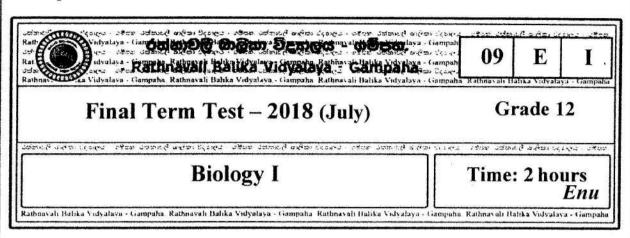
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This questions paper consists of 50 questions

- 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) Select the correct statement
 - 1. C, H, O and N make up 96.6 % of living matter
 - 2. H bonds are breaking in liquid water with low frequency
 - 3. Water has high surface tension due to cohesive forces
 - 4. Water at 15 °C has more density than the water at 10° C
 - 5. Solubility of water depends on polarity and ionic nature
- 2) A branched polysaccharide which is formed by polymerization of pentose
 - 1. Hemicellulose
 - 2. Amylose
 - 3. Glycogen
 - 4. Pectin
 - 5. Chitin
- 3) Select the incorrect statement about carbohydrate
 - 1. Fructose is a ketose
 - 2. A rare carbohydrate in nature has 4 carbon atoms
 - 3. Glycogen is the stored food in fungi
 - 4. Hemicellulose is a component of middle lamella of plant cell wall
 - 5. Glucosamine has Nitrogen
- 4) Select the incorrect statement about lipids
 - 1. Saturated fat and trans unsaturated fat contribute atherosclerosis
 - 2. Choline is a hydrophobic molecule
 - 3. Animal fat usually have no double bonds between carbon atoms
 - 4. Cholesterol maintains the fluidity of plasma membrane
 - 5. According to the nature of carbon double bonds, fatty acids can be divided as trans and cis types

- 5) Select the correct answer with proteins that do following functions respectively
 - Transport fátty acids -
 - Prevent desiccation
 - Storage protein in milk
 - 1. Serum albumin, Chitin, Caseinogen
 - 2. Serum albumin, Keratin, Caseinogen
 - 3. Ovalbumin, Keratin, Casein
 - 4. Serum albumin, Keratin, Casein
 - 5. Myosin, Cutin, Casein
- 6) Not a basic feature common to all cells
 - 1. All cells are bounded by a plasma membrane
 - 2. Within the cell, there is a semifluid cytosol
 - 3. Ribosomes are found in all cells
 - 4. All cells carry genetic material
 - 5. All cells have vacuoles
- 7) Not a function of protein of plasma membrane
 - 1. Involved in cell identification
 - 2. They allow for the passing of some ions
 - 3. Act as receptors for steroid hormone and allow them to enter the cell
 - 4. Act as enzymes
 - 5. Help to maintain the shape of the cell
- 8) Not found in mitochondrial matrix
 - 1. Lipid droplets
 - 2. 70 S ribosomes
 - 3. Circular DNA
 - 4. Phosphate granules
 - 5. Enzymes
- 9) Select the correct statement about cell cycle
 - 1. Most cells in the human body are in the G₀ phase
 - 2. Two genetically identical daughter cells are formed during mitosis
 - 3. Chromosomes can be observed by light microscope at G₃ phase
 - 4. The division of cytoplasm starts at cytokinesis
 - 5. This is important to maintain constant chromosomal number from generation to generation
- 10) Select the correct statement about enzymes.
 - 1. The active site is formed by many amino acids
 - 2. Loosely bound cofactors are always reversible
 - 3. Biotin is an inorganic co-factors
 - 4. In most enzymes optimum pH range is 5-7
 - 5. Drugs used against microbes, bind with enzymes via weak interactions

11) Select the incorrect statement about cellular respiration

- 6 ATP molecules are formed in aerobic respiration of glucose by substrate phosphorylation
- 2. The electron transport chain in the inner membrane of mitochondrion has protein and non-protein molecules
- 3. Not all cells produce 32 ATP molecules by cellular respiration
- 4. Intermediate molecules are joined only with the glycolysis and oxidation of pyruvate, when proteins are used in respiration
- 5. Final H acceptor is an organic molecule in both types of anaerobic respiration

12) Not a difference of cyclic electron transport from linear electron ransport

- 1 Only photosystem I is used
- 2. No formation of NADPH
- 3. No releasing of oxygen
- 4. Excitation of photosynthetic pigments of reaction center complex of photosystem I
- 5. No activation of cytochrome complex

13) Which of the following statement is incorrect about diversification of organisms

- 1. Many present-day animal phyla appeared in the early Cambrian period
- 2. The divergence of human lineage was initiated 6-7 million years ago
- 3. Origin of first animal group is happened at Eon Phanerozoic
- 4. Colonization of land by animals began after about 500 million years ago
- 5. Oldest multicellular eukaryotes were originated about 1.2 billion years ago.

14) Which of the following is correct about the classification

- Linnaeus classified plants into a hierarchical order of taxa, classification level such as;
 Species, genus, order, class, and phylum
- 2. Classification of Robert H Whittaker was based on nature of respiration of organisms
- 3. Aristotle classified organisms according to their nutritional mode
- 4. Theophrastus classified plants according to lifespan
- 5. Bacteria and Archea are mostly related to each other than Eukarya

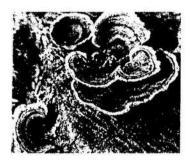
15) Select the incorrect statement about Salmonella typhi

- 1. Introns in gene are very rare
- 2. Presence of several kinds of RNA polymerases
- 3. Cell wall composition has peptidoglycan
- 4. Membrane lipids have Unbranched hydrocarbons
- 5. No growth at over 100 0 C

16) Select the incorrect relationship

	Organism	Character		
1	Amoeba	Living aquatic organism		
2	Diatoms	Unicellular		
3	Gelidium	Air filled bulb like structures are found		
4	Ulva	Has hold fast		
5	Sargassum	Has stem like stipe and leaf like blade		

17) Select the correct statement about the following fungus



- 1. Exogenous basidiospores are produced
- 2. Form zygosporangium in unfavorable environmental conditions
- 3. Septa are found only at gametangia
- 4. Form structures with 8 spores
- 5. There is no Dikaryotic stage in the life cycle

18) Not a character of meristematic cell

- 1. Isodiametric shape
- 2. Having central large vacuole
- 3. Presence of large nucleus
- 4. Having only primary cell wall
- 5. Functionally undifferentiated

19) Select the responsible meristem, for the regrowth of damaged leaves of grasses due to grazing

- 1. Apical meristem
- 2. Intercalary meristem
- 3. Cork cambium
- 4. Vascular cambium
- 5. Lateral meristem

20) Select the **correct** statement

- 1. In the zone of cell elongation, root cells elongate, to more than ten times their original length
- 2. Cells produced inward to the apical meristem are differentiated to form root cap
- 3. There are parenchyma cells in the zone of cell elongation
- 4. In the zone of maturation, functionally non matured cells are present
- 5. Leaf primordia develop from leaves

- 21) Select the incorrect statement about the plant tissue systems
 - 1. Short distance transport is a function of ground tissues
 - 2. Epidermis of mature parts of the plant can be replaced by pericycle
 - 3. Collenchyma provides support without restraining growth
 - 4. Vessel elements have thinner walls than tracheids
 - 5. In gymnosperms, organic food is transported via sieve cells

22) Select the correct relationship

- 1. Cortex of dicot stem
- provide additional strength by sclerenchyma
- 2. Cortex of dicot root
- selective absorption of minerals
- 3. Cortex of dicot stem
- formation of vascular cambium
- 4. Epidermis of dicot root
- provide protection by cuticle
- 5. Bundle sheath cells surrounding the vascular bundle of monocot stem carry out dark reaction of photosynthesis
- 23) Not an adaptation of plant to capture maximum light
 - 1. Increasing the height of plant
 - 2. Having well branched stem
 - 3. Having small leaves
 - 4. Presence of horizontally oriented leaves
 - 5. Arrangement of one leaf per node, on the stem
- 24) Select the incorrect statement about the guard cells of flowering plants
 - 1. Inner wall is thicker than outer wall
 - 2. They are parenchyma cells with chloroplasts
 - 3. Two guard cells are tightly attached with each other, at two ends
 - 4. Having vertically arranged cellulose microfibrils
 - 5. Bean seed shaped
- 25) Not a factor that is responsible for the opening of stomata
 - 1. Entering of water into guard cell
 - 2. Decrease in CO₂ concentration in the substomatal cavity
 - 3. Light intensity
 - 4. High wind
 - 5. Absence of ABA
- 26) Select the correct statement about the water potential of a cell
 - 1. Water potential of a full turgid cell is similar with the solute potential
 - 2. Only endosmosis is happened when a cell, is placed in pure water
 - 3. Water potential of a cell at incipient plasmolysis is similar to the solute potential
 - 4. Fully turgid cells are found in nature
 - 5. There is no exosmosis, happens in a cell at dynamic equilibrium with a solution

27) Not a result of transpiration

- 1. Ascent of xylem sap
- 2. Uptake of water and minerals by roots from the soil solution
- 3. Increasing the humidity in the atmosphere surrounding the plant
- 4. Get a cooling condition to plant leaves
- 5. Bulk flow of organic food in the phloem

28) A commensalism relationship in plants

- 1. Cuscuta and host plant
- 2. epiphytes
- 3. Anabaena and Cycas root
- 4. Loranthus and Mango tree
- 5. Fungi and higher plant root

29) Which of following minerals create chlorosis, with their deficiency

- a.) Nitrogen
- b.) Magnesium
- c.) Potassium
- d.) Zinc
- e.) Sulfur
- 1. Only a and b
- 2. Only b and d
- 3. Only a, b and d

- 4 Only a, b and e
- 5. Only a, c and e

30) Select the incorrect statement/s about the plant life cycles

- a.) Prothallus is formed by the development of spores in *Pogonatum*
- b.) Nephrolepis has rhizoids
- c.) There is only one megasporangium, near to the each megasporophyll in Selaginella
- d.) Functional megaspore of Cycas is dispersed by wind
- e.) Stamens of flowering plants represent the microsporophylls
- 1. Only a and b
- 2. Only a and d
- 3. Only a, b and d

- 4. Only a, b, c and d
- 5. Only a

31) A reason for the seed dormancy

- 1. Synthesis of Gibberellin in the embryo
- 2. Presence of seed coat
- 3. Presence of immature embryo
- 4. Presence of endosperm, to provide nutrition to embryo
- 5. Presence of 2 Cotyledons

- 32.) Which of the following plant growth substance is responsible for the growth of pollen tube
 - 1. Auxin
 - 2. Gibberellin
 - 3. Cytokinins
 - 4. Ethylene
 - 5. Jasmonic acid
- 33) which of the following is correct plant's responses for stress conditions
 - 1. All monocot plants roll their leaves in drought conditions
 - 2. Amount of unsaturated fatty acid is increased in plasma membrane, during winter season
 - 3. All mangroves have salt glands
 - 4. Presence of epidermal hairs, is an induced defense mechanism of plants
 - 5. Cyanogenic glucoside is a primary metabolic product of plants
- 34) Not a response of blue light photoreceptors in plants
 - 1. Light induced opening of stomata
 - 2. Slowing of hypocotyl elongation, during the seedling breaks ground
 - 3. Phototropism
 - 4. Opening of stomata, due to decreasing of CO2 concentration
 - 5. The growth of a shoot towards the light
- 35) Which of the following is not affected by light
 - 1. Seed germination
 - 2. Plant spacing
 - 3. Flowering
 - 4. Elongation of shoot
 - 5. Formation of root hairs
- 36) Select the correct statement about epithelial tissues in man
 - 1. Basal surface of all cells are rest on the basement membrane
 - 2. The walls of all glands in man are made up of simple cuboidal epithelium
 - 3. Pseudostratified columnar epithelium is an compound epithelium
 - 4. Some cells are modified to secrete hormones
 - 5 Epithelial cells are arranged loosely
- 37) Select the correct relationship/s
 - a) Areolar tissue
- holds organs in place
- b) Fibrous connective tissue
- form tendons

c) Bones

- provides support and flexibility
- d) Smooth muscles
- constriction of arteries

e) Neurons

- provide support to neuroglia
- 1. Only a and b
- 2. Only a, b and c
- 3. Only a, b, c and d

- 4 Only a, b and d
- 5. Only a, b and e

38) which of the following answer has a substance, that is not found in saliva

- 1. Water, Amylase, Minerals
- 2. Water, Amylase, Lipase
- 3. Mucus, Buffers, Antimicrobial substances
- 4. Water, Buffers, Immunoglobulin
- 5. Water, Amylase, lysozyme

39) Not a location, that forms plant meristem

- 1. Leaf of dicot plant
- 2. Leaf in grasses
- 3. Root tip
- 4. Outer cortex of dicot stem
- 5. Pericycle of dicot root

40) Select the correct statement/s

- a) Long, multinucleated cells found in the skeletal muscle tissue
- b) Intercalated disc are found only in cardiac tissues
- c) Smooth muscle cells are striated
- d) Cardiac muscle cells are striated
- e) Skeletal muscles control the involuntary actions
- 1. Only a and d
- 2. Only a and e
- 3. Only a, b and d

- 4. Only a, b, c and d
- 5. Only a, c and d
- 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	2	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) Select the correct statement/s about Fungi

- A. Diploid condition in Mucor can be observed only in zygosporangium
- B. Chytridium, Aspergillus and Puff balls have septate mycelia
- C. The abundant mould that is formed on bread, has flagellated spores
- D. Septa enable the movement of mitochondria, in septate fungi
- E. Ascomycota can be only found in fresh water and terrestrial environment

42) Select the correct statement/s about microscopes

- A. Resolution power is a measure of the clarity of the image.
- B. Usually the maximum magnification of light microscope is 10000 times
- C. The resolution power is increasing with the decreasing of wave length
- D. Electron microscope magnifies the objects up to 1×108 times
- E. During staining, heavy metals are attached more to certain cellular structures

43) Select the **correct** statement/s about C₄ photosynthesis

- A. CO₂ is converted into HCO₃⁻
- B. Malate or aspertate diffuse to the bundle sheath cells
- C. Mesophyll cells have low amount of chloroplasts
- D. Photosystem II can be found abundantly in bundle sheath cells
- E. PEP reacts with CO₂

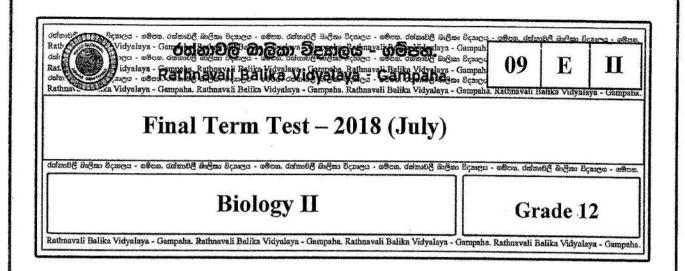
44) Select the **correct** statement/s about enzymes

- A. Binding of an one molecule of O₂ to one binding site of hemoglobin, decreases the affinity for O₂ of the remaining binding sites
- B. Drugs used against microbes are reversible inhibitors
- C. Trypsin has optimum activity at pH 2
- D. Derivatives of vitamins can be act as co-enzymes.
- E. Rate of reaction is always increased with the concentration of substrate, when environmental conditions are favorable

45) Select the incorrect statement/s about plasma membrane

- A. Plasma membrane of plant cells has cholesterol
- B. The two sides of the membrane may differ in composition and function
- C. Peripheral proteins are tightly attached to the inner surface of the membrane
- D. Most integral proteins are transmembrane proteins
- E. Cholesterol prevents, membrane solidification at low temperatures

- 46) Select the animl/s, without clear cephalization, and having sensory organs
 - A. Fasciola B. Taenia
- C. Planaria
- D. Round worm E. Rag worm
- 47) Which of the following statement/s is/are correct about plants
 - A. More root hairs are found far to the root tip area
 - B. K* concentration in the root hair cells is ten of times greater than in the soil solution
 - C. Adsorption of water molecules by the hydrophilic cell walls from soil solution is imbibition
 - D. Endodermis prevents solutes that have accumulated in the xylem from leaking back into the soil solution.
 - E. Radial water transportation on plants is always start by apoplast
- 48) Which of the followings is/ are correct
 - A. Most of the bacteria and fungi are heterotrophs
 - B. Holozoic nutrition has main 4 steps
 - C. Filter feeders are only aquatic organisms
 - D. Substrate feeders are found inside the food
 - E. Symbiosis is an one type of commensalism
- 49) Which of the followings is/are incorrect
 - A. Alveoli cells of pancreas secrete digestive enzymes
 - B. Liver is the largest gland of human body
 - C. Hepatic duct is connected with pancreatic duct
 - D. Trypsin is secreted from pancreas
 - E. Blood sinusoids of liver has Kupffer cells
- 50) Which of the following gland/s release their secretions into the alimentary canal by a duct
 - A. Liver
 - B. Islets of Langerhans
 - C. Pancreas
 - D. Gall bladder
 - E. Sweat gland



Part B - Essay

Answer 4 questions only

- (5) a. Water is a vital inorganic molecule for the existence of life on this planet. Mention the 2 reasons for that
 - b. Describe the major properties of water that are important to maintain life on earth
- (6) a. Describe the xylem tissue of Gnetum
 - b. Describe the translocation of photosynthetic products, from leaf of mango plant to a fruit
- (7) a. Define animal tissue
 - b. Describe different types of epithelial tissues with reference their structure, locations and functions
 - c. Draw the main types of muscle tissues then compare the structural and physiological characters of them
- (8) a. Define alternation of generations
 - Mention an example for Bryophyta and Pterophyta, then describe their life cycles comparatively
- (9) Mention 2 accessory glands in the abdominal cavity, and describe their structure and functions
 - (10) Write short notes on,
 - a. Galls of plants
 - b. Radial transportation of water and minerals in plants
 - c. Significance of C₄ photosynthesis