Royal College – Colombo 07

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) CO_2 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) *Sargassum* – Chrysolaminarin
2) *Ulva* – Floridian starch
3) *Gelidium* – Starch
4) *Diatoms* – oil
5) *Euglena* – 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 homosporus 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 meristamatic 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) Moment 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) Biscxuality 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 infront 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) GHRIH 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 kedney?

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) Ifncrease the excretion of K^+ by the effect of aldesterone

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 Ledig cells
C) Inhibin produced by sertoi 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 bisphosphate
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