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தென் மாகாணக் கல்வித் திணைக்களம்
Southern Provincial Department of Education

අධ්‍යාපන පොදු සහතික පත්‍ර (උසස් පෙළ), 13 ශ්‍රේණිය, පළමු වාර පරීක්ෂණය, 2019 නොවැම්බර්
General Certificate of Education (Adv. Level), Grade 13, First Term Test, November 2019

ජීව විද්‍යාව I
Biology I

09 E I

පැය දෙකයි
Two hours

Instructions:

- Answer **all** questions.
- Write your **index number** in the space provided in the answer sheet.
- Instructions are given on the back of the answer sheet. Follow those carefully.
- In each of the questions **01 to 50**, pick one of the alternatives from (1), (2), (3), (4), (5) which is **correct or most appropriate** and **mark your response on the answer sheet with a cross (×)** on the number of the correct option in accordance with the instructions given on the back of the answer sheet.

01. What is the **correct** statement regarding the elemental composition of matter?

- (1) Carbon forms the highest percentage of the weight of a living body.
- (2) 96.3% of human body mass is formed by C, H, O, N, S and P.
- (3) Na is an essential micro element for plants.
- (4) 20- 25% of elements naturally found in earth crust are essential for organisms.
- (5) The component elements of haemoglobin are C, H, O and Fe only.

02. What is the **correct** statement regarding carbohydrates?

- (1) RuBP is a derivative of ribose.
- (2) Glucose, sucrose like carbohydrates convert to ring form in aqueous medium.
- (3) Fungal cell wall contains glucose amine.
- (4) Starch present as crystalline form.
- (5) Caesin is the storage carbohydrate found in milk.

03. Which of the following is the **correct** combination of structure – function relationships regarding extra – cellular components?

- (1) Primary cell wall – selective absorption of water and minerals.
- (2) Secondary cell wall – Maintenance of permeability of the cell.
- (3) Desmosomes – Allow transporting of ions, sugars and amino acids.
- (4) Extra Cellular Matrix - Joins with the cytoskeleton.
- (5) Communicating junctions – Involves in exchanging signals in smooth muscle cells.

04. Below given are few functions of each of the components of cytoskeleton.

- (a) Microtubules – Form pseudopods.
- (b) Micro filaments – Form cleavage furrow in animal cells.
- (c) Intermediate filaments – Anchorage of nucleus like organelles

The **correct** statements from above are,

- (1) a and b only
- (2) b and c only
- (3) a only
- (4) c only
- (5) All of the above.

05. Which one of the following is the **correct** statement regarding cellular respiration?

- (1) NADH molecule is produced from one glucose molecule in glycolysis.
- (2) Lactic acid is formed by oxidation of pyruvate, when CO_2 is present in animal cells.
- (3) 3 NADH molecules, 1 $FADH_2$ molecule and 2 ATP molecules are produced by one Acetyl group in Citric acid cycle.
- (4) 2 CO_2 molecules and 2 NADH molecules are produced in pyruvate oxidation by one glucose molecule in cellular respiration.
- (5) 3 CO_2 molecules are produced during complete oxidation of Acetyl Co. A in Kreb's cycle.

06. Which one of the following is **correct** regarding enzymes?

- (1) Enzymes do not act outside the living cells.
- (2) The drugs used against microorganisms are irreversible inhibitors.
- (3) End products formed by enzymatic reaction act as inhibitors and stop the reaction.
- (4) Co-factors are essential for the activity of all enzymes.
- (5) Equilibrium of the reaction is changed by the enzymes.

07. Which one of the following is the **incorrect** statement regarding light reaction of photosynthesis?

- (1) This process occurs on thylakoid membranes.
- (2) Photolysis of water occurs associated with photosystem II.
- (3) The chlorophyll molecule in the reaction centre of photosystem I is P_{700} and the chlorophyll molecule in the reaction centre of photosystem II is P_{680}
- (4) Blue and red light of visual spectrum are more important for this.
- (5) Cyclic electron flow occurs associated with photosystem II.

08. Which one of the following is **not** a reason for higher yield in C_4 mechanism, when comparing C_4 and C_3 photosynthesis?
- (1) There is no affinity between PEP and Oxygen.
 - (2) Bundle sheath cells of C_4 plant leaves are highly adapted for its physiological function.
 - (3) RUBISCO enzyme acts in leaf mesophyll cells under high CO_2 concentration.
 - (4) Presence of large number of plasmodesmata between leaf mesophyll cells and bundle sheath cells.
 - (5) Presence of low O_2 percentage in bundle sheath cells.
09. Select the **correct** statement according to the Theory of Lamarck.
- (1) Favourable variations cause for increasing beneficial traits in a population from generation to generation.
 - (2) There is a genetic diversity among members of a population.
 - (3) Produce more offsprings than their environment could accommodate.
 - (4) Produce large number of offsprings with suitable traits.
 - (5) Adaptations acquired during life time of organisms transmit to their offsprings.
10. Which one of the following is **correct** regarding modern classification?
- (1) The common characters gradually decreases in organisms from Domain to Species.
 - (2) Consider the base sequence of t-RNA also.
 - (3) Domain Archea is more related to Domain Bacteria.
 - (4) This is based on the rapid advance of molecular biology and the new information on the evolutionary relationships of organisms.
 - (5) All organisms are classified into three Kingdoms.
11. Which one of the following is a characteristic feature in Domain – Bacteria?
- (1) Most of them are found in size between 0.1 – 5 micro meters.
 - (2) Some of them are classified as Gram (+) and Gram (-) , according to the amount of peptidoglycan in the cell wall.
 - (3) Though, flagella are covered by plasma membrane; 9+2 structure of microtubules are absent.
 - (4) All organisms perform conjugation as sexual reproduction.
 - (5) Cell walls are surrounded by a sticky protein.

12. Select the answer which shows **correct** order of organisms of Kingdom Protista who possess following features, respectively.

- (a) Presence of gas filled bulb shaped floats which are multicellular.
- (b) Presence of an oral groove
- (c) Presence of a thalloid body with hold fast

(1) *Sargassum, Paramecium, Gelidium*

(2) *Sargassum, Euglena, Ulva*

(3) *Gelidium, Paramecium, Sargassum*

(4) *Ulva, Euglena, Paramecium*

(5) *Gelidium, Paramecium, Ulva*

13. Select the **incorrect** statement regarding the characteristic feature relevant for the phylum of each of the following plants.

- (1) *Pinus* – Produce two types of spores in separate cones.
- (2) *Cycas* – Bear flagellated sperms similar to seedless vascular plants.
- (3) *Cyperus* – Bear leaves which are similar to the leaves of Palmae family.
- (4) *Oryza* – Ovary becomes a fruit, after fertilization
- (5) *Gnetum* – Bear seeds, which have similar appearance with Angiosperm fruit

14. What is the Phylum of Kingdom Animalia, which has following features?

- (a) Endoskeleton with plates
 - (b) Reduced and closed circulatory system with a heart.
 - (c) No segmentation or cephalization.
- (1) Arthropoda (2) Echinodermata (3) Mollusca
 (4) Platyhelminthes (5) Annelida

15. Select the **correct** statement regarding phloem translocation?

- (1) Phloem sap contains about 40% of sucrose, amino acids, hormones and minerals.
- (2) Free sugar concentration in sink is always lower than the sugar concentration in sieve tube elements.
- (3) Plant leaves act as the source and the growing tissues always act as sink.
- (4) Water potential increases in the sieve tube elements near the source.
- (5) Sugar loading occurs through apoplast pathway from leaf mesophyll cells to sieve tube elements.

16. Which one of the following statement is **correct** regarding the stem of Anthophyte plants?
- (1) Stomatal openings are never present in epidermis in any growth stage.
 - (2) Collenchyma cells may present inner to epidermis of woody stems for support.
 - (3) In a vascular bundle, primary phloem is oriented inwards and primary xylem is oriented outwards.
 - (4) Sclerenchyma cap is present surrounding vascular bundles in some plants.
 - (5) Vascular bundles are scattered through ground tissue in all monocot plants stems.
17. Which one of the following is **not** an adaptation of plants to capture light?
- (1) Bear tall and strong stems.
 - (2) Presence of different branching patterns.
 - (3) Presence of different arrangements of leaves on the stem.
 - (4) Presence of comparatively small leaves in plants growing in very dry or very cold environment.
 - (5) Vertical arrangement of leaves can capture light, efficiently in low light conditions.
18. **Correct** statement regarding guard cells,
- (1) Stomata opens due to decrease of curvature of inner walls of guard cells.
 - (2) Accumulation of K^+ ions in guard cells gets stimulated due to light.
 - (3) Absciscic acid acts on the membranes of guard cells and allows opening stomata.
 - (4) Elastic rings of cellulose micro fibrils are formed around circumference of the guard cells
 - (5) Stomata gets open due to decrease of turgid pressure of guard cells.
19. **Incorrect** statement regarding plant nutrition,
- (1) Green plants are photoautotrophs.
 - (2) Both living species get benefited in commensalism
 - (3) *Drosera* is an insectivorous plant species.
 - (4) Parasitism is harmful for only one living species.
 - (5) Insectivorous plants grow in Nitrogen deficit soil.
20. Which of the following elements perform below given (a), (b), (c) and (d) functions respectively?
- (a) Nitrogen fixation.
 - (b) Activity of stomata.
 - (c) Osmotic and ionic balance.
 - (d) Acts as a component of chlorophyll molecule.
- | | | |
|-------------------|-------------------|-------------------|
| (1) K, Fe, Mg, Cl | (2) Mg, Cl, Fe, K | (3) Fe, K, Cl, Mg |
| (4) Cl, Mg, Fe, K | (5) Mg, Fe, Cl, K | |

21. Which one of the following is **correct** regarding all plants of *Nephrolepis*, *Selaginella* and *Pogonatum* ?

- (1) External water is not required for fertilization of gametes.
- (2) Shows circinate vernation.
- (3) Stem is an underground rhizome.
- (4) Shows heteromorphic alternation of generations.
- (5) Shows heterospory.

22. Following (a), (b), (c) features were developed in a plant, when apply few growth regulators.

- (a) Rapid growth of plant upward without branching
- (b) Development of seeds rapidly
- (c) Promote ripening of fruits.

Which of the following answer gives the **correct** order of relevant growth regulators for each of above changes?

- (1) Auxin, Cytokinin, Absciscic Acid
- (2) Cytokinin, Absciscic acid, Ethylin
- (3) Auxin, Gibberelin, Ethylin
- (4) Gibberelin, Absciscic acid, Cytokinin
- (5) Ethylin, Gibberelin, Cytokinin

23. **Correct** statement regarding animal tissues,

- (1) All the cells of an epithelial tissue always found on a basement membrane.
- (2) Fibrous connective tissue consists of a large matrix.
- (3) Blood vessels and nerves present in cartilage tissue.
- (4) Cardiac and skeletal muscle cells are straighten by the presence of sarcomeres.
- (5) The structural and functional unit of nervous system is the neuron.

24. Which one of the following statement is **correct** regarding food digestion in human?

- (1) Chemical bonds in large molecules are broken down during mechanical digestion as well as chemical digestion.
- (2) Salivation occurs due to a nervous reflex
- (3) Only the smooth muscles involve in the movements of the digestive tract.
- (4) Mouth and stomach play a major role in specific defense of the body
- (5) Most of the food digestion occurs in jejunum.

25. Which one of the following is **correct** regarding engulfed proteinous food by man?

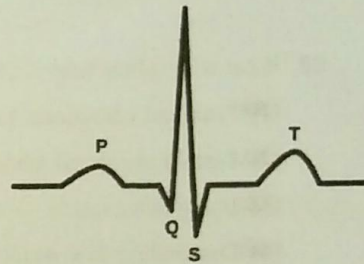
- (1) Chemical digestion of proteins initiates in buccal cavity.
- (2) Trypsin converts proteins into small polypeptides.
- (3) Chymotrypsin converts small peptides into amino acids.
- (4) Pepsinogen digests polypeptides into small polypeptides.
- (5) Small polypeptides are converted to amino acids by dipeptidase.

26. Which one of the following combination is **incorrect** regarding circulatory systems of animals?

- (1) Single circulatory system – Annelida
- (2) Closed circulatory system – All vertebrates
- (3) Open circulatory system – Molluscs
- (4) Double circulatory System – Reptiles
- (5) Systemic & Pulmonary circulatory systems – Fish

27. ECG diagram is given below. Which of the following indicates repolarization of atria?

- (1) By P
- (2) By R
- (3) By T
- (4) By QRS
- (5) None of the above



28. Below given are symptoms of a disease associated with respiratory system.

- Loss of appetite
- Loss of body weight
- High Perspiration

What is that disease?

- (1) Asthma
- (2) Tuberculosis
- (3) Lung cancers
- (4) Asbestosis
- (5) Silicosis

29. Select the **correct** statement regarding human respiratory system.

- (1) Increment of CO_2 level in tissues cause to decrease the depth and rate of respiration.
- (2) O_2 level in blood does not affect on the respiratory control center.
- (3) Decrease in pH value of cerebro spinal fluid is detected by the sensors in medulla oblongata.
- (4) The processes of inspiration and expiration are regulated by voluntary mechanisms.
- (5) During general inspiratory and expiratory process, inter coastal muscles, diaphragm muscles, muscles of neck and back get contracted.

30. Select the **Correct** statement regarding respiratory pigments,

- (1) Haemoglobin is a respiratory pigment found only in vertebrate blood.
- (2) Most of the Annelid's blood contains haemocyanin.
- (3) Myoglobin present in invertebrate muscles.
- (4) Haemoerythrin is found in the blood of marine invertebrates.
- (5) Chlorocruorin is present in haemolymph fluid in Arthropoda.

31. Select the **correct** statement regarding immunity.

- (1) Active immunity is a short term immunity.
- (2) Passive immunity is a long term immunity received due to obtaining antibodies produced from one organism to another.
- (3) Naturally acquired passive immunity is given by breast milk to the child.
- (4) Artificially acquired passive immunity is obtained by vaccination of attenuated pathogens.
- (5) The immunity derived by artificially acquired passive immunity is remained over life time.

32. What is the place where, the highest amount of water reabsorption occurs in urine formation?

- (1) Proximal convoluted tubule.
- (2) Distal convoluted tubule
- (3) Bowman's capsule
- (4) Descending limb of loop of Henle.
- (5) Ascending limb of loop of Henle.

33. The parts origin from human embryonic fore brain are,

- (1) Cerebrum, Thalamus, Hypothalamus
- (2) Cerebrum, Brain stem, Pineal body
- (3) Cerebrum, Thalamus, Pons varoli
- (4) Cerebrum, Hypothalamus, Pons varoli
- (5) Medulla oblongata, Pons varoli, Thalamus.

34. **Incorrect** statement is,

- (1) Pacinnian corpuscles are located at deep layers of the skin.
- (2) Pacinnian corpuscles are sensitive for high changes of pressure
- (3) Meissners corpuscles are sensitive for light pressures.
- (4) Most of the touch receptors identify vibrations.
- (5) Merkel's discs are not sensitive for light touch.

35. Which one of the following is **not** a tropic hormone secreted by pituitary gland?

- (1) TSH (2) ACTH (3) FSH (4) LH (5) GnRH

36. **Incorrect** statement regarding the homeostatic regulation of the body,

- (1) Mainly depends on negative feedback mechanism.
 (2) Homeostasis can be achieved by maintaining a variable in normal value or near to normal value.
 (3) Body temperature, blood pressure and blood glucose level are under homeostatic regulation.
 (4) Body temperature controlling centre in hypothalamus stimulates heat gain and heat loss mechanisms.
 (5) Liver stores vitamin C, D and B₁₂

37. Which one of the following shows the **correct** order of hormone, place of secretion and their relevant function?

Hormone	Place of Secretion	Function
(1) Testosterone	Prostate gland	Maintain male sexual features
(2) FSH	Corpus luteum	Regulate menstrual cycle
(3) LH	Human placenta	Maintenance of endometrium
(4) Thymocin	Anterior Pituitary	Development and maturation of T lymphocytes
(5) Oxytocin	Posterior pituitary	Squeezing of milk

38. Which one of the following is **correct** regarding human oogenesis?

- (1) Development of ova in ovaries of female initiates after the puberty.
 (2) Meiosis II is completed with the release of second polar body.
 (3) From birth to puberty, primordial germ cells in ovaries mitotically divide to form oogonia.
 (4) Primary oocytes present in ovaries at birth are in metaphase I stage.
 (5) LH hormone stimulates the growth of follicle cells.

39. Select the **correct** statement regarding spermatogenesis.

- (1) Primordial germ cells divide to form spermatogonia.
 (2) Seven months are taken to produce mature sperms from spermatogonia.
 (3) Sperms get matured and motile in seminiferous tubules
 (4) Leydig cells provide nourishment to sperms.
 (5) All four cells produced by one spermatogonium are converted to mature sperms.

40. Which of the following statement shows **correct** structure - function combination?

- (1) Epididymis – Produce sperms
- (2) Testis – Storage of sperms
- (3) Vas deference – Transport seminal fluid.
- (4) Seminiferous tubule – Produce semen
- (5) Sertoli cells – Secrete testosterone

- 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.

1	2	3	4	5
A, B, D correct	A, C, D correct	A, B correct	C, D correct	Any other response or combination of responses correct

41. Select the **correct** statement/s regarding cell cycle.

- (A) Proteins required for mitotic stage is produced in G_1 phase.
- (B) The check points of cell cycle are present in G_1 , S and G_2 phase.
- (C) Only one centriole is present in the cells at the beginning of the interphase.
- (D) Proteins essential for synthesis phase are produced in G_1 phase.
- (E) Few cell types such as liver cells are in G_0 phase.

42. Select the **correct** statement/s regarding the properties of water essential for life ,

- (A) Both polar and non-polar substances dissolve in water easily due to its polarity.
- (B) Water acts as a buffer during temperature changes on the earth.
- (C) The solubility of water depends on its ionic nature.
- (D) The high latent heat of vapourization of water is required for cooling the body surface of an organism.
- (E) Water acts as a transport medium due to its high cohesive nature only.

43. Select the **Correct** statement/s regarding lung volumes and lung capacities,

- (A) Inspiratory Reserve Volume – The extra volume of air that can be forcibly inhaled beyond the tidal volume
- (B) Residual Volume – The volume of air that remains in the lungs even after forceful expiration.
- (C) Inspiratory Capacity – The volume of air that can be exhaled after tidal volume.
- (D) Vital Capacity – The maximum volume of air which can be inhaled and exhaled.
- (E) Tidal Volume – The total volume of air that can be breath during normal respiration.

44. Which of the following fungi produce endospores during asexual reproduction?
- (A) *Agaricus* (C) *Mucor* (E) *Aspergillus*
(B) *Penicillium* (D) *Rhizopus*
45. Which of the following characteristic feature/s is/are **absent** in class – Osteichthyes?
- (A) Heterocercal caudal fin
(B) Body is covered by placoid scales.
(C) Presence of a swim bladder to control buoyancy.
(D) Gills are covered by operculum.
(E) Most of them perform external fertilization.
46. **Correct** statement/s regarding xylem vessel elements,
- (A) Water moves freely through perforated plates.
(B) Secondary walls are thickened by suberin.
(C) Long cylindrical cells.
(D) Present in all angiosperm plants and some gymnosperm plants.
(E) Water moves from one cell to another cell through pits.
47. Which one of the following statement/s is **correct** regarding plants?
- (A) Parthenocopy is the development of seeds without fertilization.
(B) Seed dormancy occurs due to inhibition of an embryo within the seed.
(C) Seed germination, shade avoidance like plant responses for light are regulated by phytochrome photoreceptors.
(D) Statoliths are a type of plastids rich with starch grains which are present in all plants.
(E) The growth of the opposite sides of tendrils of climbing plant is uniform due to touch.
48. **Correct** statement/s regarding substrate feeders,
- (A) Show different adaptations to tear food or capture prey.
(B) Feed on comparatively large food parts.
(C) Live inside or on the food source and eat the food.
(D) Consume plant leaves or soft tissues as food.
(E) Suck fluids using mouth parts.

49. Which of the following statement/s is/are **correct** regarding human nephron?

- (A) Few nephrons open to one collecting duct.
- (B) ADH acts on distal convoluted tubule.
- (C) Simple cuboidal epithelium is found in outer wall of Bowman's capsule.
- (D) Na^+ reabsorption occurs actively.
- (E) The diameter of efferent arteriole is higher than afferent arteriole.

50. Which of the following is/ are **correct** regarding human eye?

- (A) Aqueous humor is the part present in front of the eye lens.
- (B) There is no blood supply to cornea
- (C) Vitreous humor provide nourishment to lens capsule and remove wastes
- (D) Photo sensitive cells found in eye are rods and cones.
- (E) Colour vision is given by stimulation of rods in retina.

* * *

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 General Certificate of Education (Adv. Level), Grade 13 First Term Test, November 2019

ජීව විද්‍යාව II
 Biology II

09

E

II

පැය තුනයි
 Three hours

Index No :

Instruction :

- * This question paper consists of 10 questions in 11 pages.
- * This question paper comprises Part A and Part B. The time allocated for both parts is three hours.
 - Part A - Structured Essay (pages 02 – 10)
- * Answer all four questions on this paper itself.
- * Write your answer in the space provided for each question. Note that the space provided is sufficient for your answers and extensive answers are not expected.
 - Part B - Essay (page 11)
- * Answer four questions only. Use the papers supplied for this purpose. At the end of the time allocated for this paper, before handing over to the supervisor tie two parts together so that part A is on the top Part B.
- * You are permitted to remove only part B of the question paper from the examination hall.

For Examiners' Use only.

Part	Question No	Marks
A	01	
	02	
	03	
	04	
B	05	
	06	
	07	
	08	
	09	
	10	
Total		
Percentage		

Final Marks

In Number	
In Letters	

Code Numbers

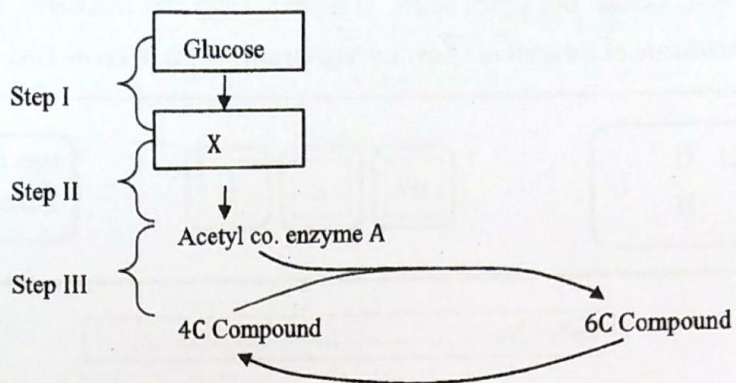
Marks checked by	
Supervised by	

Do not write anything in this column.

Part A – Structured Essay

- Answer all four questions in this paper itself.

01. (A) Below given flow diagram shows few steps of cellular respiration in yeast cells.



i. Name the steps I, II, III and state the locations of occurring those steps.

Step	Location
I.
II.
III.

ii. (a) Identify X.

.....

(b) Which substance should be present in the cell to occur step II?

.....

(c) What is the fate of X, if the above substance is absent?

.....

iii. What is meant by respiratory quotient?

.....

Do not write anything in this column.

iv. Below given are few readings of an experiment carried out by using a respirometer.

The height of the water column raised in U tube, when KOH present = 10 mm

The height of the water column raised in U tube, when KOH absent = 2 mm

Cross sectional area of tube = a

Calculate the respiratory quotient by using above readings.

.....
.....
.....
.....

v. What could be the respiratory substrate according to above results?

.....

(B) (i) Write **four** characteristic features of enzymes.

.....
.....
.....
.....

(ii) What is the enzyme responsible for catalyzing the reaction of hydrolysis of major storage compound in plant cells?

.....

(iii) Briefly describe an experiment to show the activity of enzyme mentioned in above (ii)

.....
.....
.....
.....

(iv) Draw **two** graphs to show the effect of

(a) Temperature

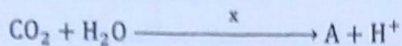
(b) pH Value on the rate of enzymatic reaction.

Do not write anything in this column.

(C) (i) What is the basis for considering photosynthesis as C₃ and C₄ pathways?

.....
.....

(ii) Identify x and y which catalyze following reactions related to C₄ photosynthesis.



x -

y -

(iii) Write **two** reasons for higher efficiency of y.

.....
.....
.....
.....

(iv) a) What is the principle of limiting factor?

.....
.....
.....

b) What is the major limiting factor for the process of photosynthesis during general conditions?

.....

c) State **one** instance in which, high concentration of above limiting factor is used.

.....

02. (A) (i) Into which phylum, that the first group of animals colonize the land belongs?

.....

(ii) Name the main excretory structure and excretory matter of the animals of that phylum.

Excretory Structure :

Excretory matter :

(iii) How many years before, that the human species originated?

.....

Do not write anything in this column.

(iv) State major steps of the process of natural selection.

.....
.....
.....
.....

(v) Write the taxa of plant taxonomic hierarchy of Linnaeus, in order.

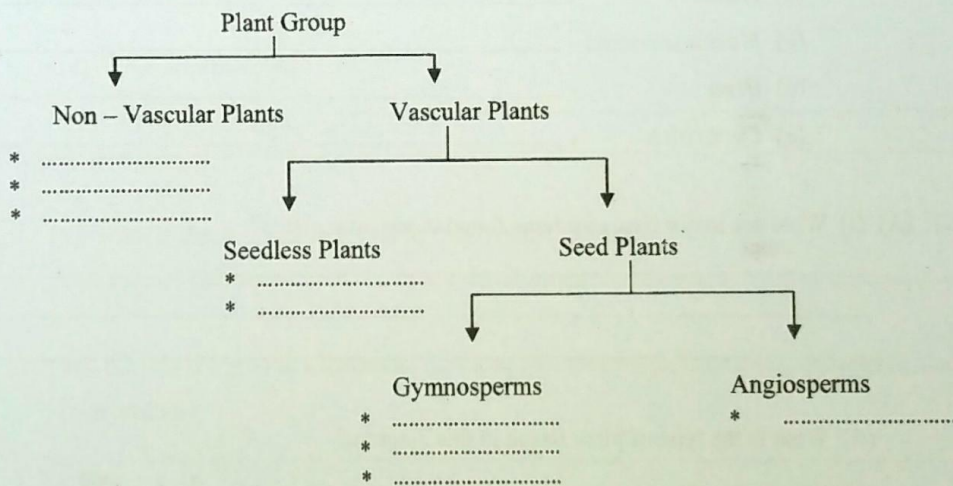
.....

(vi) State the biological definition of a species.

.....
.....
.....

(B) Following chart shows evolutionary relationships of terrestrial plants.

(i) Fill in the blanks with relevant plant phyla.



(ii) From which group of organisms, that the members of Kingdom – Plantae are originated?

.....

(iii) Write **four** main features present in the members of Kingdom Plantae, but not in the above group of organisms.

.....
.....
.....
.....

Do not write anything in this column.

(iv) Name the main parts of the ovule belongs to seed plants.

.....

(C) (i) Name an invertebrate animal phylum, which consist of organisms with segmented body

.....

(ii) (a) In which animal phylum, where first excretory organs evolved?

.....

(b) Name the excretory organ found in above animal phylum?

.....

(iii) Name the Kingdom and major cell wall component of each of the below given organisms.

Organism	Kingdom	Cell wall component
(a) <i>Rhizobium</i>	:
(b) <i>Mucor</i>	:
(c) <i>Methanococcus</i>	:
(d) <i>Ulva</i>	:
(e) <i>Cucurbita</i>	:

03. (A) (i) What are major tissue systems found in vascular plants?

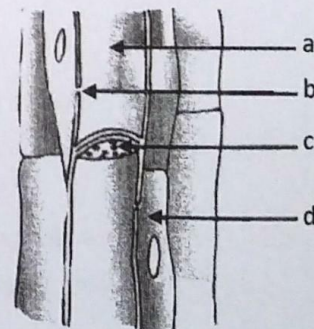
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(ii) What is the type of plant tissue in this diagram?

.....

(iii) Name the structures labeled as a, b, c and d.

- a -
- b -
- c -
- d -



(iv) Write two main structural features found in "a"

.....

Do not write anything in this column.

(v) What are the other types of cells found in this tissue other than the cells stated in above (iii) ?
.....
.....

(B) (i) Write a deficiency symptom of plants due to lack of each of the following element.

- K -
- Ca -
- P -

(ii) What are the main types of photoreceptors found in plants?
.....
.....

(iii) Write the response initiate by each of the above photo receptors.
.....
.....

(iv) What are statoliths?
.....
.....

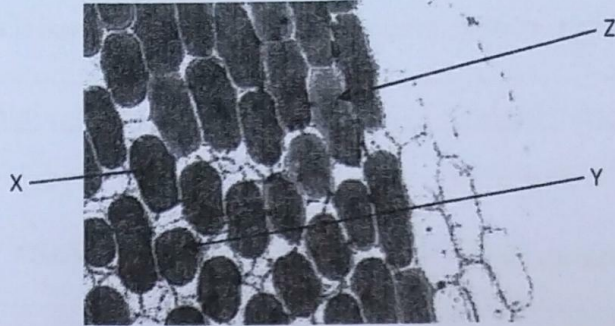
(v) What is the stimulus detected by statoliths of plants?
.....

(vi) What is the growth substance / hormone involves in the response explained in statolith hypothesis?
.....

(vii) Write a plant movement stimulated by above hormone/ growth substance.
.....

Do not write anything in this column.

(C) (i) Below diagram shows the microscopic view the cells of *Rhoeo* epidermal peel immersed in a hypertonic solution.



Write the relevant letters for the cell types which are in each of the following stages.

- (a) Turgid Cells :
- (b) Plasmolysed Cells :

(ii) Write an equation for water potential(ϕ) for each of the following cells by using symbols.

- (a) Turgid Cell :
- (b) Plasmolysed Cell :

(iii) State **two** effects of turgid pressure for plants.

.....

(iv) State the routes of water movement in plants and put (\checkmark) mark for the correct method of water movement in the following table.

Route	Mass flow	Osmosis

(v) Mention **two** important features of seed plants.

.....

Do not write anything in this column.

04. (A) (i) What is the specific feature of muscle tissue?

.....

(ii) State **three** major types of tissues found in vertebrate body.

.....
.....
.....

(iii) Which tissue type is associated with the skeletal system?

.....

(iv) Write a feature from which the action of above muscle type differs from the other types of tissues.

.....

(v) State the type of muscle tissue found in each of the following structures.

(a) Pyloric sphincter :

(b) Tongue :

(c) Proximal part of oesophagus :

(B) (i) What is Body Mass Index (BMI)?

.....

(ii) What is the range of Body Mass Index (BMI) value of a healthy person?

.....

(iii) Write abnormal conditions occur due to change of above range as below.

(a) Decreasing :

(b) Increasing :

(iv) How does the increment of BMI more than its maximum value affect for blood circulation?

.....

(v) What is meant by a heart attack?

.....

Do not write anything in this column.

(vi) What are the adverse effects of that?

.....

(C) (i) What is immunity?

.....

(ii) State **two** types of innate immunity found in animals and the way of action of each type.

(a)

.....

(b)

.....

(iv) Below given diagram is a longitudinal section of a human kidney. Name the parts a, b, c, d, e and f.

(a)

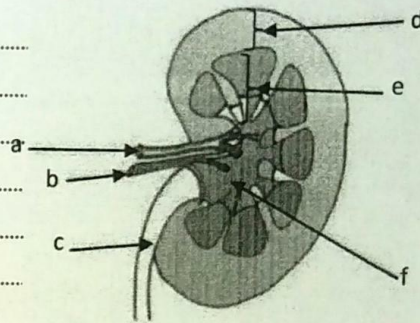
(b)

(c)

(d)

(e)

(f)



(v) What is the functional unit of this?

.....

(vi) State **three** major steps of urine formation and briefly describe what happen in each of these steps.

Step	Activity
(1)
(2).....
(3).....

Part B - Essay

- Answer **ONLY FOUR** questions.
Draw fully labeled diagrams where necessary.
Each question carries 15 marks

05. (a) Describe the chemical nature of lipids with examples.
(b) Write the functions performed by lipids in living bodies.
06. (a) State the features of plants of phylum - Anthophyta
(b) Describe the primary structure of a dicot root.
07. (a) Explain what is meant by transpiration.
(b) Describe the effect of external factors on transpiration.
08. (a) State the requirement of respiratory structures for animals and explain the characteristic features of a respiratory structure.
(b) Mention different respiratory structures of animals with examples.
09. (a) Describe the gross structure of human ear.
(b) Explain the process of hearing by human ear.
10. Write short notes on,
(a) Interphase
(b) Nerve impulse transmission through chemical synapse.
(c) Human sperm.