



Royal College - Colombo 07

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First Term Test - April 2023

Grade 13

Biology I

09 E I

Two hours

Answer all questions.

- 1) Select correct pair from following
 - 1) Growth - Irreversible changes that occur during the life span of an organism.
 - 2) Coordination - Ability to respond to stimuli from both internal and external environment
 - 3) Evolution - Ability of organisms to change over time as a result of genetic modification.
 - 4) Development - Ability to produce offspring for continuous existence of species
 - 5) Metabolism - Irreversible increase in dry mass
- 2) Which is not a trace element of human body?
 - 1) B 2) Cl 3) Mn 4) Zn 5) F
- 3) Which is incorrect regarding water?
 - 1) The properties of water arise due to attraction of different water molecules
 - 2) High surface tension of water is given due to cohesion between water molecules
 - 3) Due to high specific heat, an organism can release much heat energy with the minimum loss of water
 - 4) Solubility depends on polarity
 - 5) Water has the maximum density at 4°C
- 4) A compound that contains glycosidic bond is
 - 1) Fructose 2) Galactose 3) Ribulose 4) Sucrose 5) Glyceraldehyde
- 5) Which is a structural protein?
 - 1) Keratin 2) Albumin 3) Amylase
 - 4) Myoglobin 5) Hemoglobin
- 6) Which is not a major limiting factor in photosynthesis?
 - 1) Light intensity 2) Temperature 3) Water
 - 4) CO₂ concentration 5) Relative humidity
- 7) Colonization of land by animals began after about
 - 1) 2.7 billion years ago 2) 400 million years ago
 - 3) 1.2 billion years ago 4) 365 million years ago
 - 5) 500 million years ago
- 8) A characteristic feature that can be seen in both Domain Bacteria and Eukarya is
 - 1) Several kinds of RNA polymerase for protein synthesis
 - 2) Membranes lipids are unbranched hydrocarbons
 - 3) Histones associated with DNA are present
 - 4) Introns are present in many genes
 - 5) Initiator amino acid for protein synthesis is methionine

- 9) Select the correct matching between protists and their storage food
- | | | |
|---------------------|---|------------------|
| 1) <i>Sargassum</i> | - | Chrysolaminarin |
| 2) <i>Ulva</i> | - | Floridian starch |
| 3) <i>Gelidium</i> | - | Starch |
| 4) <i>Diatoms</i> | - | oil |
| 5) <i>Euglena</i> | - | Laminarin |
- 10) Which statement is correct regarding seedless vascular plants?
- 1) All club mosses are heterosporous
 - 2) Some species of Lycophytes are nourished by symbiotic fungi
 - 3) Pterophytes are terrestrial and some are epiphytes
 - 4) All *Lycopodium* are homosporous and considered as spike mosses
 - 5) Spores of some species of Pterophytes develop into unisexual gametophyte
- 11) Which of the following statement is correct regarding meristematic tissues in plants?
- 1) Only the lateral meristems and intercalary meristems involve in secondary growth
 - 2) Intercalary meristems are found in some dicots at the bases of stems and leaves
 - 3) Epidermis is replaced by the prederm in *Cycas*
 - 4) Vascular cambium is a lateral meristem which has completely secondary origin
 - 5) Cambium cells consist of short initials with large central vacuole
- 12) A characteristic feature of cells found just below the epidermis in young stem is;
- 1) Secondary cell walls have been thickened by lignin
 - 2) Have the ability to divide mitotically
 - 3) Consist of leucoplasts
 - 4) Long slender and tapered
 - 5) Walls are unevenly thickened
- 13) Which of the following is incorrect regarding the structure of leaves?
- 1) Palisade mesophyll consists of elongated cells, that are arranged in one layer in all dicot plants
 - 2) Spongy mesophyll cells have less chloroplasts than in palisade mesophyll cells
 - 3) Mesophyll cells are not differentiated into two types in monocot leaves
 - 4) Veins in the dicot leaves are highly branched in the mesophyll layer
 - 5) Guard cells are typically bean shaped in angiosperms
- 14) Which of the following is incorrect regarding water potential?
- 1) Turgor pressure is important for support of non woody plants and for cell elongation
 - 2) If a cell has the maximum value for ψ_p , ψ becomes equal to ψ_s
 - 3) If the ψ becomes zero, the cell is said to be in fully turgid state
 - 4) $\psi = \psi_s$ in a flaccid cell
 - 5) ψ_p of a xylem vessel is usually less than -2 MPa
- 15) Which of the following can be taken place by using energy?
- 1) Movement of hydrophilic solutes across the plasma membrane with the help of transport protein.
 - 2) Movement of free water molecules through root hair cells
 - 3) Movement of CO_2 through plasma membrane
 - 4) Taking up water from the xylem by sieve tube
 - 5) Movement of sucrose into sieve tube

- 16) An example for a symbiotic relationship in which both participants are benefited is
- 1) Epiphytic Orchids with a host plant
 - 2) Dodder plant and a mango tree
 - 3) Coralloid roots of *Cycas* with *Anabaena*
 - 4) *Utricularia* and Orchid
 - 5) *Loranthus* and a host plant
- 17) Which of the following nutrient deficiency show/s the symptom of crinkling of leaves?
- 1) Ca
 - 2) Ca and Zn
 - 3) Zn
 - 4) Zn and S
 - 5) P and S
- 18) How do you call the condition of having styles of different length relative to the stamens in the flower?
- 1) Self infertility
 - 2) Heterostyly
 - 3) Unisexuality
 - 4) Bisexuality
 - 5) Dioecious
- 19) Which of the following plant hormones are responsible for delaying leaf senescence and promoting leaf senescence respectively?
- 1) Cytokinins and abscisic acid
 - 2) Abscisic acid and gibberellins
 - 3) Cytokinins and gibberellins
 - 4) Ethylene and cytokinins
 - 5) Auxin and ethylene
- 20) Which of the following is a pre – existing structural defense mechanism?
- 1) Presence of lignin in the cell wall
 - 2) Secondary metabolites in some plants
 - 3) Cork and abscission layers
 - 4) Structure of the epidermal cell walls and thickness
 - 5) Toxic compound present in trichomes
- 21) Which one of the following is correct about the ventilation of the lungs?
- 1) In human it is a negative pressure breathing where air is pushed into lungs
 - 2) Contraction of intercostals muscles and the diaphragm muscles leads to decrease the volume of the thoracic cavity
 - 3) Inhalation and exhalation only depend on the contraction and relaxation of intercostals muscles and diaphragm muscles
 - 4) Additional muscles may be used to aid breathing such as muscles of the neck, back and chest
 - 5) The visceral and parietal pleurae slide smoothly passing each other, increasing the lung volume
- 22) Which one of the following is incorrect about homeostatic control of breathing?
- 1) There are two breathing control centers found in medulla oblongata which are responsible for regulating the breathing rhythm
 - 2) Sensors which detect stretching of the lung tissues are found in the lungs
 - 3) pH change is detected by the sensors in the medulla oblongata and in carotid arteries and aorta
 - 4) The control circuits in medulla increase the depth and rate of breathing when pH increases
 - 5) The regulation of breathing is modulated by additional neural circuits in the pons varoli

- 23) Find the correct relationship
- 1) Annelida – Brain, ventral nerve cord, a pair of ganglia
 - 2) Chordata – Brain, dorsal nerve cord, nerves and ganglia
 - 3) Echinodermata – Nerve cord and radial nerves
 - 4) Arthropoda – Brain, dorsal nerve cords, segmental ganglia
 - 5) Platyhelminthes – Brain longitudinal nerves and ganglia
- 24) The incorrect statement about the transmission of nerve impulses through chemical synapses is,
- 1) Depolarization at the presynaptic terminal causes Ca^{2+} to diffuse into the terminals
 - 2) After passing the nerve impulse to the presynaptic cell, the signal at the presynaptic terminals is terminated
 - 3) The binding of neurotransmitters to the post synaptic membrane, Na^+ and K^+ diffuse across the post synaptic membrane
 - 4) Neurotransmitters bind and activates specific receptors in the post synaptic cell membrane
 - 5) Depolarization takes place in the post synaptic membrane when Na^+ and K^+ diffuse across the post synaptic membrane
- 25) The mismatching relationship about the parts of the eye and respective functions of those part
- 1) Cornea – Involved in refracting light rays to focus on the retina
 - 2) Ciliary body – Hold the lens in place by suspensory ligaments
 - 3) Iris – Prevent penetration of light
 - 4) lens – Refract light rays reflected by objects in front of the eye
 - 5) Vitreous humor – maintain enough intra ocular pressure
- 26) Select the incorrect statement
- 1) Middle ear is an air filled cavity within the temporal bone
 - 2) Oval window is covered by a small bone called incus
 - 3) Inner ear is formed from bony labyrinth
 - 4) Inner ear is composed of vestibule, three semicircular canals and cochlea.
 - 5) Vestibule contains utricle and saccule
- 27) Which of the following is not a type of mechano receptor present in the skin?
- 1) Bulb of Krause
 - 2) Meissner's corpuscle
 - 3) Pacinian corpuscle
 - 4) Markel discs
 - 5) Free nerve endings
- 28) Which of the following is not a hypothalamic hormones that act on the anterior pituitary gland?
- 1) GHRH
 - 2) GnRH
 - 3) PIH
 - 4) ACTH
 - 5) PRH
- 29) A hormone has a tropic as well as non tropic effects is
- 1) TSH
 - 2) ACTH
 - 3) FSH
 - 4) GH
 - 5) LH
- 30) A symptom of hyperthyroidism is
- 1) Bulging of eyes
 - 2) Dry cold skin
 - 3) Constipation
 - 4) Weight gain
 - 5) Lethargy

- 31) The incorrect statement about the lymphatic system is
- 1) It originates from lymph capillaries associated with tissues
 - 2) It contributes to absorb digested end product of the digestive tract
 - 3) The lymph vessels connect with two veins at the base of the neck
 - 4) Lymph nodes are composed of muscle tissue and white blood cells
 - 5) Valves of lymph vessels are important for circulation of the lymph
- 32) Several statement about the human heart are given below
- A) The pericardium is the outer most layer made up of two sacs
 - B) Myocardium consist of conducting fibers responsible for transmitting the heart's electrical signals
 - C) Endocardium consists of cardiac muscles and flattened epithelial cells
- The correct statements from the above
- 1) Only A
 - 2) Only B
 - 3) Only C
 - 4) Only A and B
 - 5) Only A and C
- 33) The correct statement about a person, possessing blood group O is
- 1) Only presence of antigen A in the plasma of erythrocytes
 - 2) No antibodies A in the blood plasma
 - 3) Only presence of antibody B in the plasma of erythrocytes
 - 4) Only presence of Antigen A in the blood plasma
 - 5) No antigen B in the plasma of erythrocytes
- 34) Select the incorrect statement about active immunity
- 1) The long lasting immunity activated against pathogens in the body
 - 2) Resulted by B and T memory cells specific for a pathogen
 - 3) Active immunity is not developed in the artificial immunity.
 - 4) B and T lymphocytes contribute for the active immunity
 - 5) Active immunity can be developed as a result of natural infection of a pathogen
- 35) Select the incorrect statement
- 1) Small amount of CO_2 is transported as free gas dissolved in blood plasma.
 - 2) In addition to hemoglobin, myoglobin transports O_2 in the red blood cells.
 - 3) Leukocytes and platelets are developed from the bone marrow in the bones such as vertebrae, sternum
 - 4) Erythropoietin hormone stimulates the generation of red blood cells.
 - 5) O_2 is transported by binding with hemoglobin presence in red blood cells which lack nuclei
- 36) The correct combination about animal and relevant excretory product is,
- 1) Skate – Ammonia
 - 2) Toad – Urea
 - 3) Tilapia – Uric acid
 - 4) Crocodile – Urea
 - 5) Land snails – Urea



37) Which statement is incorrect regarding the distal convoluted tubule of human kidney?

- 1) Important for regulation of K^+ and Na^+ in body fluids
- 2) K^+ is secreted in to the filtrate actively
- 3) Na^+ is reabsorbed on the needs of the body
- 4) Secretion of H^+ and reabsorption of HCO_3^- take place for the regulation of pH
- 5) Increase the excretion of K^+ by the effect of aldosterone

38) Which of the following is not a hypothesized reason for CKDu in Sri Lanka

- 1) Increase the alkaline nature in urea
- 2) High amount of F^- in drinking water
- 3) Genetic factors
- 4) Malnutrition and dehydration
- 5) Exposure to pesticides

39) The statements regarding hormonal regulation in human reproduction are given below.

- A) Rising levels of FSH and LH secreted by the anterior pituitary direct spermatogenesis.
- B) FSH stimulates production of Testosterone from Leydig cells
- C) Inhibin produced by Sertoli cells decreases secretion of FSH from anterior pituitary

The correct statement / statements from the above is/are

- 1) Only A
- 2) A and B
- 3) A and C
- 4) Only C
- 5) Only B

40) The incorrect statement regarding the sexually transmitted diseases is

- 1) AIDS and syphilis can be transmitted from the mother to baby at birth
- 2) Fallopian tubes become filled with pus and infertile in the case of Gonorrhea
- 3) Persistent dry cough, loss of appetite are symptoms of AIDS
- 4) Due to the action of Herpes virus, painful sores and itchy around genital area
- 5) Syphilis is caused by a virus and sores and ulcers on the body may be symptoms

The instructions for the questions 41 to 50 are given below.

- For each of the questions 41 to 50 one or more of the responses is/are correct Decide which response / responses is/are correct and then select the correct number.

- | | |
|---|---------|
| If only A, B and D are correct | _____ 1 |
| If only A, C, and D are correct | _____ 2 |
| If only A and B are Correct | _____ 3 |
| If only C and D are only correct | _____ 4 |
| If any other response or combination of response is correct | _____ 5 |

Summary of above instructions				
1	2	3	4	5
Only (A) (B) and (D)	Only (A) (C) and (D) correct	Only (A) and (B) correct	Only (C) and (D) correct	Any other response or combination of responses

- 41) Competitive inhibitors
- A) Resemble the nature of the substrate
 - B) Most are reversible inhibitors
 - C) Cause the enzyme molecule to change its shape
 - D) Decline the number of active site available for substrate
 - E) Make the active site less effective for the formation of enzyme substrate complex
- 42) A compound / compounds formed in photosynthesis as well as in cellular respiration is / are
- A) Ribulose biphosphate
 - B) Phosphoenolpyruvate
 - C) oxaloacetate
 - D) Glyceraldehydes – 3 phosphate
 - E) Citrate
- 43) A structure/structures present in phylum Annelida is /are
- A) Coelom
 - B) Suckers
 - C) Ventral nerve cord
 - D) Endoskeleton
 - E) Longitudinal muscles in body wall
- 44) Which of the following statement / statements is/are correct regarding companion cells?
- A) All of them participate in phloem loading
 - B) They are dead at functional maturity
 - C) They are non conduction cells
 - D) They are found alongside in each sieve tube elements
 - E) connects with sieve tube element by numerous desmosomes
- 45) Correct statement/ statements regarding the responses of plants to light is / are
- A) Red light of wave length of 660nm increases percentage of seed germination
 - B) Increasing the proportion of far red : red light stimulates branching of trees
 - C) Crypto chromes involve in shade avoidance
 - D) When cells are exposed to light, auxin stimulates stem elongation in high concentration
 - E) Light induced slowing down of epicotyl elongation during seeding development
- 46) Physical and chemical barrier / barriers in external defense in innate immunity is/are
- A) External barriers found in the skin
 - B) Secretion of various organs
 - C) Interferon
 - D) Mucous membrane
 - E) Natural killer cells

- 47) The correct statement/ statements regarding human embryonic development is/are
- A) Embryo is directly nourished by endometrium in the first 2 – 4 weeks of the embryonic development
 - B) Chorion produces hCG, which is an important hormone of pregnancy
 - C) Initiation of embryonic heart beat takes place after 12 weeks
 - D) By the end of second trimester, the fetus grows to about 60cm in length
 - E) For the pregnancy detection test, presence of estrogen in urine is detected
- 48) The hormone / hormones that participates / participate for the osmoregulation
- A) ADH
 - B) Aldosterone
 - C) Angiotensin II
 - D) Angiotensinogen
 - E) Erythropoietin
- 49) Which of the following is / are not a roles of the liver in homeostasis ?
- A) Carbohydrate metabolism
 - B) Breakdown of erythrocytes
 - C) Production of hormones
 - D) Nucleic acid metabolism
 - E) Production of heat
- 50) A hormone / hormones produced by human gonads is/are
- A) FSH
 - B) LH
 - C) GnRH
 - D) Testosterone
 - E) Progesterone

22 A/L අයි [papers grp]