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Second Term Test – 2023 A/L (2022-November) Grade 12

Biology I

Time: 2 hours

- This questions paper consists of 50 questions.
- Answer all the questions.
- In each of the questions 1 to 50, pick one of the alternatives (1) , (2) , (3) , (4) , (5)
- Which is correct or most appropriate and mark on the number corresponding to your choice in the answer sheet provided.

(1). Not a criterium, for the wide range of variation in living organisms

1. Shape
2. Size
3. Genetic material
4. Form
5. habitat

(2). What is the property of water to act as a **transportive medium**

1. Solubility
2. Polarity
3. Expansion upon freezing
4. Ability to moderate temperature
5. Cohesive behavior

(3). Select the **correct** statement about organic compounds

1. Amylopectin is a branched non reducing sugar
2. Cholesterol present in the plasma membrane of plant cell membrane ✗
3. Myoglobin is a respiratory pigment, with quaternary structure
4. Complementary base pairing is occurred in some RNA molecules ✗
5. NADP is a reducing agent found in photosynthesis ✗

(4). Which of the following is **correct** about microscope

1. An Compound light microscope resolution power is 0.2 mm ✗
2. The image of eyepiece acts as an object for the objective lens
3. Scanning electron microscope gives 3D view
4. Resolution power of electron microscope is 2 μ m
5. Staining should not be done in light microscope ✓

(5). Which of the following is **correct** about histological background

1. Anton van Leeuwenhook observed and recorded the *Euglena* for first time
2. Theodore Schwann concluded that plant tissues are formed by cells.
3. Rudolf Virchow showed that all cells arise from pre-existing cells by mitosis
4. Robert hook observed cork by using compound microscope
5. 4 scientists are involved for construction of cell theory

(6). Select the **correct** statement about living cells

1. Circular DNA is not present in eukaryotic cells
2. All cells have 70 S ribosomes
3. All eukaryotic cells have nucleus
4. Eukaryotic cells have intracellular flagella with 9+0 microtubule arrangement
5. Eukaryotic cells are 1-10 μm in diameter

(7). Select the **correct** statement subcellular components

1. Lipid metabolism is done by RER
2. Peroxisomes are involved digestion of worn out organelles
3. Micro filaments in cytoskeleton are made up of keratin
4. Centrioles produce aster and spindle
5. Tight junctions are present between muscle tissue

(8). **Correct** about cell division

1. M phase consists of 20 % of the cell cycle
2. Sister chromatids are attached by cohesion proteins in anaphase
3. Middle plate is formed during the cytokinesis in plant cell
4. Meiosis can be observed by the T.S of *Rhoeo* anther
5. Cell cycle regulatory signals are considered by cancer cells also

(9). Which of the following are **correct**

- a) Enzyme has regulatory site where enzymatic reaction occurs
- b) ATP is a dinucleotide
- c) Organic co factors are co enzymes
- d) Most enzyme have 6-8 pH range
- e) ADP is an allosteric inhibitor

1. a, b and d
2. a, c and d
3. a and d
4. c and d
5. a, c and e

(10). Which of the following is **not** abundantly found in early atmosphere

1. Water vapour
2. Hydrogen
3. Oxides of nitrogen
4. Oxygen
5. Carbon dioxide

(11). Select the **incorrect** statement about protocell

1. Vesicle surrounded by lipids
2. Show replication and irritability
3. RNA found as genetic material
4. By collision of vesicles protocell growth is occurred
5. Protocell has RNA catalyzed reactions

(12). Select the **incorrect** statement about diversification of eukaryotes

1. Most present day animal phyla originated in Paleozoic cons
2. Sponges are evolved in 700 million years ago
3. Colonization of animals to land happens in 500 million years ago
4. Divergence of human lineage from other primates happens 40 million years ago
5. First tetrapods are evolved by lobed finned fish

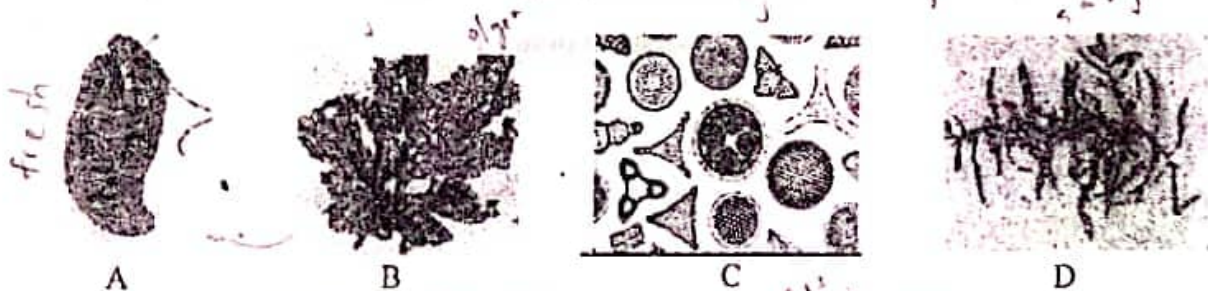
(13). **Incorrect** statement about theories of evolution

1. Acquired characters are inherited to the progeny described in Lamarck theory ✓
2. In use-disuse concept, If body parts are not used, they become deteriorate ✓
3. Organism acquired adaptation during their life time according to the needs in Darwin theory ✗
4. Defense for diseases undergoes natural selection from generation to generation
5. Neo-Darwinism generally denotes the integration of Charles Darwin's theory of natural selection, Mendelian genetics

(14). Unique feature of domain-**Archaea**

1. Can grow over 100°C
2. Methionine is the initiator amino acid in protein synthesis
3. Cell wall contain peptidoglycan
4. Cell growth is not inhibited by Antibiotic ✗
5. Several RNA polymerase present

❖ 15-16 questions are based on following organisms in Protista



(15). Organisms **exclusively** marine

1. A and B
2. B and C
3. Only C
4. C and D
5. B and D

(16). Organisms **with** cell wall

1. Only B
2. B, C and D
3. B and D
4. A, B and D
5. Only D

(17). Select the **correct** statement about seedless vascular plants

1. Only phloem has lignified cells ✗
2. shoot tissues of living plants resemble stem tissues of the early vascular plants ✗
3. microphylls and macrophylls with branched vascular tissues ✗
4. most species have one type of sporangia ✗
5. macrophylls bear megasporangia

✓ (18). Not true about seed plants

- ① Always sperms are transport via pollen tube
2. Presence of microscopic gametophyte ✓
3. Retaining the megasporangium within the parent sporophyte ✓
4. Endosperm is surrounded by a protective coat which is known as seed coat ✓
5. Tiny gametophytes develop from spores is retained within the sporangia ✓

❖ 19-20 questions are based on following organisms



A



B



C



D

(19). Which of the above organisms have **nephridia**

1. Only B
2. Only B and C
3. Only C and D
4. A, B and C
5. Only D

(20). Which of the above organisms show **segmentation**

1. A and B
2. B, C and D
3. B and D
4. B
5. C and D

(21). What is the **correct** statement about lateral meristems of woody plants

1. Found in root apex and shoot apex ✗
2. Increase the circumference of stem and root ✓
3. Rapid regrowth of leaves occurred ✗
4. Responsible for primary and secondary growth ✗
5. Found in the base of stem and leaves ✗

(22). Select the **incorrect** statement plant tissue systems and its functions

1. Dermal tissue-hair like trichomes reduce water loss ✗
2. Ground tissue-short distance transport by parenchyma cells ✓
3. Vascular tissue-involved for loading and unloading the phloem ✓
4. Dermal tissue-synthesis of various organic products ✗
5. Ground tissues-trichomes secrete chemicals involved in defense against insects ✓

(23). Select the **correct** physiological feature of endodermis

1. Single cell layer ✓
2. Suberized transverse and radial walls ✓
3. Having extracellular spaces ✗
4. keep unneeded and toxic materials out of the vascular tissue ✓
5. having casparian strip ✓

(24). Not a similar feature of pericycle in monocot and dicot roots

- A. Found inside the endodermis ✓
- B. Formed by 2 or 3 layers of parenchyma ✓
- C. Forms the cork cambium ✓
- D. Involved for the secondary growth ✗

- 1. A, B
- 2. A, C
- 3. A, D
- 4. C, D
- 5. B, C

(25). Incorrect about vascular rays in secondary growth,

- 1. They are parenchyma cells
- 2. Formed by short initials
- 3. Formed by initials which are found parallel to the axis of stem or root
- 4. Connect the xylem and phloem ✓
- 5. store carbohydrates

(26). Select the correct comparison about spring wood and summer food

- | Spring wood | Summer food |
|----------------------------------|---|
| 1. Small lumen in xylem vessels | large lumens in xylem vessels |
| 2. Do not transport much water | maximizes delivery of water to new leaves |
| 3. xylem vessels with thin walls | xylem vessels with thick walls ✓ |
| 4. dark coloured growth ring | light coloured growth ring ✓ |
| 5. provide more support | provide less support |

(27). Select the functional difference between heart wood and sap wood

	Heart wood	Sap wood
A	they are close to the centre of the stem or root.	newest outer layers of secondary xylem ✓
B	Dark colour	Light colour
C	resins and other compounds that permeate the cell cavities	No resins ✓
D	no longer transport water and minerals.	still transport xylem sap ✓

- 1. Only A and B
- 2. Only A and C
- 3. Only A
- 4. Only C
- 5. Only D

(28). Not an adaptation for the regulation of stomatal pore size

- 1. Chloroplast ✓
- 2. Unevenly thickened cellulose cell walls in guard cells ✓
- 3. More elastic inner walls of guard cells ✓
- 4. Arrange cellulose microfibrils radially around the guard cells ✓
- 5. All are incorrect

(29). Select the **correct** answer about stomata and lenticels

	Stomata	Lenticels
A	Found in primary tissues	Horizontal slits of periderm ✓
B	Formed during primary growth	Formed during secondary growth ✓
C	Size of the stomatal pore can be controlled	Size of the pore cannot be controlled ✓

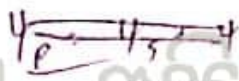
1. Only A
2. Only B
3. Only C
4. Only A and B
5. A, B and C

(30). Which of the following is **incorrect** about water and mineral transport

1. Diffusion can be happened via membranes ✓
2. Osmosis happens via selectively permeable, passing water molecules that are bound to solutes ✓
3. physical adsorption of water molecules by hydrophilic materials is called imbibition. ✓
4. Movement of hydrophilic solutes across the membranes with the help of transport protein can be happens ✓
5. Bulk flow does not occur through the membranes ✗ ✓

(31). What is the **pressure potential** of tissue at equilibrium, if it is immersed in a solution with solute potential -1500 KPa, consider that less amount of cells of the tissue become flaccid in equilibrium. Solute potential of tissue is -1750 KPa

1. 3250 KPa
2. 1500 KPa
3. 1750 KPa
4. -250 KPa
5. 250 KPa



(32). Select the **incorrect** statement about radial water transport

1. Water and solutes move along continuum of the cell walls and extracellular spaces is known as apoplastic route ✗ ✓
2. Endodermis blocks apoplastic route ✓
3. Only some types of living cells are included into symplast ✓
4. The transmembrane route requires repeated crossing of plasma membranes ✓
5. The least resistance for the transport is found in apoplastic route ✓

✗ (33). Select the **correct** order of the steps of pressure flow hypothesis

- a) The sieve tube takes up water from the xylem by osmosis
 - b) unloading of sugar at the sink
 - c) uptake of water generates a positive pressure that forces the sap to flow along the tube
 - d) Loading of sugar into the sieve tube reduces water potential inside the sieve tube elements at the source
1. a, b, c, d
 2. c, a, b, d
 3. b, c, a, d
 4. d, c, b, a
 5. d, a, c, b

(34). Which of the following is **incorrect** about transpiration and guttation

	transpiration	guttation
1	Remove as water vapour ✓	Remove as droplets ↓
2	Occur via stomata, lenticels and cuticle ✓	Occurs via hydathodes ↓
3	Lowers with high humidity ✓	Occurs with the 80% humidity ✓
4	Occurs according to diffusion gradient ✓	Occurs due to root pressure ✓
5	Happens in all plants ✓	Only in some non woody plants ↓

(35). Select the **correct** elements important for nitrogen metabolism

1. Mo, Cu
2. Fe, Zn
3. B, Ni
4. Mo, Ni
5. Mn, Ni

(36). The **correct** relationship between epithelial tissue and its location

1. Simple squamous-kidney tubules ✓
2. Simple cuboidal -thyroid gland ✓
3. pseudostratified columnar-outer skin ✓
4. simple columnar-nasal passage ✓
5. stratified squamous-intestinal lining ✓

(37). Select the **correct** reasons to consider blood as a special connective tissue

- a) Matrix is not secreted by cells
- b) Fibers are present only during clotting process ✓
- c) Liquid matrix
- d) Provide defense and transportive function ✓

1. Only a
2. Only a and b
3. Only a, b and d
4. All a, b, c and d
5. only a and c

(38). Select the **correct** answer with the function of neuroglia, mast cells, chondrocytes respectively

1. Insulation of neurons, phagocytosis, heat insulation
2. Transmission of impulses, secretion of histamine, protection
3. Provide strength, flexibility, contractility
4. Provide nourishment to neurons, secrete heparin, secrete collagen fibers
5. Absorption, secretion of histamine, secrete collagen fibers

(39). Select the **correct** structural adaptations of small intestine for efficient absorption

- a) Permanent circular folds
- b) Presence of villi
- c) Presence of microvilli
- d) Secretion of cholecystokinin and secretin

1. Only a 2. Only a and b 3. only a, b and c 4. Only a, c and d 5. Only a and d

7 (40). Select the vitamins responsible for creating **anemia** with their deficiency

1. Niacin, folic acid, thiamine
2. Pyridoxin, biotin, Bs
3. Ascorbic acid, niacin, riboflavin
4. Cobalamin, biotin, thiamine
5. Pyridoxin, folic acid, cobalamin

The responses for questions 41 to 50 should be chosen as follows. One or more responses could be correct.

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 correct	-	4
If any other response or combination of responses is correct	-	5

1	2	3	4	5
A, B and D are correct	A, C and D are correct	A and B are correct	C and D are correct	any other response or combination of responses is correct

(41). Which of the following/s is/are **correct** about photosynthesis

- A. There is a pair of chlorophyll a molecules as P_{700} in the primary electron acceptor ✓
- B. G3P is reduced to form 3PGA during Calvin cycle (✓)
- C. First stable carbohydrate is a 3C compound in C_4 plants
- D. Aquatic plant is used for the practical that determines rate of photosynthesis
- E. Light intensity is the major limiting factor for photosynthesis under normal conditions ✓

(42). Which of the following/s is/are **correct** about cellular respiration

- A. Glycolysis happens in the cytosol of prokaryotic and eukaryotic cells ✓
- B. 6 NADH are formed for one glucose by Krebs cycle ✗ 3
- C. 28 ATP molecules are formed by reductive phosphorylation
- D. Always CO_2 is formed during fermentation ✗
- E. RQ value is 0.7 for proteins

(43). Which of the following/s is/are **correct** about fungi

- A. Ascospores are formed by meiosis and conidia are formed by mitosis
- B. Basidiospores are exogenous ✓
- C. Always *Mucor* mycelium is aseptate ✓
- D. Genetically diverse haploid spores are formed by zygosporangium ✗
- E. Asexual reproductive structures are abundantly can be seen in Basidiomycota ✓

(44). Which of the following/s is/are **correct** about Platyhelminthes

- A. Free living organisms have cilia for locomotion ✓
- B. Gas exchange is happened via body surface ✓
- C. No transportive and excretory systems ✗ ✗
- D. Free living organisms have larval stages
- E. Complete digestive system present ✗

(45). Which of the followings are **correct** about Chordata

- A. Most of Chondrichthyes do external fertilization ✗
- B. Most amphibia have lungs for respiration ✓
- C. *Ichthyophis* lay eggs without shells ✗
- D. Only Mammalia is endothermic ✗
- E. Mammalia has cartilaginous articulatory surfaces in their endoskeleton

(46). Which of the following/s is/are similarities between *Pogonatum* and *Nephrolepis* life cycles

- A. Independent gametophytes ✓
- B. Photosynthetic gametophytes ✓
- C. Formation of prothallus
- D. Heteromorphic alternation of 2 generations
- E. Dominant sporophyte ✓

(47). Select the correct statement/s about parthenogenesis in plants

- A. Development of seed without fertilization
- B. Seeds have embryo ✓
- C. Diploid egg cell is resulted from mitosis ✓
- D. Fusion of haploid egg cell with polar nucleus
- E. Diploid ovum is resulted from duplication of genetic materials

(48). Which of the following/s is/are correct about cold stress

- A. Change the lipid composition of cell membrane ✓
- B. Increases the unsaturated fatty acid amount in the cell membrane ✓
- C. Maintain low solute concentration in the cytosol of cells
- D. Decreases the concentration of sugar like compounds in the cell
- E. Due to cold stress transport of materials via the membrane happens quickly ✓

(49). Select the correct compound/s related to the pre-existing chemical defense

- A. Alkaloids, terpenoids
- B. Phytochrome, phenolic
- C. Azadirachtin, Flavonoids,
- D. Nicotine, lectin ✓
- E. Caffeine, Nicotine

(50). Select the correct statement/s about double circulation

- A. In a complete circulation through the entire body, blood passes through the heart twice
- B. consists of separate pulmonary and systemic circuits ✓
- C. heart pumps blood into the systemic circulation with high pressure ✓
- D. no distinction between the circulatory fluid and the interstitial fluid ✓
- E. found in Arthropoda, Mollusca and amphibia

Second Term Test – 2023 A/L (2022-November)

Biology II

Grade 12

Part-B- Essay

❖ Answer 4 questions only

5. a) Describe the effect of temperature on the rate of enzymatic reaction
- ✓ b) Describe the effect of allosteric activator and allosteric inhibitor for the enzymatic reaction
6. Describe the experiment to determine the respiratory rate and respiratory quotient by using germinating seeds
7. Describe the pathways of water transportation from soil solution to xylem of root
- ✓ 8. Describe the life cycle of seedless vascular plants with heterosporous condition
adiantum selaginella
9. Describe the modes of nutrition found among animals
→ feeding mecha
→ symbiosis
→ holozoic
10. Write short notes on,
 - a) Echinodermata
 - b) K^+ influx mechanism
 - c) Functions of proteins of plasma membrane

★★★

*Lycopodium
Pterophyta*



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