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BIOLOGY MCQs

NEURONS

50 Solved & Explained

- ✓ Correct answers ticked
- Explanation below every MCQ
- Exam-focused practice set



Biology | Nervous System

Study smart. See clearly.

Part 1: Structure and Types of Neurons

Question 1

The structural and functional unit of the nervous system is the:

A Nephron

B **Neuron** ✓

C Neuroglia

D Synapse

✓ **Answer: (B) Neuron**

Explanation: A neuron is the excitable cell that receives, integrates and transmits information as electrical and chemical signals. A nephron is the unit of the kidney, and neuroglia are supporting cells.

Question 2

Which part of a neuron receives incoming signals from other neurons?

A Axon

B Myelin sheath

C **Dendrites** ✓

D Axon terminal

✓ **Answer: (C) Dendrites**

Explanation: Dendrites are short, branched processes that carry impulses toward the cell body. The axon carries impulses away from the cell body.

Question 3

The cell body of a neuron is also known as the:

A **Soma (perikaryon)** ✓

B Axolemma

C Neurilemma

D Telodendron

✓ **Answer: (A) Soma (perikaryon)**

Explanation: The soma, or perikaryon, contains the nucleus and most organelles. The axolemma is the axon membrane, and telodendria are the terminal branches of the axon.

Question 4

Nissl granules (Nissl bodies) are composed of:

A Smooth endoplasmic reticulum and lysosomes

B Golgi bodies and centrioles

C Mitochondria and peroxisomes

D Rough endoplasmic reticulum and free ribosomes ✓

✓ **Answer: (D) Rough endoplasmic reticulum and free ribosomes**

Explanation: Nissl bodies are clusters of rough ER and ribosomes. They make proteins and enzymes needed by the neuron, and they stain darkly with basic dyes.

Question 5

Nissl granules are absent from the:

A Cell body

B Axon and axon hillock ✓

C Proximal dendrites

D Region around the nucleus

✓ **Answer: (B) Axon and axon hillock**

Explanation: Nissl granules lie in the cell body and extend into the dendrites, but they are absent from the axon and the axon hillock.

Question 6

The region of a neuron where an action potential is usually initiated is the:

A	**Axon hillock (initial segment)**	✓
B	Dendritic spine	
C	Synaptic knob	
D	Neurilemma	

✓ Answer: (A) Axon hillock (initial segment)

Explanation: The axon hillock has a high density of voltage-gated Na^+ channels and the lowest threshold, so it acts as the trigger zone of the neuron.

Question 7

The neurons of the dorsal root ganglia are mostly:

A	Multipolar	
B	Bipolar	
C	**Pseudounipolar**	✓
D	Anaxonic	

✓ Answer: (C) Pseudounipolar

Explanation: Dorsal root ganglion neurons have a single process that divides into two branches close to the cell body. One branch goes to the periphery and the other goes to the spinal cord.

Question 8

Neurons with one axon and one dendrite, found in the retina, are called:

A Unipolar neurons

B Multipolar neurons

C Pseudounipolar neurons

D **Bipolar neurons** ✓

✓ **Answer: (D) Bipolar neurons**

Explanation: Bipolar neurons have two processes, one axon and one dendrite. They occur in the retina, the olfactory epithelium and the inner ear.

Question 9

The most common type of neuron in the central nervous system is:

A Unipolar

B **Multipolar** ✓

C Bipolar

D Pseudounipolar

✓ **Answer: (B) Multipolar**

Explanation: Multipolar neurons have one axon and several dendrites. Motor neurons and interneurons are examples.

Question 10

In the peripheral nervous system, the myelin sheath is formed by:

A	**Schwann cells**	✓
B	Astrocytes	
C	Microglia	
D	Oligodendrocytes	

✓ Answer: (A) Schwann cells

Explanation: Each Schwann cell wraps around one segment of a single axon. Oligodendrocytes form myelin in the CNS.

Question 11

In the central nervous system, the myelin sheath is formed by:

A	Schwann cells	
B	Astrocytes	
C	Ependymal cells	
D	**Oligodendrocytes**	✓

✓ Answer: (D) Oligodendrocytes

Explanation: One oligodendrocyte can myelinate segments of several axons at once. Schwann cells myelinate only a single segment of one axon.

Question 12

The small gaps in the myelin sheath along an axon are called:

A Synaptic clefts

B Axon hillocks

C **Nodes of Ranvier** ✓

D Internodes

✓ **Answer: (C) Nodes of Ranvier**

Explanation: Nodes of Ranvier are unmyelinated gaps with many voltage-gated channels. The stretch of myelin between two nodes is an internode.

Question 13

The myelin sheath is made up mainly of:

A **Lipids (phospholipids and sphingomyelin)** ✓

B Carbohydrates

C Nucleic acids

D Inorganic salts

✓ **Answer: (A) Lipids (phospholipids and sphingomyelin)**

Explanation: Myelin is about 70 to 80 percent lipid. This makes it a good electrical insulator, which increases the speed of conduction.

Part 2: Membrane Potential and Action Potential

Question 14

Saltatory conduction of impulses occurs in:

A Non-myelinated nerve fibres

B **Myelinated nerve fibres** ✓

C Smooth muscle cells

D Sensory receptors

✓ **Answer: (B) Myelinated nerve fibres**

Explanation: In myelinated fibres the action potential jumps from one node of Ranvier to the next. This is faster and uses less energy than continuous conduction.

Question 15

The resting membrane potential of a typical neuron is about:

A +70 mV

B 0 mV

C **−70 mV** ✓

D +30 mV

✓ **Answer: (C) −70 mV**

Explanation: At rest the inside of the neuron is negative relative to the outside, at around −70 mV. This is called the polarized state.

Question 16

The sodium–potassium pump moves ions in which ratio for each ATP used?

A	2 Na^+ out and 3 K^+ in
B	3 Na^+ in and 2 K^+ out
C	1 Na^+ out and 1 K^+ in
D	**3 Na^+ out and 2 K^+ in** ✓

✓ **Answer: (D) 3 Na^+ out and 2 K^+ in**

Explanation: The Na^+/K^+ ATPase removes 3 Na^+ and brings in 2 K^+ per ATP. It is electrogenic and helps maintain the resting potential.

Question 17

At rest, the neuron membrane is most permeable to:

A	**K^+** ✓
B	Na^+
C	Ca^{2+}
D	Mg2+

✓ **Answer: (A) K^+**

Explanation: Many K^+ leak channels are open at rest, so K^+ diffuses out and leaves the inside negative. Na^+ channels are mostly closed.

Question 18

Which ion is present at a higher concentration outside the neuron at rest?

A K^+

B Negatively charged proteins

C **Na^+** ✓

D Phosphate ions

✓ **Answer: (C) Na^+**

Explanation: Na^+ is high in the extracellular fluid, while K^+, proteins and phosphates are high inside the cell.

Question 19

The threshold potential of a typical neuron is about:

A −70 mV

B **−55 mV** ✓

C 0 mV

D +30 mV

✓ **Answer: (B) −55 mV**

Explanation: When depolarization reaches about −55 mV, voltage-gated Na^+ channels open in large numbers and an action potential is fired.

Question 20

The depolarization phase of an action potential is caused by:

A Efflux of K^+

B Influx of Cl^-

C Efflux of Na^+

D Rapid influx of Na^+ through voltage-gated channels ✓

✓ **Answer: (D) Rapid influx of Na^+ through voltage-gated channels**

Explanation: Voltage-gated Na^+ channels open quickly, Na^+ rushes in, and the inside becomes positive. This is a positive feedback process.

Question 21

The repolarization phase of an action potential is mainly due to:

A Opening of voltage-gated Na^+ channels

B Influx of Ca^{2+}

C Efflux of K^+ through voltage-gated K^+ channels ✓

D Closure of K^+ leak channels

✓ **Answer: (C) Efflux of K^+ through voltage-gated K^+ channels**

Explanation: Na^+ channels inactivate while voltage-gated K^+ channels open. K^+ leaves the cell and the inside becomes negative again.

Question 22

The all-or-none law of the action potential means that:

A	**It either occurs fully or does not occur at all**	✓
B	Its size increases with stimulus strength	
C	It fires only after repeated stimuli	
D	It decays as it travels along the axon	

✓ **Answer: (A) It either occurs fully or does not occur at all**

Explanation: Once the threshold is reached, the action potential has a fixed size and does not weaken along the axon. A stronger stimulus increases the frequency of firing, not the size.

Question 23

The undershoot (hyperpolarization) after an action potential is due to:

A	Continued Na^+ influx	
B	**Slow closure of voltage-gated K^+ channels**	✓
C	Stopping of the Na^+/K^+ pump	
D	Opening of Ca^{2+} channels	

✓ **Answer: (B) Slow closure of voltage-gated K^+ channels**

Explanation: K^+ channels close slowly, so extra K^+ leaves the cell and the potential falls below the resting level for a short time.

Question 24

During the absolute refractory period:

A	A weaker stimulus can trigger an action potential	
B	A stronger-than-normal stimulus can trigger an action potential	
C	The membrane is at resting potential	
D	**No stimulus, however strong, can trigger another action potential**	✓

✓ Answer: (D) No stimulus, however strong, can trigger another action potential

Explanation: Na^+ channels are open or inactivated, so they cannot reopen straight away. This ensures one-way travel of the impulse.

Question 25

A stronger-than-normal stimulus can start a new action potential during the:

A	**Relative refractory period**	✓
B	Absolute refractory period	
C	Depolarization phase	
D	Threshold phase	

✓ Answer: (A) Relative refractory period

Explanation: During the relative refractory period some Na^+ channels have recovered and the membrane is hyperpolarized, so a stronger stimulus is needed.

Question 26

The membrane potential at the peak of an action potential is about:

A	−70 mV	
B	−55 mV	
C	**+30 to +40 mV**	✓
D	−90 mV	

✓ Answer: (C) +30 to +40 mV

Explanation: Na^+ influx reverses the polarity of the membrane, so the inside becomes positive and reaches about +30 to +40 mV.

Question 27

Conduction velocity of a nerve fibre is increased by:

A Smaller diameter and no myelin

B Lower temperature

C Fewer Na^+ channels

D Larger axon diameter and myelination ✓

✓ **Answer: (D) Larger axon diameter and myelination**

Explanation: A wider axon offers less resistance and myelin insulates it. Both increase the speed at which impulses are conducted.

Question 28

Which nerve fibres conduct impulses fastest (about 80 to 120 m/s)?

A C fibres

B Large, heavily myelinated Aα fibres ✓

C B fibres

D Aδ fibres

✓ **Answer: (B) Large, heavily myelinated Aα fibres**

Explanation: Aα fibres carry proprioception and motor signals very fast. Unmyelinated C fibres are the slowest, at about 0.5 to 2 m/s.

Part 3: Synapse and Neurotransmitters

Question 29

A synapse is the junction between:

A	**A neuron and another neuron or an effector cell**	✓
B	Two neuroglial cells	
C	Two myelin segments	
D	A blood vessel and a neuron	

✓ Answer: (A) A neuron and another neuron or an effector cell

Explanation: At a synapse, information passes from a presynaptic neuron to a postsynaptic neuron, muscle fibre or gland cell.

Question 30

The width of a typical chemical synaptic cleft is about:

A	2 nm	
B	200 nm	
C	**20 nm**	✓
D	2 µm	

✓ Answer: (C) 20 nm

Explanation: The cleft is about 20 nm wide, which is wide enough that neurotransmitter must diffuse across it. Gap junctions are only about 2 to 4 nm wide.

Question 31

Neurotransmitters are stored in the axon terminal in:

A Nissl granules

B **Synaptic vesicles** ✓

C Neurofibrils

D Nodes of Ranvier

✓ **Answer: (B) Synaptic vesicles**

Explanation: Synaptic vesicles hold neurotransmitter molecules until an action potential arrives and causes them to be released by exocytosis.

Question 32

Which ion triggers the release of neurotransmitter from the axon terminal?

A Na^{+}

B K^{+}

C Cl^{-}

D **Ca^{2+}** ✓

✓ **Answer: (D) Ca^{2+}**

Explanation: When the action potential reaches the terminal, voltage-gated Ca^{2+} channels open. The Ca^{2+} entering the terminal makes vesicles fuse with the membrane.

Question 33

The neurotransmitter released at the neuromuscular junction is:

A	**Acetylcholine**	✓
B	Dopamine	
C	GABA	
D	Serotonin	

✓ **Answer: (A) Acetylcholine**

Explanation: Motor neurons release acetylcholine, which binds to nicotinic receptors on the muscle fibre and causes contraction.

Question 34

Which enzyme breaks down acetylcholine in the synaptic cleft?

A	Monoamine oxidase	
B	Choline acetyltransferase	
C	**Acetylcholinesterase**	✓
D	Carbonic anhydrase	

✓ **Answer: (C) Acetylcholinesterase**

Explanation: Acetylcholinesterase splits acetylcholine into choline and acetate, which ends the signal. Choline acetyltransferase makes acetylcholine.

Question 35

The main inhibitory neurotransmitter in the brain is:

A Glutamate

B Acetylcholine

C Norepinephrine

D **GABA** ✓

✓ **Answer: (D) GABA**

Explanation: GABA opens Cl^- channels on the postsynaptic membrane and makes the neuron less likely to fire. Glycine is the main inhibitory transmitter in the spinal cord.

Question 36

The main excitatory neurotransmitter in the central nervous system is:

A GABA

B **Glutamate** ✓

C Glycine

D Serotonin

✓ **Answer: (B) Glutamate**

Explanation: Glutamate opens cation channels and depolarizes the postsynaptic cell. It is important in learning and memory.

Question 37

Parkinson's disease is associated with a deficiency of:

A	**Dopamine**	✓
B	Serotonin	
C	Glutamate	
D	Histamine	

✓ Answer: (A) Dopamine

Explanation: Dopamine-producing neurons of the substantia nigra degenerate in Parkinson's disease. This causes tremor, rigidity and slow movement.

Question 38

Chemical synaptic transmission is one-way because:

A	The axon has no ion channels	
B	Dendrites cannot conduct impulses	
C	**Neurotransmitter is released only from the presynaptic terminal and its receptors are on the postsynaptic membrane**	✓
D	Myelin blocks backward flow	

✓ Answer: (C) Neurotransmitter is released only from the presynaptic terminal and its receptors are on the postsynaptic membrane

Explanation: Only the presynaptic terminal has synaptic vesicles, and only the postsynaptic membrane has the receptors. So the signal can travel in one direction only.

Question 39

An excitatory postsynaptic potential (EPSP) is:

A	A hyperpolarization that moves the membrane away from threshold	
B	A fixed-size all-or-none spike	
C	A fall in neurotransmitter release	
D	**A small depolarization that moves the membrane toward threshold**	✓

✓ **Answer: (D) A small depolarization that moves the membrane toward threshold**

Explanation: An EPSP is a graded potential. Many EPSPs can add together (summation) at the axon hillock to reach threshold.

Question 40

An inhibitory postsynaptic potential (IPSP) is caused mainly by:

A Influx of Na^+

B Influx of Cl^- or efflux of K^+ ✓

C Influx of Ca^{2+}

D Closure of K^+ channels

✓ **Answer: (B) Influx of Cl^- or efflux of K^+**

Explanation: Entry of Cl^- or exit of K^+ makes the inside more negative (hyperpolarization). The neuron then moves further from threshold.

Question 41

Electrical synapses transmit signals through:

A Gap junctions ✓

B Synaptic vesicles

C Neurotransmitter receptors only

D Myelin bridges

✓ **Answer: (A) Gap junctions**

Explanation: Gap junctions form channels between cells and let ions flow directly. Transmission is very fast and can go in both directions.

Part 4: Neuroglia, Reflex Arc and Clinical Biology

Question 42

Which glial cells contribute to the formation of the blood–brain barrier?

A	Microglia
B	Oligodendrocytes
C	Schwann cells
D	**Astrocytes** ✓

✓ **Answer: (D) Astrocytes**

Explanation: Foot processes of astrocytes surround brain capillaries and help control which substances enter the brain. They also support neurons and regulate K^+.

Question 43

The phagocytic cells of the central nervous system are:

A Astrocytes

B Ependymal cells

C **Microglia** ✓

D Satellite cells

✓ **Answer: (C) Microglia**

Explanation: Microglia are the immune cells of the CNS. They remove debris and microbes.

Question 44

Which cells line the ventricles of the brain and the central canal of the spinal cord?

A Astrocytes

B **Ependymal cells** ✓

C Oligodendrocytes

D Schwann cells

✓ **Answer: (B) Ependymal cells**

Explanation: Ependymal cells are ciliated and help produce and circulate cerebrospinal fluid (CSF).

Question 45

The correct sequence of a simple reflex arc is:

A	**Receptor → sensory neuron → integrating centre → motor neuron → effector**	✓
B	Receptor → motor neuron → integrating centre → sensory neuron → effector	
C	Effector → sensory neuron → integrating centre → motor neuron → receptor	
D	Receptor → integrating centre → effector → sensory neuron → motor neuron	

✓ Answer: (A) Receptor → sensory neuron → integrating centre → motor neuron → effector

Explanation: A reflex arc begins at a receptor and passes through the sensory neuron to the spinal cord or brain. The signal leaves through the motor neuron to the effector.

Question 46

Afferent (sensory) neurons carry impulses:

A From the CNS to muscles

B From one muscle to another

C **From receptors toward the central nervous system** ✓

D Only from the brain to the spinal cord

✓ **Answer: (C) From receptors toward the central nervous system**

Explanation: Afferent means carrying toward the CNS. Efferent neurons carry impulses away from the CNS.

Question 47

Which neuron carries impulses from the CNS to muscles or glands?

A Afferent neuron

B Interneuron

C Sensory neuron

D **Efferent (motor) neuron** ✓

✓ **Answer: (D) Efferent (motor) neuron**

Explanation: Motor neurons are efferent. They carry commands from the CNS to effectors such as muscles and glands.

Question 48

Interneurons (association neurons) are located mainly in:

A Peripheral nerves

B **The brain and spinal cord** ✓

C Sensory receptors

D Skeletal muscle

✓ **Answer: (B) The brain and spinal cord**

Explanation: Interneurons lie wholly within the CNS, where they link sensory and motor neurons and process information.

Question 49

Multiple sclerosis is an autoimmune disease that damages the:

A **Myelin sheath of CNS neurons** ✓

B Acetylcholine receptors at neuromuscular junctions

C Dopamine-producing neurons of the substantia nigra

D Neuronal mitochondria

✓ **Answer: (A) Myelin sheath of CNS neurons**

Explanation: In multiple sclerosis the immune system attacks myelin, which slows or blocks conduction. Myasthenia gravis, in contrast, affects acetylcholine receptors.

Question 50

Local anaesthetics such as lidocaine block pain by:

A Opening K^+ channels

B Increasing acetylcholine release

C **Blocking voltage-gated Na^+ channels** ✓

D Blocking Ca^{2+} pumps

✓ **Answer: (C) Blocking voltage-gated Na^+ channels**

Explanation: With Na^+ channels blocked, depolarization cannot reach threshold, so no action potential forms and pain signals do not travel to the brain.

Quick Answer Key

1 - B	2 - C	3 - A	4 - D	5 - B
6 - A	7 - C	8 - D	9 - B	10 - A
11 - D	12 - C	13 - A	14 - B	15 - C
16 - D	17 - A	18 - C	19 - B	20 - D
21 - C	22 - A	23 - B	24 - D	25 - A
26 - C	27 - D	28 - B	29 - A	30 - C
31 - B	32 - D	33 - A	34 - C	35 - D
36 - B	37 - A	38 - C	39 - D	40 - B
41 - A	42 - D	43 - C	44 - B	45 - A
46 - C	47 - D	48 - B	49 - A	50 - C

Thank You!

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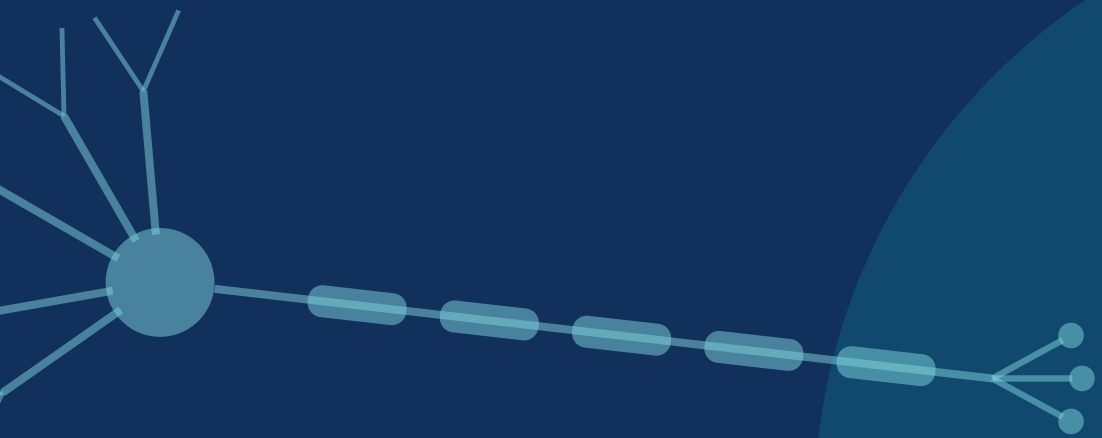

Keep learning. Keep growing.