal glands
    d. lacrimal glands
    e. none of the above

59. A stye is an infection of a/the
    a. tarsal gland
    b. sebaceous gland
    c. conjunctiva
    d. cornea
    e. supercilia

60. Name three (3) ganglia:

61. All of the following plexus - nerve relationships are correct EXCEPT
    a. brachial plexus and radial nerve
    b. sacral plexus and the sciatic nerve
    c. lumbar plexus and the median nerve
    d. cervical plexus and the phrenic nerve
    e. none of the above; all are correct

62. The muscle(s) responsible for controlling lens shape is/are
    a. ciliary muscles
    b. extrinsic eye muscles
    c. iris
    d. ora serrata
    e. all of the above

63. Within each intervertebral foramen, an anterior root and its corresponding posterior root unite to form a
    a. spinal nerve
    b. cranial nerve
    c. motor nerve
    d. sensory nerve
    e. all of the above are formed this way

64. Most motor and sensory pathways decussate, which means that they
    a. form an X: cross over from one side of the body to the other side at some point
    b. travel relatively linearly and remain on the same side of the body
    c. conduct information about limb position
    d. conduct motor information
    e. do not have paired tracts

65. The cauda equina is
    a. white matter
    b. gray matter
    c. axons
    d. nerves
    e. hair

Part II: [30 pts]: Answer ***both*** clearly and completely on back page. Diagrams or sketches ***are required***. *15 pts each*

1. Draw the structure of the ear, labeling the major structures for hearing and equilibrium. Trace the path of sound, and briefly explain how we hear, and how we hear different pitches.

2 a. Sketch the path of light through the eye, and label your sketch. Be sure to include all of the clear structures, the spaces, cavities and chambers, and indicate what material fills each space. Complete the tunics to surround the eye, labeling the posterior portions as well.

b. Describe the retina layers in detail (a sketch will help), and explain, briefly, what occurs in each layer. Trace (list) the neural pathway from the receptor to the site in the brain that allows us to be ***conscious*** of "seeing".

Part III: [30 pts]: Choose 2 of 5 (an omitted question may be used as your 5-point bonus if you choose) *15 pts each*

1. a. Sketch a cross section of the spinal cord including a spinal nerve in detail and label its parts. It is NOT necessary to include the ascending & descending tracts. DO include the proximal components of the spinal nerve: input and output paths, and the beginning of the intact spinal nerve.

b. Sketch a simple reflex and briefly describe its function. How could this become a more complex reflex?

2. Fill in the following table:

	ANS-sympathetic NS	ANS-parasympathetic NS
cranial nerves (which?)		
spinal nerves (which?)		
ganglia name 3; where are they?		
functions		
myelinated or unmyelinated (M/U)?		
preganglionic fiber		
post-ganglionic fiber		
neurotransmitter ?		
preganglionic fiber		
post-ganglionic fiber		
*describe the pathway from cell body to synapse **in detail** (location of cell body, spinal root, ramus, etc)*		
preganglionic fiber		
post-ganglionic fiber		

3. List 5 spinal tracts. For each, state where (which region) it is found, and its function (in general terms). Be sure to include at least 2 ascending and 2 descending tracts [that is, 2 of one and 3 of the other]. *Bonus: what is the benefit of having a tract decussate or not decussate? If you were engineering, say, an android, how would you arrange its wiring? Explain briefly.*

name of tract	asc/desc	region	function	other detail if nec	decussation

4. Fill in the following table: describe each brain region, in terms of secondary vesicle:

Vesicle	lumen	wall	floor	roof

5. Matching: Choose the [single] best match. An answer may be used more than once, or not at all.

_____ Broca's area
_____ coordinate fine motor function
_____ primary olfactory center (smell)
_____ primary visual area (sight)
_____ primary auditory area (hearing)
_____ primary somatic motor cortex
_____ primary somatic general sense cortex
_____ primary auditory & visual memory center
_____ postcentral gyrus
_____ relay center for (most) sensory afferents
_____ direct control of autonomic nervous system
_____ integrate conscious sensory and motor funct.
_____ first relay for visual afferents including for reflexes
name it : _____
_____ first relay for auditory afferents including for reflexes
name it : _____
_____ regulate endocrine system
_____ prefrontal gyrus
_____ bridge between medulla and mesencephalon
_____ basic life functions - just enough to stay alive

a. frontal lobe
b. parietal lobe
c. insula
d. occipital lobe
e. temporal lobe
f. thalamus
g. hypothalamus
h. mesencephalon
k. pons
m. cerebellum
p. medulla oblongata
s. reticular formation
x. other - you ***must*** name it

BONUS: WRITE A QUESTION THAT YOU STUDIED FOR, AND FORGETFUL ME, I NEGLECTED TO ASK. ANSWER YOUR QUESTION. PLEASE ASK YOURSELF SOMETHING YOU CAN ANSWER WELL! PLEASE ANSWER THE QUESTION YOU ACTUALLY ASK. [UP TO 5 POINTS AWARDED BASED ON QUESTION & ANSWER] YOU MAY ANSWER ONE ADDITIONAL QUESTION IN PART III ***INSTEAD***.