

# PAPER- 2 ANIMAL PHYSIOLOGY

## SEMESTER – II, INTERNAL – II

### I) Choose the correct options:

- 1) Which of the following ions is primarily responsible for triggering muscle [C] contraction?  
A. Sodium ( $\text{Na}^+$ ) B. Potassium ( $\text{K}^+$ ) C. Calcium ( $\text{Ca}^{2+}$ ) D. Chloride ( $\text{Cl}^-$ )
- 2) The functional unit of a striated muscle fiber is called: [D]  
A. Sarcolemma B. Sarcoplasmic reticulum C. Myofibril D. Sarcomere
- 3) Which of the following is responsible for the rapid conduction of nerve impulses in myelinated neurons? [C]  
A. Synaptic vesicles B. Schwann cells C. Saltatory conduction D. Graded potential
- 4) The resting membrane potential in most neurons is approximately: [B]  
A. +70 mV B. -70 mV C. 0 mV D. -90mV
- 5) Mechanoreceptors are sensitive to: [C]  
A. Light B. Sound C. Pressure and stretch D. Chemicals
- 6) Which hormone is secreted by the alpha cells of the pancreas? [C]  
A. Insulin B. Somatostatin C. Glucagon D. Amylin
- 7) The hypothalamus regulates anterior pituitary activity via: [B]  
A. Nerve fibers B. Hypophyseal portal system C. Spinal cord connections  
D. Direct hormone release
- 8) Luciferin is: [C]  
A. enzyme B. pigment C. light-producing substrate D. light-absorbing molecule
- 9) Bioluminescence is most commonly found in: [B]  
A. Amphibians B. Insects and marine organisms C. Mammals D. Birds

- 10) The “fight or flight” response is mainly mediated by: [C]  
 A. Cortisol from adrenal cortex                      B. Estrogen from ovaries  
 C. Catecholamine’s from adrenal medulla              D. Thyroxine from thyroid gland
- 11) Secretions of endocrine glands [C]  
 a) Chemicals                      b) Genes                      c) Hormones                      d) None
- 12) Study of muscles [A]  
 a) Myology                      b) Cytology                      c) Histology                      d) None
- 13) The term hormone was coined by [B]  
 a) Pasteur                      b) Starling                      c) Harvey                      d) None
- 14) Deficiency of insulin causes [A]  
 a) Diabetes mellitus                      b) diabetes Insipidus                      c) a & b                      d) None
- 15) Adrenal glands are situated on [C]  
 a) Heart                      b) Lungs                      c) Kidneys                      d) None
- 16) Extracellular bioluminescence’s occurs [B]  
 a) Inside                      b) Outside                      c) a & b                      d) None
- 17) P<sup>H</sup> for bioluminescence is [C]  
 a) 7.9                      b) 7.5                      c) 7.6                      d) 7.4
- 18) Pericardial organ receives axons from [D]  
 a) Heart                      b) Lungs                      c) Kidneys                      d) None
- 19) Glial cells are also called [B]  
 a) Neurons                      b) Neuroglia                      c) a & b                      d) None
- 20) Function of photoreceptors [B]  
 a) Sound defection                      b) Vision                      c) a & b                      d) None

## II) FILL IN THE BLANKS:

- 1) The contractile unit of a muscle fiber is called the Sarcomere
- 2) Troponin is the protein that binds to calcium ions during muscle contraction.
- 3) The energy for muscle contraction is provided by ATP (Adenosine Triphosphate)
- 4) During rigor mortis, muscles become stiff due to the lack of ATP.
- 5) The insulating sheath around some axons is called the myelin sheath.
- 6) The gap between two neurons where neurotransmitters are released is known as the synaptic cleft.
- 7) Action potentials are generated when the membrane potential crosses the depolarization threshold.
- 8) The hormone insulin lowers blood glucose levels.
- 9) The posterior pituitary stores and releases oxytocin and vasopressin.
- 10) In fireflies, light is produced in specialized cells called photocytes cells.
- 11) Astrocytes are star shaped cells
- 12) The post commissural organ receives axons from hypothalamus
- 13) Neuroendocrine system is well developed in vertebrates
- 14) Luciferin is responsible for light released by the organism
- 15) Skeletal muscle is also called as striated muscle
- 16) The factor which causes stress is called stressor
- 17) Cortisol is called stress hormone
- 18) Glucagon is secreted by alpha cells of pancreas
- 19) Adrenalin (or) noradrenalin is also called as catecholamines
- 20) Dwarfism is caused by growth hormone deficiency

### III) ANSWER THE FOLLOWING QUESTIONS :

1) Define “sliding filament theory.”

Answer: It explains muscle contraction by the sliding of actin over myosin filaments.

2) What is Saltatory conduction?

Answer: Jumping of action potential between nodes of Ranvier in myelinated neurons

3) Define a sensory receptor.

Answer: A specialized structure that detects and responds to specific stimuli

4) What is the role of luciferase?

Answer: It is an enzyme that catalyzes the oxidation of Luciferin to produce light.

5) What is the role of ATP in muscle contraction?

Answer: Provides energy for the detachment of myosin heads and muscle relaxation.

6) Stress?

Answer: Stress is the body's response to any demand or challenge (stressor) that disrupts its normal physiological balance. It can be physical, emotional, or psychological and triggers hormonal responses, mainly the release of cortisol.

7) Skeletal muscle?

Answer: Skeletal muscles are voluntary, striated muscles attached to bones and help in body movements. They are multinucleated and respond to somatic nervous stimulation.

8) Synapse?

Answer: A synapse is the junction between two neurons where nerve impulses are transmitted. It involves the release of neurotransmitters from the axon terminal of one neuron to the dendrite of another.

9) Neurotransmitter?

Answer: Neurotransmitters are chemical messengers released by neurons at synapses to transmit signals to another neuron, muscle, or gland. Examples include acetylcholine and dopamine.

10) Pineal gland?

Answer: The pineal gland is a small endocrine gland located in the brain that secretes the hormone melatonin. It regulates circadian rhythms and is sensitive to light and dark cycles.

