



DIRECTORATE OF SCHOOL EDUCATION TAMILNADU

12NPCBW2 (2023-24)	NEET - WEEKLY TEST 2	Class : XII Time : 1.40 hrs Total Marks : 400
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Answer key

12th - ZOOLOGY

76. A) Both A and R are true and R is the correct explanation of A.

77. C) The parasympathetic neurons secrete acetylcholine that binds to muscarinic receptors and increases the heart beat.

(Solution: Parasympathetic neurons release the neurotransmitter acetylcholine (ACh), which binds to muscarinic receptors located on the heart's pacemaker cells (specifically the sinoatrial node) and the atrioventricular node. When ACh binds to these muscarinic receptors, it activates a signaling pathway that leads to **decreased heart rate** (negative chronotropic effect) and decreased conduction velocity through the atrioventricular node (negative dromotropic effect).

78. D) (iii) (iv) (i) (ii)

79. B) Right ventricle → Pulmonary arteries → Lungs → Pulmonary veins → Left atrium → Left ventricle

80. B) Stroke

Hypertension (high blood pressure) is a significant risk factor for various cardiovascular diseases, including stroke. When blood pressure remains consistently elevated, it can damage the blood vessels throughout the body, including those in the brain. This vascular damage can lead to conditions such as ischemic stroke (caused by a blocked blood vessel supplying the brain) or hemorrhagic stroke (caused by bleeding into the brain).

81. A) Only (d)

Enucleation allows RBCs to have more space internally for hemoglobin, the protein responsible for carrying oxygen. This maximizes their oxygen-carrying capacity, which is crucial for their role in transporting oxygen throughout the body.

82. D) In the liver, but eliminated mostly through kidneys

The principal nitrogenous excretory compound in humans is urea, which is synthesized in the liver through the process of the urea cycle. However, it is primarily eliminated from the body through the kidneys via urine.

83. C) Uric acid

The primary excretory product of terrestrial arthropods, including insects, is uric acid. This is because uric acid requires very little water for its excretion, making it advantageous for organisms living in arid or terrestrial environments where water conservation is crucial.

84. A) (ii) (iv) (i) (iii)

85. B) (iii) and (iv)

Osmoconformers are able to change their internal osmotic concentration with change in external environment as in marine molluscs and sharks. Osmoregulators maintain their internal osmotic concentration irrespective of their external osmotic environment (example: Otters).

86. C) Nephrolithiasis

Nephrolithiasis, commonly known as kidney stones, refers to the formation of solid crystalline structures (stones) within the urinary tract, typically in the kidneys. These stones can vary in size and composition and may cause symptoms when they obstruct the urinary tract or pass through it.

87. D) Spleen

The spleen is not directly involved in the excretory system. It is primarily responsible for filtering blood, storing red blood cells, and playing a role in the immune system. The liver, lungs, and skin, on the other hand, all contribute to the process of excretion in various ways. The liver helps metabolize and excrete toxins from the body, the lungs excrete carbon dioxide during respiration, and the skin excretes sweat containing metabolic wastes and salts.

88. C) Actin and myosin filaments do not shorten but rather slide past each other

The sliding filament theory explains muscle contraction as the sliding of thin actin filaments over thick myosin filaments within muscle fibers. During contraction, the actin and myosin filaments slide past each other, causing the sarcomere (the basic unit of muscle contraction) to shorten. However, neither the actin nor the myosin filaments themselves shorten; instead, they maintain their lengths while overlapping and sliding past each other, resulting in muscle shortening.

89. A) Sarcoplasmic reticulum

The sarcoplasmic reticulum is a specialized type of endoplasmic reticulum found in muscle cells (specifically, in muscle fibers). It stores and releases calcium ions (Ca^{2+}) that are essential for triggering muscle contraction.

90. D) Depolarization of the sarcolemma

Muscle contraction begins with the depolarization of the sarcolemma (muscle cell membrane) in response to an action potential. This depolarization propagates along the sarcolemma and down the T-tubules, leading to the release of calcium ions from the

sarcoplasmic reticulum, subsequent binding of calcium ions to troponin, formation of cross-bridges between actin and myosin filaments, and ultimately muscle contraction.

91. B) Atrophy

Atrophy refers to the wasting away or decreases in size of muscle tissue due to disuse or lack of physical activity. Chronic bedridden patients who are immobile or unable to use their muscles for an extended period may experience muscle atrophy. This condition is characterized by a reduction in muscle mass, strength, and function. It occurs as a result of decreased protein synthesis and increased protein degradation within the muscle fibers.

92. B) Tarsus - 14 bones

Explanation: The tarsus is a group of bones in the foot that includes the calcaneus, talus, navicular, cuboid, and three cuneiform bones. There are seven tarsal bones in total in each foot, resulting in a total of 14 tarsal bones in both feet. (Cranium - 08 bones, Phalanges - 28 bones (14 each), Carpals - 16 bones (08 each)).

93. A) Osteoporosis

Osteoporosis is a condition characterized by the thinning and weakening of bones, resulting in decreased bone density and increased susceptibility to fractures. Osteoporosis is often asymptomatic until a fracture occurs, commonly affecting weight-bearing bones such as the hip, spine, and wrist.

94. D) Limbic system - consists of fibre tracts that interconnect different regions of brain; controls movement.

The limbic system is not primarily responsible for controlling movement. Instead, it is involved in various functions related to emotion, behavior, motivation, learning, and memory. Components of the limbic system include structures such as the amygdala, hippocampus, and parts of the hypothalamus. While the limbic system does communicate with motor areas of the brain and can influence certain behaviors, it is not the primary control center for movement.

95. C) A is true but R is false

Antidepressant drugs increase the available concentration of these neurotransmitters in the CNS. Hence depression is treatable. The most antidepressant drugs work by increasing the levels of serotonin and/or norepinephrine in the CNS. Selective serotonin reuptake inhibitors (SSRIs), for example, increase the concentration of serotonin in the synaptic cleft by blocking its reuptake, leading to enhanced neurotransmission and potential improvement in mood.

96. D) regulation of body temperature

The hypothalamus is a small region located at the base of the brain, and it plays a crucial role in regulating various physiological processes, including body temperature. It acts as the body's thermostat, helping to maintain a stable internal temperature through mechanisms such as sweating, shivering, and adjustments to blood flow.

97. B) Threshold potential

The threshold potential is the minimum level of stimulation required to trigger an action potential in a neuron. When the membrane potential of a neuron reaches or exceeds the threshold potential, voltage-gated sodium channels open, allowing an influx of sodium ions into the cell, which initiates the depolarization phase of the action potential. Below the threshold potential, no action potential is generated.

98. A) Resting potential -> Action potential -> Depolarization -> Repolarization

99. B) Parasympathetic nervous system

The parasympathetic nervous system is associated with "rest and digest" functions. It promotes activities that conserve and restore energy, including digestion, absorption of nutrients, and relaxation of various organs and tissues. Activation of the parasympathetic nervous system leads to a decrease in heart rate, constriction of pupils, stimulation of salivation, and increased gastrointestinal motility and secretion. It works in opposition to the sympathetic nervous system, which is responsible for "fight or flight" responses and activities that require energy expenditure.

100. B) Whales

Whales, as mammals, indeed have a double circulatory system, similar to other mammals and birds. In the case of double circulation, the blood flows through the heart twice during each complete circuit of the body. One circuit, known as pulmonary circulation, involves the flow of blood between the heart and the lungs for oxygenation. The other circuit, known as systemic circulation, involves the movement of oxygenated blood from the heart to the rest of the body (excluding the lungs), delivering oxygen and nutrients to tissues and organs before returning deoxygenated blood back to the heart.