

**BIO303**  
**Unit 3 Quiz**

1. Following is a list of steps that occur during synaptic transmission. Please order this list from the first step to the last step.
- A) Neurotransmitters diffuse across the synaptic cleft.
  - B) Voltage-gated calcium channels open.
  - C) Post-synaptic neuron membrane is depolarized.
  - D) Neurotransmitters bind to their receptors on the postsynaptic membrane.
  - E) Synaptic vesicles containing a neurotransmitter fuse with the cell membrane.
  - F) The neurotransmitter is degraded or metabolized.

Refer to the reading, "Presynaptic and Postsynaptic Elements" (subunit 3.1.1).

2. After neurotransmitters bind their receptors on the postsynaptic membrane, they need to be removed from the synaptic cleft. Name two mechanisms by which neurotransmitters are removed from the synaptic cleft, choosing from the options below.
- I. Neurotransmitters diffuse into the postsynaptic neurons.
  - II. Neurotransmitters are retaken up into the presynaptic membrane by reuptake transporters.
  - III. Neurotransmitters freely diffuse away from the postsynaptic membrane.
  - IV. Neurotransmitters are metabolized by enzymes in the synapse.
- A) I and II
  - B) I and III
  - C) II and IV
  - D) II and III

Refer to the reading, "Presynaptic and Postsynaptic Elements" (subunit 3.1.1).

3. \_\_\_\_\_ occur at gap junctions, which consist of channels which cross the neuron membranes of both cells, while \_\_\_\_\_ involve the release of a neurotransmitter into the synaptic cleft, which the neurotransmitter diffuses across and binds its receptor. Fill in the blanks.
- A) Gap synapses, electrical synapses
  - B) Electrical synapses, chemical synapses
  - C) Chemical synapses, electrical synapses
  - D) Action synapses, chemical synapses



Refer to the readings, “Electrical Synapse Members” (subunit 3.1.3), “Chemical Synapse Members” (subunit 3.1.4), “Electrical Synapse” (subunit 3.2), and “Chemical Synapses” (subunit 3.3).

4. Which is a more rapid form of synaptic transmission?
- A) Electrical synapses
  - B) Chemical synapses
  - C) Action synapses
  - D) Gap synapses

Refer to the readings, “Electrical Synapse Members (subunit 3.1.3), “Chemical Synapse Members” (subunit 3.1.4), “Electrical Synapse” (subunit 3.2), and “Chemical Synapses” (subunit 3.3).

5. Action potentials that increase the likelihood of a postsynaptic action potential occurring are called:
- A) Inhibitory postsynaptic
  - B) Neutral postsynaptic
  - C) Excitatory postsynaptic
  - D) Glutamatergic postsynaptic

Refer to the reading, “Synaptic Crosstalk” (subunit 3.4).

6. Which of the following most accurately describes the summation of synaptic potentials?
- A) EPSP are added and IPSP are subtracted algebraically to determine the behavior of the postsynaptic neuron.
  - B) EPSP are subtracted and IPSP are added algebraically to determine the behavior of the postsynaptic neuron.
  - C) Both EPSP and IPSP are multiplied and usually result in an action potential of the postsynaptic neuron.
  - D) All of the above.

Refer to the reading, “Summation of Potentials” (subunit 3.4.3).

7. Which of the following is NOT an amino acid neurotransmitter?
- A) GABA
  - B) Glycine
  - C) Glutamate
  - D) Glutamine



Refer to the reading, "Amino Acids" (subunit 3.5.3).

8. Which of the following is a catecholamine neurotransmitter?
- A) Acetylcholine
  - B) Glutamate
  - C) Serotonin
  - D) Catecholamate

Refer to the reading, "Biogenic Amines" (subunit 3.5.4).

9. Ionotropic receptors transport \_\_\_\_\_ and metabotropic receptors activate \_\_\_\_\_. Fill in the blanks.
- A) Neurotransmitters
  - B) Glucose
  - C) G-proteins
  - D) Action potentials
  - E) Cations
  - F) Ions

Refer to the reading, "Neurotrophin Receptor Families" (subunit 3.6).

10. Activation of metabotropic receptors results in several downstream events. Which of the following is NOT one of the downstream events?
- A) Opening of ion channels
  - B) Activation of G-proteins
  - C) DNA transcription
  - D) Synthesis of more neurotransmitters

