Class Assignment - 2

1. Place the following events in chronological order from 1-8:

_____Na+ enters the cell, and depolarization occurs to approximately +30 mV.

_____The voltage across the cell membrane is -70 mV, the resting membrane potential.

_____Upon reaching the peak of the action potential, the VG Na+ channels are inactivated by the closing of their inactivation gate and the activation gate of each VG K+ channel opens.

_____VG K+ channels close by the closing of their activation gate, and the resting membrane potential is gradually restored.

_____An excitatory post-synaptic potential depolarizes the membrane to threshold and the activation gate of VG Na+ channels open.

_____Upon returning to the resting membrane potential, VG Na+ channels are reset by opening of the inactivation gate and the closing of the activation gate.

_____VG K+ channels are slow to close, resulting in an excess of K+ efflux and hyperpolarization.

_____Depolarization occurs as K+ flows out of the cell.

2. Determine whether statement is true or false. If statement is false, give reason for the same. Before a second action potential can be generated, the concentration of sodium and potassium on either side of the cell membrane must be fully restored.

(A) True (B) False

3. Determine whether statement is true or false. If statement is false, give reason for the same. The strength of an action potential is represented by the amplitude of the wave. A stronger stimulus will generate an action potential with a higher peak than a weaker stimulus.

(A) True (B) False

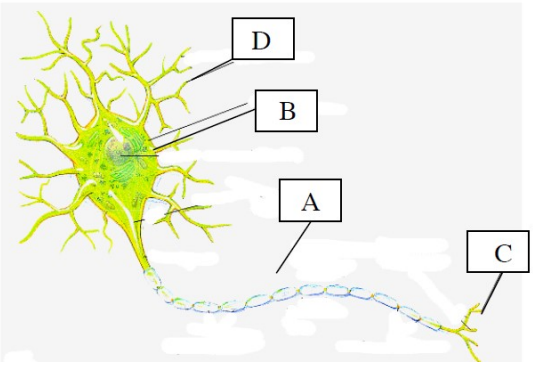
4. Identify the major parts of the neuron shown here by putting the appropriate letter in each box for the structure the connected to that box.

(A) _____

(B) _____

(C) _____

(D) _____



5. Action potential:

(A) is a graded potential.

(B) is produced by sub threshold stimulus.

(C) starts with repolarization caused by outward movement of Cl^-.

(D) is conducted slower in thin nerve fibers.

6. Myelin sheath:
(A) Present in the myelinated and unmyelinated nerve fibers.
(B) Formed of lipoprotein complex and acts as electric insulator.
(C) It is formed of successive wrappings of the membrane of Schwann cells.
(D) It is the cause of decreased conduction of nerve impulse.

7. As regard conduction of action potential in a nerve:
(A) in thick myelinated nerve fibers can reach up to 120 meter / second.
(B) can be increased by increase calcium.
(C) can be increased by cooling.
(D) is conducted with decrement.

8. During depolarization:
(A) voltage activated Na+ channels open.
(B) the membrane becomes impermeable to Na+.
(C) when membrane potential reaches -55 m.v Na+& K+ fluxes occur at the same time.
(D) K+ ions diffuse outside.

9. Repolarization:
(A) Occurs at first gradual then becomes fast.
(B) Results from closure of sodium gates and opening of potassium gates.
(C) is represented by the ascending limb of the spike.
(D) is followed by appearance of response.

10. Continuous conduction:
(A) occurs in myelinated nerve fibers.
(B) occurs by jumping of charges from one node of Ranvier to another.
(C) is relatively slow 0.5-2.0 meter / second.
(D) occurs in the neuro-muscular junction.

11. Match the columns:

Column I	**Column II**
(1) Includes both phagocytosis and pinocytosis	(i) Endocytosis
(2) Secretory vesicles fuse with the cell membrane, and the contents of the vesicle are eliminated from the cell.	(ii) Exocytosis

12. In monophasic action potential:
(A) One electrode is put inside and the other is put outside the same nerve fiber.
(B) The spike is a large wave of short duration.
(C) The spike is followed by positive after potential then negative after potential.
(D) The ascending limb of the spike is due to K+ efflux.

13. Match these terms with the correct statement or definition:

Axon	Dendrite
Cell body	Myelin sheath
Collateral axon	Nissl bodies

_____Location of the nucleus and source of information for protein synthesis.
_____Areas of rough endoplasmic reticulum concentration in the cell body.
_____Usually receives information and transmits it to the cell body.
_____Long cell process from the cell body; conducts action potentials.
_____Branch of an axon.
_____Insulating layer of cells around an axon.

14. Match the following:

Match these terms with the cell parts labeled in figure 3.2:

Cell membrane
Centrioles
Cilia
Golgi apparatus
Lysosomes
Microvilli
Mitochondrion
Nuclear envelope
Nucleus
Nucleolus
Phagocytic vesicle
Cell membrane
Ribosome
Rough endoplasmic reticulum
Secretory vesicle
Smooth endoplasmic reticulum
Vesicles

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
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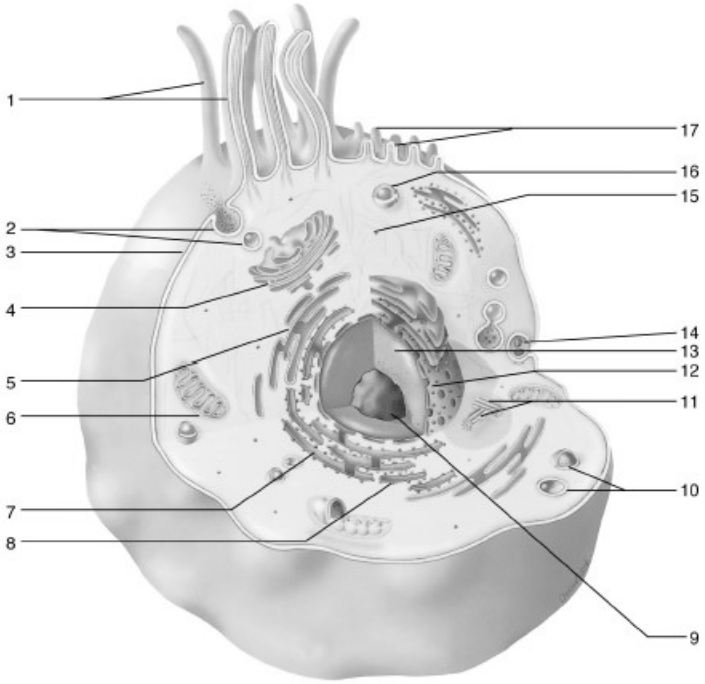
17. _____



15. Two proteins, myoglobin and hemoglobin, are compared.

1. _____ Which characteristics are shared by these two proteins?

(A) They both are globular proteins containing the common amino acids, porphyrin, and iron.
(B) They both have closely related primary, secondary, tertiary, and quaternary structures.
(C) They both are composed of multiple subunits each of which contains a heme prosthetic group.
(D) They both have similar molecular weights and bind one oxygen molecule per protein molecule.

2. _____ Which is a property of protein tertiary structure?

(A) Tertiary structures usually contain hydrocarbon R-groups in the interior of the protein where they can form hydrogen bonds.
(B) Tertiary structures usually contain hydroxyl R-groups on the exterior of the protein where they can favorably interact with water.
(C) A protein's tertiary structure can be predicted if the amino acid sequence is known by performing the Edman degradation.
(D) A protein's tertiary structure can be maintained by covalent salt bridges and non-covalent disulfide bridges.

3. _____ Which is a characteristic of protein quaternary structure?

(A) A protein composed of identical subunits has quaternary structure but not tertiary structure.

(B) A protein composed of non-identical subunits contains two polypeptide chains with opposite charges.

(C) The quaternary structure of a multimeric protein always includes covalent crosslinks between the subunits.

(D) The quaternary structure of a multimeric protein always depends upon the primary structure of the subunits.

4. _____ Which is a property of tertiary structure and quaternary structure?

(A) Both structures are stabilized by numerous covalent hydrophobic and hydrophilic interactions.

(B) Both structures have specific shapes that depend upon the amino acid sequence of the protein.

(C) Both structures form so that polar amino acid R-groups are found mainly in the interior of the protein.

(D) Both structures must contain multiple α-helices and β-pleated sheets connected by turns.

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