Unit 8.1. MCQs Set 1

Results

#1. Q1. Physiology broadly studies

☐
(A). Only anatomical structures
☐
(B). Functions and mechanisms in living systems at multiple levels (cells, tissues, organs)
☐
(C). Strictly mental illusions
☐
(D). None

Physiology explains how organisms, organ systems, cells, and biomolecules carry out various chemical or physical functions.

#2. Q2. Fundamental cellular function includes

☐
(A). Protein synthesis, ATP production, membrane transport, cell signaling
☐
(B). None
☐
(C). RBC doping
☐
(D). Strict illusions

Cells perform vital functions such as protein synthesis, energy production, membrane transport, and signaling.

#3. Q3. A typical cell membrane composition is

☐
(A). None
☐
(B). Phospholipid bilayer with embedded proteins, cholesterol, possibly carbohydrates
☐
(C). RBC doping
☐
(D). Pure cellulose

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The fluid mosaic model describes a membrane composed of a phospholipid bilayer with proteins, cholesterol, and carbohydrates on the exterior.

#4. Q4. Resting membrane potential in many neurons is around

☐
(A). +60 mV
☐
(B). –70 mV
☐
(C). 0 mV
☐
(D). None

Due to ion gradients (mainly Na^+ and K^+), the interior of neurons is about –70 mV relative to the outside.

#5. Q5. The sodium-potassium pump (Na^+/K^+-ATPase)

☐
(A). None
☐
(B). Moves 3 Na^+ out, 2 K^+ in, using ATP to maintain gradients crucial for excitability
☐
(C). RBC doping
☐
(D). Infect illusions

The Na^+/K^+-ATPase actively transports ions (3 Na^+ out, 2 K^+ in) using ATP, essential for cell excitability and homeostasis.

#6. Q6. The digestive system’s main function is

☐
(A). None
☐
(B). Ingestion, digestion, absorption of nutrients, excretion of wastes
☐
(C). RBC doping
☐
(D). Pure illusions

The digestive system processes food by ingesting, digesting, absorbing nutrients, and excreting waste.

#7. Q7. Chemical digestion of carbohydrates initiates primarily in the

☐
(A). Stomach by pepsin
☐
(B). Mouth by salivary amylase
☐
(C). None
☐
(D). Large intestine

Salivary amylase in the mouth starts the breakdown of starches into simpler sugars.

#8. Q8. Absorption of most nutrients occurs mainly in

☐
(A). None
☐
(B). The small intestine (duodenum, jejunum)

☐
(C). Stomach
☐
(D). Rectum

The small intestine, with its villi and microvilli, provides a large surface area for nutrient absorption.

#9. Q9. Metabolism includes

☐
(A). None
☐
(B). All chemical reactions in the body, including catabolic and anabolic pathways
☐
(C). RBC doping
☐
(D). Infect illusions

Metabolism encompasses both the breakdown of molecules (catabolism) and the synthesis of compounds (anabolism).

#10. Q10. The liver’s role in carbohydrate metabolism involves

☐
(A). None
☐
(B). Glycogenesis, glycogenolysis, gluconeogenesis, and regulation of blood glucose
☐
(C). RBC doping
☐
(D). Infect illusions

The liver regulates blood glucose by storing (glycogenesis), breaking down (glycogenolysis), and synthesizing (gluconeogenesis) glucose.

#11. Q11. Respiratory system includes

☐
(A). None
☐
(B). Nasal cavity, pharynx, larynx, trachea, bronchi, and lungs
☐
(C). RBC doping
☐
(D). Infect illusions

The respiratory system is composed of structures that facilitate air movement and gas exchange from the nose to the alveoli.

#12. Q12. Breathing (ventilation) means

☐
(A). None
☐
(B). Movement of air in and out of the lungs driven by diaphragm and rib cage
☐
(C). RBC doping
☐
(D). Infect illusions

Ventilation refers to the process of air moving in and out of the lungs via diaphragmatic contraction and rib cage expansion.

#13. Q13. Gas exchange occurs primarily in

☐
(A). None
☐
(B). The alveoli where oxygen diffuses into the blood and carbon dioxide diffuses out
☐
(C). RBC doping
☐
(D). Infect illusions

Alveoli are the primary sites of gas exchange in the lungs due to their thin membranes and high surface area.

#14. Q14. Circulatory system “double circulation” means

☐
(A). None
☐
(B). Blood passes through the heart twice per complete circuit (pulmonary and systemic circulations)
☐
(C). RBC doping
☐
(D). Infect illusions

Double circulation in humans refers to separate pulmonary and systemic circuits.

#15. Q15. Human blood typically is

☐
(A). None
☐
(B). Approximately 55% plasma and 45% cellular components (RBCs, WBCs, platelets)
☐
(C). RBC doping
☐
(D). Infect illusions

Human blood is composed of roughly 55% plasma and 45% cells.

#16. Q16. Hemoglobin binds oxygen most effectively in

☐
(A). None
☐
(B). Environments with high partial pressure of oxygen and a slightly higher pH, as found in the alveoli
☐
(C). RBC doping
☐
(D). Infect illusions

Hemoglobin’s affinity for oxygen is enhanced in conditions typically found in the alveoli, where oxygen levels and pH favor binding.

#17. Q17. The central nervous system (CNS) comprises

☐
(A). None
☐
(B). The brain and spinal cord
☐
(C). RBC doping
☐

(D). Infect illusions

The CNS consists of the brain and spinal cord, which coordinate and control bodily functions.

#18. Q18. The autonomic nervous system (ANS) includes

☐
(A). None
☐
(B). The sympathetic and parasympathetic divisions that regulate involuntary bodily functions
☐
(C). RBC doping
☐
(D). Infect illusions

The ANS comprises the sympathetic and parasympathetic systems which regulate functions such as heart rate, digestion, and respiratory rate.

#19. Q19. Neurophysiology might investigate

☐
(A). None
☐
(B). The electrical properties of neurons, synaptic transmission, and reflex pathways
☐
(C). RBC doping
☐
(D). Infect illusions

Neurophysiology studies the electrical signaling, synaptic communication, and reflex mechanisms in neurons.

#20. Q20. Cerebrospinal fluid (CSF) is found in

☐
(A). None
☐
(B). The brain’s ventricles and the subarachnoid space surrounding the CNS
☐
(C). RBC doping
☐
(D). Infect illusions

CSF circulates in the ventricles and subarachnoid space, cushioning and nourishing the CNS.

#21. Q21. Excretory system primarily includes

☐
(A). None
☐
(B). The kidneys, ureters, urinary bladder, and urethra, which eliminate waste products from the body
☐
(C). RBC doping
☐
(D). Infect illusions

The excretory system consists of organs that filter blood and produce urine, removing waste from the body.

#22. Q22. Acid-base regulation in the body often depends on

☐

(A). None
☐
(B). The bicarbonate buffer system, respiratory CO_2 exhalation, and renal H^+ excretion
☐
(C). RBC doping
☐
(D). Infect illusions

The bicarbonate buffer system, along with respiratory and renal adjustments, maintains blood pH around 7.4.

#23. Q23. Endocrine glands release

☐
(A). None
☐
(B). Hormones directly into the bloodstream to act on distant target tissues
☐
(C). RBC doping
☐
(D). Infect illusions

Endocrine glands secrete hormones into the blood, which then travel to regulate functions in various parts of the body.

#24. Q24. Hormonal functions can be

☐
(A). None
☐
(B). Responsible for regulating metabolism, growth, reproduction, and stress responses
☐
(C). RBC doping
☐
(D). Infect illusions

Hormones play critical roles in controlling metabolism, growth, reproduction, and the body’s reaction to stress.

#25. Q25. The pituitary gland is often called

☐
(A). None
☐
(B). The master gland, as it releases tropic hormones that control other endocrine glands
☐
(C). RBC doping
☐
(D). Infect illusions

The pituitary gland directs the activity of other endocrine glands by secreting various tropic hormones.

#26. Q26. The reproductive system in humans includes

☐
(A). None
☐
(B). The gonads (testes/ovaries), accessory ducts, external genitalia, and associated hormonal regulation
☐
(C). RBC doping
☐
(D). Infect illusions

The human reproductive system comprises the gonads, duct systems, and external structures, all regulated by hormones.

#27. Q27. Human reproductive physiology’s female cycle involves

☐
(A). None
☐
(B). Both the ovarian cycle (follicular phase, ovulation, luteal phase) and the uterine cycle (menstrual, proliferative, secretory phases)
☐
(C). RBC doping
☐
(D). Infect illusions

The female reproductive cycle is characterized by the ovarian cycle and the corresponding uterine cycle.

#28. Q28. Embryonic development in humans sees

☐
(A). None
☐
(B). A progression from cleavage to blastulation, gastrulation, and organogenesis
☐
(C). RBC doping
☐
(D). Infect illusions

Embryonic development follows the stages of cleavage, blastulation, gastrulation, and organogenesis to form a fetus.

#29. Q29. Voluntary movements typically are controlled by

☐
(A). None
☐
(B). Motor signals from the primary motor cortex transmitted via the corticospinal tract to skeletal muscles
☐
(C). RBC doping
☐
(D). Infect illusions

The primary motor cortex sends signals through the corticospinal tract to initiate voluntary movements.

#30. Q30. Involuntary movements might be regulated by

☐
(A). None
☐
(B). Autonomic reflex arcs, spinal cord circuits, and brainstem centers
☐
(C). RBC doping
☐
(D). Infect illusions

Involuntary movements, such as peristalsis, are regulated by reflex arcs and the autonomic nervous system.

#31. Q31. Cellular function includes

☐
(A). None
☐
(B). Maintenance of membrane potential, signal transduction, and overall homeostasis
☐
(C). RBC doping
☐

(D). Infect illusions

Cellular functions encompass maintaining ion gradients, signal transduction, and homeostasis.

#32. Q32. The digestive system’s main proteolytic enzyme in the stomach is

☐
(A). None
☐
(B). Pepsin, which hydrolyzes proteins in an acidic environment
☐
(C). RBC doping
☐
(D). Infect illusions

Pepsin is the primary enzyme in the stomach responsible for breaking down proteins.

#33. Q33. Fat digestion primarily occurs in the

☐
(A). None
☐
(B). Small intestine (duodenum) aided by bile and pancreatic lipase
☐
(C). RBC doping
☐
(D). Infect illusions

Bile emulsifies fats and pancreatic lipase breaks them down in the small intestine.

#34. Q34. The “respiratory quotient (RQ)” is

☐
(A). None
☐
(B). The ratio of CO_2 produced to O_2 consumed, indicative of the substrate being metabolized
☐
(C). RBC doping
☐
(D). Infect illusions

RQ values help determine the predominant nutrient (carbohydrate, fat, or protein) being metabolized.

#35. Q35. In the circulatory system, systolic pressure is

☐
(A). None
☐
(B). The maximum arterial pressure during ventricular contraction
☐
(C). RBC doping
☐
(D). Infect illusions

Systolic pressure is the highest pressure in the arteries during the heartbeat’s contraction phase.

#36. Q36. The “Pacemaker” of the heart is

☐
(A). None

☐
(B). The sinoatrial (SA) node located in the right atrium
☐
(C). RBC doping
☐
(D). Infect illusions

The SA node is the heart’s natural pacemaker, generating electrical impulses to initiate each heartbeat.

#37. Q37. The main function of white blood cells (WBCs) is

☐
(A). None
☐
(B). Defense against infection, phagocytosis, and immune regulation
☐
(C). RBC doping
☐
(D). Infect illusions

WBCs are the cells responsible for immune defense and host protection.

#38. Q38. The central nervous system (CNS) is protected by

☐
(A). None
☐
(B). Meninges (dura, arachnoid, pia), cerebrospinal fluid (CSF), and the blood-brain barrier (BBB)
☐
(C). RBC doping
☐
(D). Infect illusions

The CNS is shielded by protective layers (meninges and CSF) and the selective blood-brain barrier.

#39. Q39. The autonomic nervous system controlling the “fight or flight” response is the

☐
(A). None
☐
(B). Sympathetic division, which releases norepinephrine to prepare the body for stress
☐
(C). RBC doping
☐
(D). Infect illusions

The sympathetic division of the ANS is activated during stress, increasing heart rate and energy availability.

#40. Q40. The kidneys regulate acid-base balance by

☐
(A). None
☐
(B). Secreting hydrogen ions (H^+) and reabsorbing bicarbonate (HCO_3^-) to maintain blood pH
☐
(C). RBC doping
☐
(D). Infect illusions

Renal regulation of acid-base balance involves excreting H^+ and conserving HCO_3^-, which helps maintain pH levels around 7.4.

#41. Q41. The renin-angiotensin-aldosterone system (RAAS) modifies

☐
(A). None
☐
(B). Blood pressure, fluid balance, and electrolyte levels via vasoconstriction and sodium retention
☐
(C). RBC doping
☐
(D). Infect illusions

RAAS plays a key role in controlling blood pressure and fluid balance by affecting vessel tone and sodium reabsorption.

#42. Q42. The pancreas is both exocrine and endocrine. Its endocrine role includes

☐
(A). None
☐
(B). Secretion of insulin and glucagon to regulate blood glucose levels
☐
(C). RBC doping
☐
(D). Infect illusions

The endocrine function of the pancreas involves the release of hormones that control blood sugar levels.

#43. Q43. The thyroid gland hormone that increases metabolic rate is

☐
(A). None
☐
(B). Thyroxine (T4) and triiodothyronine (T3)
☐
(C). RBC doping
☐
(D). Infect illusions

T4 and T3 from the thyroid gland stimulate metabolism and energy production.

#44. Q44. The stress hormone from the adrenal cortex is

☐
(A). None
☐
(B). Cortisol
☐
(C). RBC doping
☐
(D). Infect illusions

Cortisol is the principal glucocorticoid released in response to stress.

#45. Q45. In male reproductive physiology, testosterone is secreted by

☐
(A). None
☐
(B). Leydig cells in the testes
☐
(C). RBC doping
☐
(D). Infect illusions

Leydig cells produce testosterone, which governs male secondary sexual characteristics.

#46. Q46. Ovulation typically occurs around day _____ in a standard 28-day cycle

☐
(A). 28
☐
(B). 14
☐
(C). 7
☐
(D). 5

Ovulation usually occurs around day 14 in a typical 28-day menstrual cycle.

#47. Q47. The cerebellum in the brain helps coordinate

☐
(A). None
☐
(B). Balance, posture, and fine motor control
☐
(C). RBC doping
☐
(D). Infect illusions

The cerebellum plays a crucial role in maintaining balance, coordinating posture, and fine-tuning movements.

#48. Q48. Voluntary movement requires motor signals from

☐
(A). None
☐
(B). The primary motor cortex in the frontal lobe, transmitted via the corticospinal tract to skeletal muscle
☐
(C). RBC doping
☐
(D). Infect illusions

Voluntary movement is initiated in the primary motor cortex, which sends signals through the corticospinal tract to the muscles.

#49. Q49. A reflex arc controlling a knee-jerk response is

☐
(A). None
☐
(B). A monosynaptic stretch reflex involving a sensory neuron directly synapsing with a motor neuron in the spinal cord
☐
(C). RBC doping
☐
(D). Infect illusions

The knee-jerk reflex is a classic monosynaptic reflex, where the sensory neuron directly activates a motor neuron.

#50. Q50. Smooth muscle control in gut peristalsis is mostly

☐
(A). None
☐
(B). Involuntary, modulated by the autonomic nervous system including the enteric nervous system

☐
(C). RBC doping
☐
(D). Infect illusions

Gut peristalsis is controlled by involuntary mechanisms coordinated by the autonomic and enteric nervous systems.

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