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Provincial Department of Education - NWP

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Third Term Test - Grade 13 - 2023

Index No. :.....

BIOLOGY - I

Time : 3 hours

Extra reading time 10 minutes

- **Answer all questions.**

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(01) Which of the most relevant statement regarding the sustainable food production?

(1) Production of food required to human population.

(2) Production of food adequate to human population.

(3) Production of food for the existance of the present population.

(4) Production of food using environmental conservation methods which are suitable for the human population.

(5) Production of food using environmental conservation methods which are adequate for the human population. (.....)

(02) What is the main reason for that to maintain the life on earth from some properties of water?

(1) Water molecule is small

(2) Water molecule is a polar molecule

(3) Angular molecule

(4) Production of H bonds with other water molecules

(5) Ionization ability (.....)

(03) Given below are some compounds of living matter and some reactions/ related to them. Which of them is not compatible?

(1) Glyceraldehyde-3-phosphate- a derivative of triose

(2) Phospholipids - Amphoteric

(3) Amino acid - Amphoteric

(4) Primase - type of RNA polymerase

(5) Serum albumin - regulate in blood clotting (.....)

(04) Which of the following statement is true, regarded the note given below.

DNA CCG AUG GUA ACU UAG GUC CGC

(1) The nucleoide is a sequence of a DNA chain.

(2) mRNA chain that can be provided codons for 8 amino acids.

(3) In this chain segment, there's a starting codon and ending codon

(4) According to chain the ending codon os CGC.

(5) According to the chian the codon that initiate the synthesis of a polypeptide is UCG.

(.....)

(05) Lower epidermal tissue of Tradiscantia was observed using the same eye piece and by using X10, X15X X40 objective lenses. Find the correct statement from the following.

(1) Transfer the specimen on the center of a clean, dry glass slide.

(2) Being able to observe a large field of view of the specimen even under low power X10.

(3) A higher number of cells can be seen under X15 of objective lense.

(4) A large area of the specimen can be seen through highpower objective lense

(5) It is more appropriate to use X10 lense count the number of cells in the filed of view (.....)

(06) Consider the following statements and select the correct answer.

a - Alignment of chromosomes at metaphase plate.

b - These points of crossing over become visible as chiasmata after the synaptonemal complex dissembles.

c - Moving of chromotids towards the opposite poles.

d - The pair of homologous chromosomes get arranged on the metaphase plate with one chromosome of each pair facing each pole.

e - Centrosomes move towards opposite poles.

Statements only can be seen in the meiosis

(1) bd (2) bde (3) ace (4) cd (5) ac (.....)

(07) Which of the following is true regarding the nucleus of a living cell?

(1) Every eukaryotic cell has an organized nucleus.

(2) The average diameter is about 5nm.

(3) The inner lining of the nuclear envelope is made up of protein filaments.

(4) The nucleus of a non dividing cell contains cromatins.

(5) Nucleus synthesizes r - RNA required only for protein synthesis. (.....)

(08) Which of the following statements is incorrect regarding ATP.

(1) ATP is a mobile molecule.

(2) The ATP hydrolysis reaction release energy.

(3) ATP can be produced within living cells within a long period of time.

(4) ATP molecule contains a ribanudeotide molecule.

(5) ATP can also be produced by sunlight. (.....)

(09) Photo respiration,

(1) Takes place in all plants.

(2) When happening RuBP is reduced.

(3) All the products formed in the oxygenase reaction leave the chloroplast.

(4) This reaction is aimed for energy absorption.

(5) There are no harmful affects on plants. (.....)

(10) Which of the following combination can be observed in the theory of natural selection ,

(1) Genetic variation and competition

(2) Over production and competition

(3) Over production and Survial of the fittest

(4) Genetic variation and overproduction

(5) Genetic variation and natural selection (.....)

(11) A table consist of some species, structures they bear and environment they live is given below.

Species	Structure	environment
(A) Paramecium	hold fast (P)	Fresh water (I)
(B) Sargassum	flagella (Q)	Terrestrial (II)
(C) Euglena	cillia (R)	Marine water (III)
(D) Chytridium	pellicle (S)	
(E) Ulva	cell wall (T)	

What is the response with the correct combination?

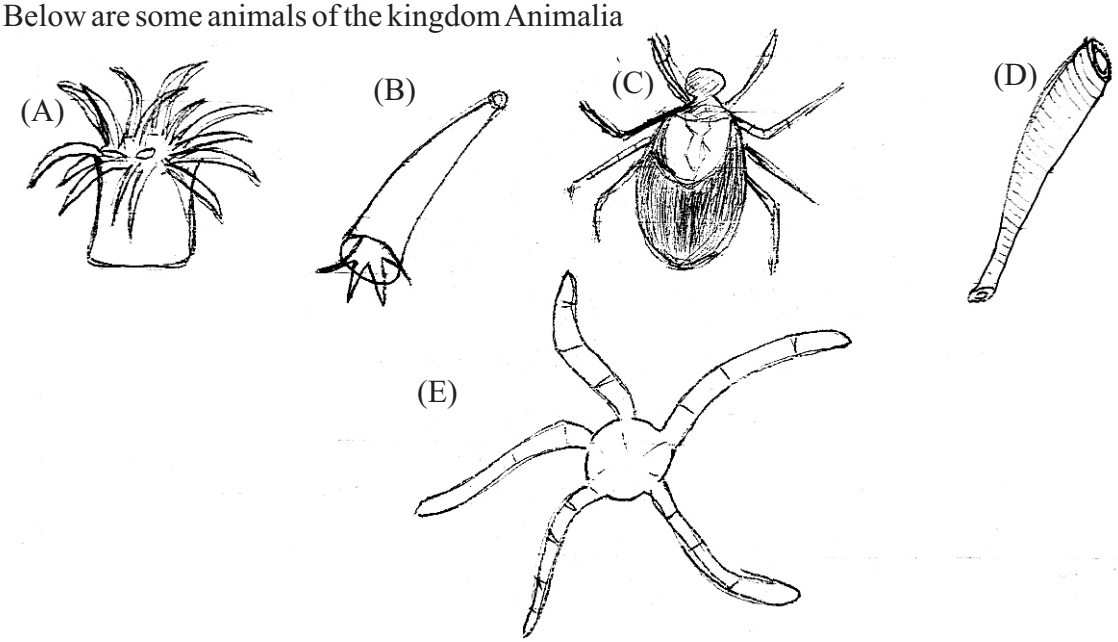
(1) A,R, III (2) B,P, I (3) C,Q, III (4) D,S, II (5) E,P, I (.....)

(12) Which plant bears a spore that is not dependent on the parent plant for reproduction? Which of the following plant bear a ..... which do not depend on gamephyte in development.

(1) Pogonatum (2) Lycopodium (3) Nephrolepis

(4) Cycas (5) Oryza sativa (.....)

(13) Below are some animals of the kingdom Animalia



Select the correct statement on above organisms.

(1) All have a triploblestic body organization.

(2) Among these only A and E are found in marine environment.

(3) These animals have kind of skeleton.

(4) All have bilaterally symmetrical body.

(5) Thus, B, C, D, E bear cardiovascular systems with hearts. (.....)

(14) Which of the following is true regarding the outer protective covering of a plant body?

(1) Composed of tightly packed several layers of cells.

(2) Always covered with a cuticle.

(3) Found in young & mature stems, roots & leaves.

(4) May contain shiny hairs to reflect excess sunlight.

(5) In everyplace has guard cells. (.....)

(15) Plants shoot have designed to capture maximum light, which of the following does not show a relationship with that statement.

(1) Grow taller
(2) Reaching higher levels with the help of a climbing plant support.
(3) Arrangement of leaves in a node on the stem.
(4) Broadening of the leaf blade growing in some environments.
(5) Vertical onentation of leaf blade. (.....)

(16) Guttation is a process that remove water from plants. which of the following is true in relation to guttation.

(1) It can happen at any time of the day.
(2) This is due to the transpiration suction pull.
(3) Can be happened in any plant.
(4) Transpiration can be occured when exposing in to sunlight even in a plant that show guttation.
(5) A direct result of root pressure and can be controlled when necessary. (.....)

(17) Which of the following response is incorrect regarding water potential and the components that affects on it?

(1) The water potential of an opean aqueous solution is equal to its solute potential.
(2) As solute are added to pure water, the solute potential decreases.
(3) When a cell is in equilibrium with an external solution, net migration does not occur.
(4) The maximum possible value for the pressure potential of a cell's equal to its solute potential.
(5) When a cell reaches a maximum pressure potential value, its water potential is zero. (.....)

(18) Which of the following statement is correct regarding the minerals cause for deficiency symptoms,

• Dwarf growth • Chloresis in older leaves

(1) A building block of all organic compounds in plants.
(2) Cycles only between organisms and soil naturally.
(3) It's an important element in metabolism.
(4) Adsorb by soil solution only as anion.
(5) Act as enzyme activators. (.....)

(19) Which of the following is acceptable in the sexual reproduction of angiosperm plants?

(1) A flower is a specialized shoot with whorls of modified leaves.
(2) Microspores are propagated by hypaspore division with in the microsporongia
(3) Fruit is produced only by fertilization does the ovary develop into a fruit.
(4) Producing colourful flowers is a special adaptation for pollination.
(5) Reduced female gametophyte which bears due to one egg cell. (.....)

(20) • Stimulate fruit growth • Regulates development of fruits • Promotes ripening of fruits which response is in correct order?

(1) Auxin, Giberaline, Ethylene,
(2) Giberaline, Auxin, Ethylene
(3) Giberaline, Ethylene, Auxin
(4) Auxin, Ethylene, Giberaline
(5) Ethylene, Auxin, Giberaline (.....)

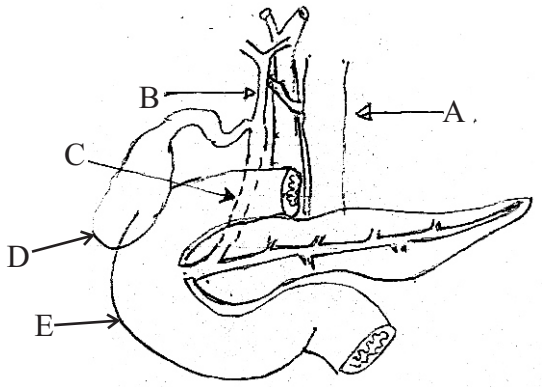
(21) For which response in plants is the photoperiod important.

(1) Phototrophism
(2) For seed germination
(3) For shade avoidance
(4) For Flowering
(5) For hypocotyl eleongation during the seedling development (.....)

(22) Which of the following is true regarding the tissue important for coordination?

(1) All the cells are important for the transmission of impulses.
(2) Some cells in the tissue have the ability to divide.
(3) The structural and functional unit is nerve cell .
(4) A nerve has all the parts of a neuron.
(5) A nerve cell has multi nucleated cytoplasm. (.....)

(23) The following figure shows a part of the human digestive tract and associated glands.



A student makes the following statements about this, which one is correct?

(I) C - Common bile duct (II) D - Produced bile
(III) B - Common hepatic duct (IV) E - The main function is absorption of nutrients
(V) A - Bring O_2 concentrated blood

(1) I, III, IV (2) I, III, V (3) II, III, V (4) I, II, IV (5) III, IV, V (.....)

(24) Body mass index of a person is 30kg / m^2, which of the following is true about that person?

(1) Malnourished person
(2) Can be affected diabete I
(3) There is a risk of osteoartherites
(4) This could be due to lack of essential nutrients in the diet.
(5) The amount of energy gained is less than the amount of energy expenditure. (.....)

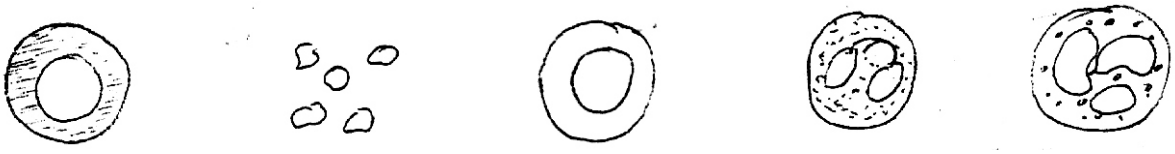
(25) Which of the following statement is incorrect regarding the organization of the vertebrate circulatory system,

(1) There are three main types of blood vessels namely arteries, veins an capillaries.
(2) The heart lies dorsaly to the esophagus.
(3) Capillaries are microscopic channels with thin, rigid walls.
(4) Blood flows in one direction in all types of vessels.
(5) Venules join together to from veins. (.....)

(26) Which of the following is not a complication of hypotension?

(1) Shock (2) Sitting / standing up suddenly from sitting.
(3) Hemorrhage (4) lack of nutrition / law nutrition
(5) long term dizziness (.....)

(27) When observing a human blood sample the following blood cells could be appear.



A B C D E

Which of the following is not compatible with these cell types?

(1) Erythro protein stimulates generating these blood of

(2) These are all derived from the red bone morrow.

(3) The most common form is type A.

(4) Some granules present in E contain heparin.

(5) Some C type cells development and maturation take place in thymus . (.....)

(28) Which is true about human breathing process?

(1) Always involuntary

(2) Major breath control centre is in pons varoli.

(3) Occurs by a positive feedback mechanism.

(4) Inhalation and exhalation are important to maintain normal blood pH level.

(5) Breathing control centre in medulla oblongata are responsible for regulating the breathing rhythem. (.....)

(29) Which of the following is not a complication of human respiratory system infection due to Mycobacterium tuberculose ?

(1) An infected patient develops a dis tressing cough.

(2) Blood may be comes out with the Saliva.

(3) Excessive sweating may occurs.

(4) Breathing becomes difficult.

(5) Loosing weight. (.....)

(30) Which of the following is true about the following forms of Immunity?

(1) Natural kiler cells - destroys foreign bodies

(2) Tear, Saliva, Mucus - only act as chemical barriers

(3) The inflammatory response - Histamine and Cytokinin act as signaling molecules

(4) Cyto totxic T cell - kills the pathogen directy by the antibodies

(5) Plasma cells - ingests cancer cells (.....)

(31) Blood volume and blood pressure regulation is an overal function of the kidneys, which of the following is not related to this?

(1) Secreate renin by kidneys.

(2) The sensitive receptors in the hypothalamus recognizes the blood pressure and volume drop off.

(3) Angiotensin II contributes to arterial constriction.

(4) Stimulation of adrenal glands for aldosterorie secretion.

(5) Large amount of water and Na^+ ions are absorbed by distal convoluted tubules. (.....)

(32) Which of the following is correct regarding the human's upper limb?

(1) bones are madeup of 60 pieces.

(2) The head of the humerus join with the glenoid fossa to form the shoulder joint.

(3) Radius in a lateral position when the pronation (palm down)

(4) The joints between metacarpal and phalanges allow movement of the fingers and permit the power grip.

(5) 8 carpal bones which are arranged in two rows. (.....)

(33) A normal winged drosophila fly with gray bodies was mated with a fly with vestigial wings and black bodied and obtained F_1 offsprings. All F_1 offsprings bears grey body and normal wings, offsprings that taken by a test cross from F_1 it shows equal phenotype to their mothers. Which of the following statement that can be agreed?

(1) This cross happen according to the Mendelian inheritance.

(2) The alldes related to body colour and feature of wings are with independent assailment.

(3) The vestigial wings with grey colour are dominant.

(4) The features of the above mentioned gene alleles are with seperate colours by one by one.

(5) The gene alleles relevant to the following features situated near in the same chromosome.

(.....)

(34) Which statement is consistent with hybrid breading, a breading method used in plant and animal breeding?

(1) done between genetically close individuals.

(2) preserves desirable characteristics.

(3) The mother organism should be conterminously maintained.

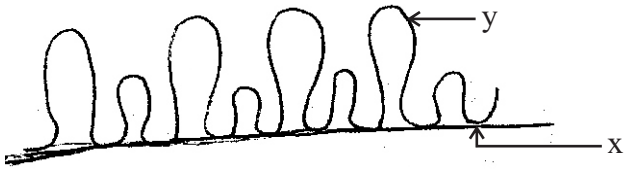
(4) Super genes can be accumilated

(5) Malus domestica is produced by dihybrid breeding. (.....)

(35) In any perfect population, the total no: of organisms is 10 000 of which 3200 are hererozygous. If the ratio of homozygous dominant to homozygous carriers is 16:1 then the no. of dominant recessive individuals in the population is,

(1) 3200 (2) 6400 (3) 4800 (4) 1600 (5) 400 (.....)

(36) There are several organizational levels in forming chromosomes, given diagram is shown one level of that process.



Consider the following statement and select the correct answer.

(1) The just before level for above level that diagram mentioned is the formation of nucleosomes.

(2) Here, y- radial loop domain, X-RNA and protein scaffold.

(3) the diameter of above mentioned structure is 30nm.

(4) 700nm chromatids are form by coil, fold and father compact of "Y".

(5) Finally, the looped domains coil, fold and fother compact to form 1500nm chromosome. (.....)

(37) In a substitution mutation the sequence of cadons in the DNA determining, an amino acid is changes due to the replacement of one nucleotide by another,

Normal - AGC ATG GAT CCT

Mutated - AGC ATG GAT CAT

The following are some amino acids translated codons.

mRNA codon	AAG	CUA	GGA	GUA	UAC	UCG
Amino acid	Lysine	Leusine	Glycine	Valine	Tyrosine	Serene

Which one of the amino acid has mutated?

(1) Glysine - Valine (2) Lysine - Glycine (3) Serene - Leucine

(4) Tyrosine - Lysine (5) Valine - Serene (.....)

(38) In thundra biome,

(1) It is the largest biome on earth.

(2) Located only in high latitude.

(3) The permafrost layer restricts plant root growth.

(4) Human activity is at a very high level.

(5) Due to high rainfall, the soil becomes moist. (.....)

(39) What response is inconsistent with Sanitary land filling?

(1) One of the most popular waste removal methods.

(2) Most of the municipal solid waste is removed by this

(3) Harmonious layering reduces waste volume.

(4) Decomposes only through biological processes.

(5) Ground strips high ground water level are not suitable for this. (.....)

(40) Which of the following is false about tissue Culture techniques commonly used in agriculture today?

(1) Genome innovation.

(2) Based on the concept of aggregate generation.

(3) Plant growth in the plant medium by Gibberellin and Cytokinine is used here.

(4) Agar is used as solidifying agent.

(5) Provision of living conditions is essential. (.....)

- **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 ABC are correct (1)

If only ACD are correct (2)

If only AB are correct (3)

If only CD are correct (4)

If any other response or combination of responses is correct (5)

(41) Wich statements are acceptable regarding the mechanisms that regulate the enzyme acivity during metabolism in living cells?

(A) In allosteric enzymes, the subunit binds to the active site covalently of an enzyme.

(B) The subunits affects only on the shape of the enzyme.

(C) Most allosteric enzymes are composed of two or more subunits.

(D) Synergism increases the catalytic activity.

(E) ADP act both as an allosteric potentiator and as an inhibitor. (.....)

(42) Which of the following responses related to the human peri pheral nervous system is false?

(A) Transmits impulses only towards the central nervous system.

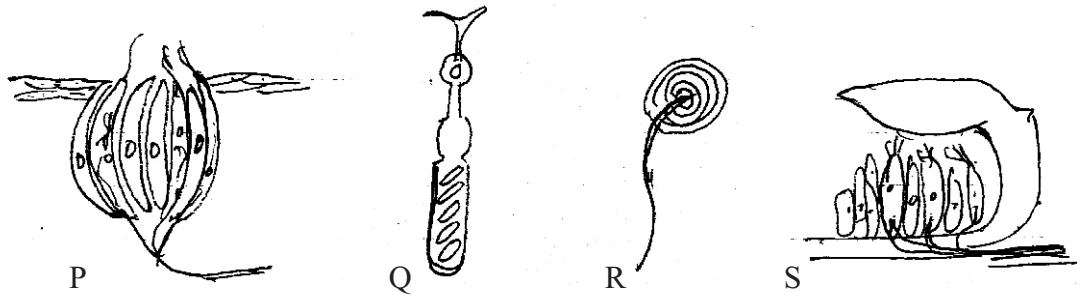
(B) Efferent system controls only voluntery actions.

(C) Control of the cardic muscles is done by autonomic nervous system.

(D) Noepinepnne secretes by para sympathetic system.

(E) Afferent nerve exist only in the spinal cord. (.....)

(43)



Which of the following is correct with the figures?

(A) Following are the sensoy receptors of human.

(B) P and Q as sensitive to chemical substances.

(C) R and S are shock absorbers.

(D) Q is situated in the retina and R is in the human skin.

(E) Impulses generated by Stimulating S is transmitted in to temporal bone (.....)

(44) Which of the following features can not be seen in the mother and fetus when there is a fetus in the womb which is about 7-5cm long,

(A) lowering of hGC in mother.

(B) Development of heart is not occured.

(C) The corpus luteus is present in the mothers ovary.

(D) The fetus is very active.

(E) Morning sickness of the mother. (.....)

(45) Which of the statements have matched correctly regarding the genetic pattern and traits.

(A) A, B blood group - Multiple allels

(B) Pinch the cheek (dimple cheek) - Mendelian genetics

(C) Colour of the *Lathyrus* plant - recessive epistasis

(D) Hemophilia - Versatile

(E) The man's intelligence - Epigenesis (.....)

(46) Which of the following is the correct regarding the techniques followed in the recombinant DNA technology?

(A) Pheonol can be used to release the attached DNA.

(B) A Source of ECORI is *Thermus aquaticus*

(C) Ethydium Bromide is used to observe DNA in Gell electrophoresis.

(D) Gene cloning is the process of obtaining more copies

(E) Inserting plasmid cloning vector in to a host cell is very efficient process. (.....)

(47) National parks are created under the process of conservation which of the following does not apply to such a process of conservation,

(A) In Situ conservation

(B) Establishment of large population of organisms

(C) Exsitu conservation

(D) Adequate and suitable accomodation should be provided.

(E) Asserts the protection of the species only. (.....)

(48) The following are some of the principles used to obtain the final results in which are the correct combinations biology,

(A) A single cell protein - microbial cells

(B) Hepatitis B Vaccine - genetically modified microorganisms

(C) Fibre production - Fruit of microbial metabolism

(D) Alcoholic drinks - Fruit of microbial metabolism

(E) Bioremediation - microbial cells (.....)

(49) Which of the following is not a bacterial discase of the alimentary tract?

(A) typhoid (B) Hepatitis (C) Leptospyrosis

(D) Cholera (E) Rubella (.....)

(50) Which is not a factor associated with the transmission of Barava disease in the community in Sri Lanka?

(A) The No. of people infected with.

(B) Population density of he vector mosqute.

(C) The density of micro filanae larvae in lymph of infected person.

(D) Malnutrition with the man.

(E) The no. of times that vector and man meet. (.....)

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Provincial Department of Education - NWP

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Index No. :.....

BIOLOGY - II

Time : 3 hours

Extra reading time 10 minutes

- **Part A -** Structured Essay. Answer all questions on the paper itself.

PART A - STRUCTURED ESSAY

(01) (A) (i) Knowledge of biological concepts is important in solving some legal and ethical issues. Write those two occasions.

.....

.....

(ii) Water can act as a transport medium. Which property of water affected to that ability.

.....

.....

(iii) (a) Name a long distance transport method in plants.

.....

(b) How the above mentioned transport method different from short distance transport methods.

.....

.....

(iv) (a) Name a disaccharide which gives molecules with different carbonyl groups by hydrolysis in living matter.

.....

(b) Write two functions performed by above disaccharide in living matter.

.....

.....

(v) (a) Write the equation of hydrolysis of above disaccharide in human digestive system.

.....

(b) In which reagon of human digestive tract, the above disaccharide hydrolyzed.

.....

(B) (i) (a) Introduce what is central vacuole.

.....

.....

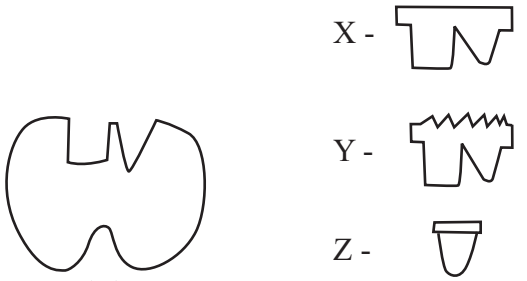
.....

(b) Write two functions of central vacuole other than storage of materials.

.....

.....

(ii) "A" denoted an enzyme. "X" is specific substrate for the enzyme.



(A)

(a) Y and Z are molecules which decrease the rate of catalytic action by binding to the enzyme in a certain way. How do you identify Y and Z.

Y :- .....

Z :- .....

(b) How Y and Z decrease the rate of reaction.

Y :- .....

.....

Z :- .....

.....

.....

(iii) (a) For which purpose keys are used in biology.

.....

(b) What is the most commonly used type of key.

.....

(iv) Name a group of protista which is photoautotropic, unicellular and bear cell walls.

.....

(v) Write answers for following regarding the above protista group.

(a) Composition of cellwall :- .....

(b) Habitat :- .....

(C) (i) (a) To which phylum do club mosses and spike mosses belong.

.....

(b) Write two characteristic features of above mentioned phylum.

.....

.....

(ii) How do the plants of above phylum reproduce.

.....

(iii) (a) What is the animal phylum that can be seen a true coelom in first time in the animal world.

.....

(b) Mention two structural features of above phylum.

.....

.....

(iv) What is the nature of nervous system of above phylum.

.....

.....

(v) What is the structural and functional unit of vertebrate nervous system.

.....

.....

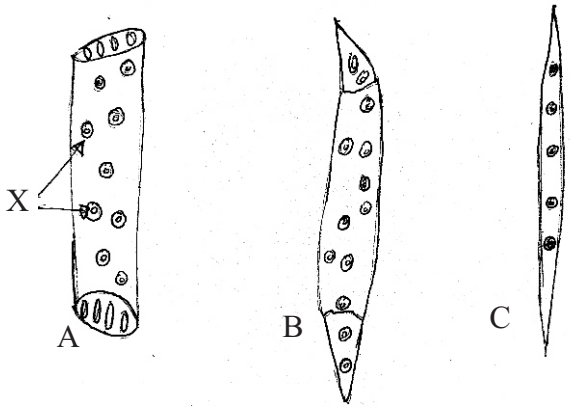
(vi) How do sexual reproduction of *Agaricus* occur.

.....

.....

.....

(02) (A) Answer following questions using given diagrams.



(i) Three types of cells are given as A,B,C.

Name a plant tissue consist of all the above three types of cells.

.....

(ii) (a) What is the main function performed by above mentioned tissue.

.....

(b) Write two structural characteristics of the cells of relevant tissue to perform its main function.

.....

.....

(iii) (a) What is "X". state its location.

.....

(b) Write a important of "X" in this tissue.

.....

(iv) Introduce guttation.

.....

.....

.....

(v) (a) What is the process affected to occur guttation

.....

.....

(b) What are the environmental condition important for phototropism.

.....

.....

(B) (i) (a) Introduce phototropism.

.....

.....

(b) What is the growth regulator important for the phototropism.

.....

(ii) How a plant shoot respond to phototropism.

.....

.....

.....

(iii) (a) What is meant by drought stress.

.....

.....

(b) What is the growth regulator released in drough stress conditions excessively.

.....

(iv) How does a certain stress condition affect a plant.

.....

.....

.....

(v) A experiment was planned using *Alocasia* leaf petioles to find out water potential in school laboratory.

(a) What is the concept use to find water potential in this experiment.

.....

.....

.....

(b) Curvature of some *Alocasia* leaf petioles have increased than before. What is the reason for it.

.....

.....

.....

.....

.....

(C) (i) Name a animal phylum which body wall is compose only with longitudinal muscles.

.....

(ii) (a) What is the special location of epithelial tissue.

.....

Name the type of epithelium in following places of human body.

1) Bowman's capsule :- .....
2) Skin epidermis :- .....
3) Thyroid gland :- .....
4) Lining of blood vessel lumen :- .....

(iii) (a) Blood considered as a specialized connective tissue. Write two reasons for it.

.....

.....

(b) Write the main function of blood connective tissue.

.....

.....

(iv) Why do doners blood cells sometime coagulate in recipients body during blood transfusion.

.....

.....

.....

(v) Name the genetic concept that can be seen in following occasions.

a) Forming AB blood group. :- .....

b) Formation of blood Rhesus factor. :- .....

c) Formation of ABO blood group. :- .....

(03) (A) (i) Why do specialized respiratory surfaces are require for gaseous exchange with the animal evolution.

.....

.....

.....

.....

.....

(ii) Name two respiratory surfaces with a large surface area found in animal world.

.....

.....

(iii) Write an example of animal which posses following respiratory surface.

(a) Skin :- .....

(b) Book lungs :- .....

(c) Tracheal system :- .....

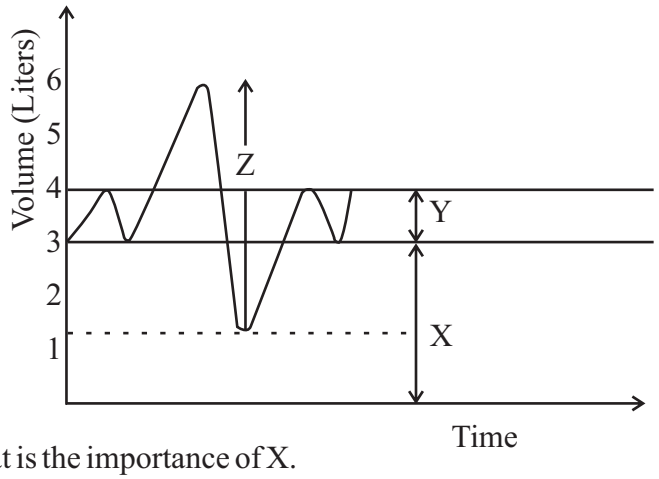
(iv) Why do lung ventilation of human consider as a negative pressure breathing.

.....

.....

.....

(v) Answer the following questions using graph below.



(a) What is the importance of X.

.....

.....

(b) Introduce Y.

.....

(c) State the value of Z of females.

.....

(B) (i) Name two areas of human body which produce hormones affected for the activity of kidney.

.....

.....

(ii) Name the above two hormones and state their effect on kidney.

Hormone Effect

.....

.....

.....

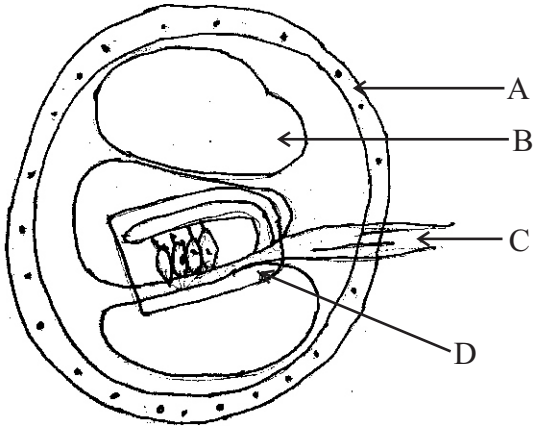
(iii) (a) What is the problem arise in the body due to kidney failure.

.....

(b) What is the treatment given to above mentioned condition.

.....

(iv) (a) Identify the following diagram. .....



(b) What is denoted by "A" in the diagram.

.....

(c) Name the cells consists of "D".

.....

(d) What is included in "B".

.....

(e) What is "C" state its function.

.....

.....

(C) (i) Write two occasions that apply micro-organism in environmental management.

.....

.....

(ii) (a) What is meant by mycorrhizae.

.....

.....

(b) State an important of mycorrhizae.

.....

.....

.....

(iii) (a) What are the steps which chemoautotrophs are participating in nitrogen cycle.

.....

(b) Write the bio chemical reactions which participate above bacteria.

.....

.....

(c) Activated carbon is used in some water treatment plants. State the relevant step and purpose they used.

.....

(iv) (a) Write a advantage and disadvantage of ornamental fish culture.

1) Advantage : .....

.....

2) Disadvantage : .....

.....

(b) State two types of losses in post harvest lost.

.....

.....

(v) (a) What is the source of obtaining embryonic stem cells.

.....

(b) Why do applying of adult stem cells is limited in tissue repair.

.....

.....

.....

(04) (A) (i) Write two reasons to success the mendelian experiments.

.....

.....

.....

.....

(ii) (a) A homozygous tall plant with yellow colour and round seeds cross with a plant which is short, green colour and wrinkled seeds. All F_1 individuals in the progency were tall, yellow colour and having round seeds. F_1 self cross and obtained F_2 progeny. What would be the probability of getting heterozygous individuals for all the three characters in F_2 progeny.

.....

.....

(b) There were 2560 individuals in the F_2 progeny. How many homozygous individuals in the progeny for all three characters.

.....

(iii) (a) What is the use of Hardy-weinberg equilibrium.

.....

.....

(b) State two characteristics of a population which is deviate from Hardy-weinberg equilibrium.

.....

.....

(iv) Write a advantage when a population undergo to evolution.

.....

.....

(v) (a) What is inbreeding depression.

.....

.....

(b) State two concepts based on genetics in plant and animal breeding techniques.

.....

.....

(vi) (a) What are euchromatin.

.....

.....

(b) Write a function of euchromatin.

.....

(B) (i) What is a biome.

.....

.....

(ii) Name three major terrestrial biomes.

.....

.....

.....

(iii) (a) Name the three major groups of ecosystems in Sri Lanka.

.....

.....

.....

(b) State examples for Critically endangered species and indigenous species.

1) Critically endangered species : .....

2) Indigenous species : .....

(iv) State two recreational values of bio-diversity.

.....

.....

(v) (a) What is the international convention which cover all aspects of bio-diversity conservation.

.....

(b) Name two types of wastes defined as "other wastes" in Basel Convention.

.....

.....

(C) (i) Give two reasons to consider DNA as a essential genetic material in most organisms.

.....

.....

(ii) What is meant by DNA replication.

.....

.....

(iii) (a) Write 02 ways that transcription different from replication.

.....

(b) What is the enzyme showing a similar action to DNA helicase enzyme in protein synthesis.

.....

(iv) Name the components of transcription initiation complex.

.....

.....

.....

(v) Write two components that can be attach to polypeptide chain at the post-translational modifications.

.....

.....

(vi) Name genetically modified products use as treatments in following occasions.

(a) Diabetes :.....

(b) Haemophilia :.....

(c) Heart attacks :.....

- **Answer 04 question only.**

PART B - ESSAY

(01) (i) Introduce C_4 plants and explain the process occur in C_4 photosynthetic pathway.

(ii) Briefly describe the adaptations of the tissue structure of C_4 plant leaf for its functions.

(02) (i) Explain the way of transporting water and minerals from soil solution to xylum of root.

(ii) Explain the K^+ influx hypothesis.

(03) Explain the homeostasis regulation of body temperature in human.

(04) (i) Briefly explain the way of inheritance of human sex linked characters.

(ii) Write a short description on plant and animal breeding.

(05) (i) Explain the factors affecting to decertification and its effects.

(ii) Explain the threats for bio-diversity.

(06) Write short notes on,

(i) Assisted reproductive technology.

(ii) Phylum basidiomycota

(iii) Life cycle of dengu vectors

Provincial Department of Education - NWP
Third Term Test - 2023
BIOLOGY

Grade 13

Answer Paper

PART - I

1 - (5) 2 - (4) 3 - (5) 4 - (3) 5 - (2) 6 - (1) 7 - (4) 8 - (3) 9 - (2) 10 - (4)
11 - (3) 12 - (5) 13 - (3) 14 - (4) 15 - (5) 16 - (4) 17 - (2) 18 - (3) 19 - (5) 20 - (2)
21 - (4) 22 - (2) 23 - (2) 24 - (3) 25 - (2) 26 - (5) 27 - (1) 28 - (4) 29 - (4) 30 - (3)
31 - (2) 32 - (4) 33 - (5) 34 - (3) 35 - (2) 36 - (4) 37 - (1) 38 - (4) 39 - (4) 40 - (3)
41 - (4) 42 - (1) 43 - (5) 44 - (1) 45 - (5) 46 - (2) 47 - (5) 48 - (3) 49 - (5) 50 - (4)

(එක ප්‍රශ්නයකට ලකුණු 02 බැගින් මුළු ලකුණු 100 යි.)

PART - II

Structured Essay

(01) (A) (i)
- Parentage testing
- in criminal investigations
- to solve immigration disputes

(ii)
- cohesive forces between water molecules
- Adhesive force between water molecules and other molecules.

(iii) (a)
- Bulk flow

(b)
- Short distance transport occur according to a concentration gradient.
- Long distance transport - Independent from solute concentration gradient. / does not occur through membranes.

(iv) (a) Sucrose

(b)
- Storage (sugar cane plant)
- translocate in phloem.

(v) (a) $Sucrose + H_2O \xrightarrow{Sucrasc} glucose + fructose$

(b) duodenum in small intestine

(B) (i) (a)
- a large structure bound by tonoplast
- filled with cell sap
- found in plants

(b)
- maintain water balance of the cell
- Gives turgidity and support to cell
- Produce colours in some plants with sap pigments.
- help for digestion

(ii) (a)
Y :- Compitive inhibitors
Z :- non-compiitive inhibitors

(b)
Y :-
- They compete with the substrate selectively for the active site of enzymes.
- Number of active sites available for the enzyme may decline.

Z :-
- These do not compete with substrate molecules.
- They are bind to a part of enzyme other than active site.
- Change the shape of active site.
- Become less effective formation of enzyme-substrate complex.

(iii) (a) To group organisms and identify them.

(b) Dichotomous keys

(iv) Diatoms

(v) (a) Pectine and silica

(b) marine and fresh water / aquatic

(C) (i) (a) Lycophyta

(b) • Dominant plant is sporophyte
• Produce upright stems and ground hugging stems
• small leaves
• have strobili
• homosporous of heterosporous
• In some species gametophyte live below the ground (nourished by symbiotic fungi)

(ii) by spores

(iii) (a) Annelida

(b) • clitellum • parapodia • s eate

(iv) • dorsal cerebral ganglion
• ventral nerve chord
• circumenteric connectives

(v) • structural - nurone • functional - reflex arch

(vi) • produce fruiting body - basidio carp
• produce basidia on the gills
• produce basidiospores

(02) (A) (i) Xylum tissue

(ii) (a) transport of water and minerals

(b) • secondary wall thicken with lignin. (provide support to prevent collapse under tension)
• form xylum vessel by aligning end to end with perforation plates.
• secondary walls are interrupted by pits.

(iii) (a) • pits
• in secondary walls

(b) • transport of water from one cell to the other in tracheids.

(iv) • Removal of water droplets.
• from leaf tips or leaf margins.
• of some herbaceous plants

(v) (a) Due to root pressure more water enter to leaves than loss by transpiration.

(b) • High relative humidity
• low temperature conditions / cool humidity environmental conditions

(B) (i) (a) shoot apex grow towards or away from light.

(b) Auxin

(ii) • Differential growth of cells on opposite sides of the shoot.
• The cells in the darker side elongate faster than the cells toss the brighter side.

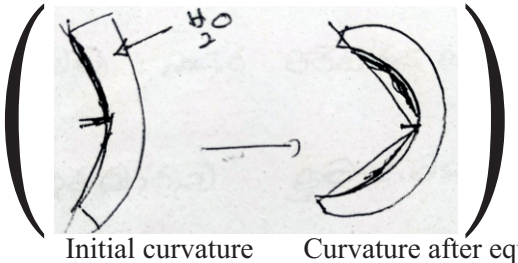
(iii) (a) Plant wilt as a result of rate of transpiration is higher than the water absorption rate.

(b) ABA / Absisic acid

(iv) It affects to plant existance, growth and reproduction.

(v) (a) Find out the concentration of external solution which is isotonic to *Alocasia* leaf petiole cells.

(b)



Initial curvature Curvature after equilibrium

- Water potential of external water is higher than the water potential of *Alocasia* petiole cells.
- Tissue cells undergo to end osmosis.
- Increasing curvature as cells get turgid, increase at volume and elongation of cells.

(C) (i) Nematoda

(ii) (a)
- External or Internal free surface

(b)
- Simple squamous epithelium
- Statified squamous epithelium
- Simple cuboidal epithelium
- simple squamous epithelium

(iii) (a)
- matrix is a liquid
- fibers are not present always
- matrix is not secreted by the cells

(b)
- transport of materials
- protection
- osmoregulation

(iv)
- Matrix of blood is not secreted by the cells.
- Fibers are formed only during blood clotting process.
- The extracellular matrix of the blood is liquid.

(v) a) co dominance

b) mendalyan genetics

c) polyallelism

(40 x 2½ = 100 marks)

(03) (A) (i)
- In large animals, body complexity and energy requirement is high
- bulk of cells in the body lack immediate access to the external environment.
- Gas exchange through the body surface is not adequate, specialized respiratory surfaces have evolved.

(ii) • Tracheal system • Lungs • Gills

(iii) (a) Frog

(b) Scorpion / Spider

(c) Cockroach / bees

(iv) In inhalation air is pulled rather than pushed into lungs.

(v) (a) for continuous exchange of gas in the alveoli / to prevent the callopse of the alveoli during expiration

(b) Volume of air inhated and exhaled with each breath during normal breathing

(c) 3100 ml

(B) (i) Hypothalamus / Adrenal cortex

(ii) • ADH - stimulates to increase reabsorption of water by distal convoluted tubule and collecting duct.

• Aldosterone - stimulates he reabsorption of sodium ions and water from distal convoluted tubule.

(iii) (a) Waste products and excess fluids are accumulated in blood.

(b) Dialysis

(iv) (a) cross section of cochlea of internal ear

(b) A - temporal bone

(c) B - auditory hair cells / supporting cells

(d) perilymph

(e) • auditory norve

• nerve impulses passed to the auditory area of brain

(C) (i) • Bio remediation

• solid waste treatment

(ii) (a) • symbiotic association between plant

• root with fungi

(b) • extend the surface area over which nutrients and water can be taken up by plant.

• They can reach small spores in soil where plant roots cannot reach and uptake nutrients.

• increase uptake of immobile nutrients such as phosphorous, zinc, Cu

(iii) (a) Nitrification

(b) $NH_4^+ \xrightarrow{\text{Nitrosomonas}} NO_2^- \xrightarrow{\text{Nitrobacter}} NO_3^-$

(c) • Filtration

• for the removal of toxic chemicals

(iv) (a) 1) advantages :
- species conservation.
- production of species that are difficult to obtain from the wild.
- As a hobby and reintroduced to habitats in which they have been eliminated.

2) disadvantages :
- Invasive species could affect for native organisms.
- with imported live fish, non-indigenous diseas causing agents come in to a country.
- It may cause antibiotic resistance to chemicals used on pathogenic microorganisms and human pathogenic bacteria.

(b) • weight loss due to spoilage • quality loss

• nutritional loss • seed viability loss

• commercial loss

(v) (a) Inner cell mass of blastocyst

(b) • When adult stem cells are transplanted from one site in the body to another.

• They generally remain faithful to their origin.

(04) (A) (i)
- Carried out thousands of genetic crosses of any given kind.
- kept accurate records of his results.
- He usually followed up each cross for at least two offspring generations F_1 and F_2
- did a quantitative analysis of the phenotypes of the resulting offspring.

(ii) (a) 8/64 / 1/8

(b) 80

(iii) (a) used to assess whether a population is evolving with respect to a particular characteristic / genetic locus

(b)
- occur mutations
- do not occur random mating
- occur natural selection
- size of population is small
- occur immigration or emigration

(iv) After the evolution the population is at a higher adaptive level compared to the level before.

(v) (a) having a reduced genetic fitness in a given population as a result of inbreeding

(b)
- mutation breeding
- polyploid
- genetic modification

(vi) (a) Chromation (DNA - protein complex is lightly packed

(b) active in transcription

(B) (i) A large geographical area which is classified based on the predominant vegetation adapted to the particular environment.

(ii) • Tropical forest • Savanna • Desert

(iii) (a)
- Terrestrial ecosystems
- Inland wetland ecosystems
- Ecosystem with coastal areas

(b) 1) Critically endangered - Dumbara galpara diyamadiya

2) Indigenous species - Lula / Kithul

(iv) • Provide opportunities for recreational activities • hobbies bird watching / photography • artistic activities • poetry • paining • dance

(v) (a) Convention on Biological Diversity

(b)
- Heavy metals Pb / Hg
- Hospital waste

(C) (i)
- Accurate replication
- transmission from one generation to the other
- ability to stor and express hereditary information

(ii) process which copies a double stranded DNA molecule to produce two identical copies

(iii) (a)
- copy is a mRNA molecule
- only one DNA strand act as template

(b) RNA polymerase

(iv) • Ribosomal subunits
• mRNA molecule
• initiatory tRNA

(v) • sugars • lipids • phosphate groups

(vi) (a) human insulene
(b) factor VII
(c) tissue plasminogen activator (tPA)

Part B - Essay

(01) (i) 1. First stable product of Co_2 fixation is a C_4 compound.
2. Oxaloacetate
3. eg.: maise / sugar cane / grasses
4. Initial Co_2 fixation of C_4 plant is
5. Occur in cytoplasm of mesophyl cell
6. It is catalyzed by PEP carboxylase enzyme
7. Initial Co_2 acceptor is a C_3 compound PEP.
8. This results OAA which is a C_4 compound.
9. Oxaloacetate is rapidly convered to more stable C_4 acid malate.
10. Malate diffuse in to bundle sheath cells.
11. through plasmadesmata
12. In bundle sheath cells malate release Co_2
13. It is catalyzed by decarboxylation enzymes
14. It result pyrurate which is a C_3 compound
15. Pyrurate diffuse into mesophyl cells again
16. by hydrolysis of ATP
17. It take PO_4 groups
18. regenerate PEP
19. bundle sheath cells fixed Co_2 again in chloroplast
20. It is catalyzed by Ribisco enzyme

(ii) 1. In most C_4 plants the Co_2 concentration mechanism is achieved by a division of labor.
2. between two distinct specialized leaf cell types
3. the mesophyll cells
4. bundle sheath cells
5. The bundle sheath cells enclose vascular bundles
6. and are surrounded by mesophyll cells
7. This is called kranz anatomy
8. Mesophyl cells and bundle sheath cells are
9. tightly interconnected to each other
10. by high number of plasmadesmata
11. As Rubisco work more efficiently
12. It can operate under high C_4 concentration
13. Chloroplast in mesophyl cells are different in anatomy in comparison to chloroplast of bundle sheath cells.
14. chloroplast of mesiphyl cells are rich in grana
15. They are large and highly differentiated for light reaction
16. Bundle sheath chloroplast possess a very few less differentiated grana or
17. grana are absent
18. PS II in bundle sheath cells are depleted
19. only cyclic electron flow of light reaction occur in bundle sheath cells.
20. there is lower oxygen production
21. In bundle sheath cells Co_2 fixation has improved by preventing the gateways for photorespiration

any 38 x 4 = 150

(02) (i)

1. Root hairs absorb the soil solution, which consist of water molecules and dissolved mineral ions that are not bound tightly to soil particles.
2. Water can enter root hair by osmosis, passive movement along the concentration gradient
3. Mineral ions transport occurs against concentration gradient, by an active transport
4. Soil solution absorbed in to hydrophilic walls of epidermal cells.
5. and pass freely along the cell walls and the extra cellular spaces in to root cortex
6. Transport of water and minerals entered from soil to roof cortex in to xylum of rot is called radial transport.
7. The endodermis functions as the last check point for selective passage of the minerals from the cortex in to vascular cylinder.
8. Three routes are used in radial transport.
9. Apoplastic route
10. Symplastic route
11. transmembrane route
12. water and solutes move along continum of the cell walls
13. and extracellular spaces
14. uptake of soil solution by he hydrophilic walls of root hairs provide access to the apoplast.
15. water and minerals diffuse into cortex along this matrix of walls and extra cellular spaces
16. Endodermis block apoplastic route by casuparian stripes
17. water and minerals cross the plasma membrane before entering the vascular tissue
18. and keep unneeded and toxic materials out
19. Symplast consist of the entire mass of cytosole of all living cells, plasmodesmata and cytoplasmic channels interconnect them
20. In symplastic route, water and solutes move along the continum of cytosol.
21. This route requires substances to cross a plasma membrane once, first enter the plant.
22. After entering one cell, substances can move from cell to cell via plasmadestrata
23. Transmembrane roule requires repeated crossing of plasma membrane
24. As water and solutes exit one cell and enter the next
25. As the soil solution moves along the apoplast, some water and minerals are transported in to the protoplast of the cells of the epidermis and cortex adn then move via the symplast
26. Some substances are use more than one route
27. The least resistence for the transport is in apoplastic route
28. Water and minerals enter into the tracheid and vessel elements of xylem.

(ii)

1. During the day time, the guard cells actively accumilate K^+ from heighboring
2. epidermal cells
3. It lowering their water potential and
4. leads to the inflow of water by osmosts from the surrounding epidermal cells.
5. As a result turger pressure in guard cells increase and opening stomata
6. When K^+ loss from quard cells to neighboring epidermis.
7. it leads to exosmosis of water from guard cells
8. As a result the turgor pressure in guard cells decrease and close the stomata
9. ABA is produced in roots and leaves in response to water deficiency
10. ABA leads to close the stomata by removal of K^+ in guard cells.

$28 + 10 = 38$

$38 \times 4 = 152$

Marks = 150

(03) 1. The normal body temperature of man is 37^0C (36.5^0C - 37.5^0C)
2. Human body temperature is controlled by negative feed back mechanism
3. Body's temperature control centre in hypothalamus
4. respond to temperature increase or decrease
5. by activating heat loss mechanism or
6. heat gain mechanism until the body temperature reaches the present level
7. when person is in hot surrounding high peripheral temperature is detected by warm receptors in the skin
8. High deep body temperature is detected by hypothalamic temperaturesensitive nerve endings
9. these nerve impulses area sent to the body's temperature control in hypothalamus
10. when increase in body temperature above the present level
11. thermostat in the hypothalamus sent impulses
12. to activate heat loss mechanism and inhibit heat gain mechanism
13. As a result dialate the blood vessels in the skin cause filling of blood capillaries with warm blood.
14. and radiating heat from the skin surface
15. increase sweat secretion from the sweat glands
16. It promotes heat dissipation through evaporative cooling
17. when body temperature is within the normal range again
18. warm temperature sensitive receptors are no longer stimulated
19. and send signals to hypothamic thermostat stop
20. due to negative feedback mechanism
21. then additional heat hoss mechanisms stop and
22. blood flow to the peripheries return to normal
23. low peripheral temperature (when it cold surrounding) is detected by cold receptors in the skin
24. low deep body temperature is detected by temperature sensitive nerve endings in hypothalamus
25. these nerve impluses are sent to the body's temperature control centre in hypothalamus
26. thermostat in hypothalamus sends impulses to activate heat gain mechanism
27. and inhibit heat loss mechanism
28. thereby increasing the body temperature until the present point
29. to increase body temperature, constrict blood vessels in the skin
30. and divert the blood from skin to deeper tissues and
31. reduce heat loss through the skin surface
32. shivering
33. rapid repetitive contractions of skeletal muscles to generate heat
34. contracting hair erector muscle to generate heat to some extent
35. when body temperature return to normal range the cold temperature sensitive receptors are no longer stimulated
36. and their signals to the hypothalamic thermoslat stop
37. due to negative feedback mechanism
38. then additional heat generating mechanisms in the body stop
39. blood flow to the peripheries returns normal

marks 38 x 4 = 150

(04) (i) 1. Genes located on the sex chromosomes
2. are called sex linked genes
3. characters expressed by those genes are sex-linked characters
4. genes carrying by X chromosome are called X-linked genes
5. genes carrying by Y chromosomes are called Y-linked genes
6. Y chromosomes carry only few genes (other than those related to)

7. Some disorders carried on the Y - linked genes
8. are transformed only through male progency
9. eg.: absence of certain Y - linked genes causes inability to produce normal sperms
10. In addition to sex related characters, X- chromosomes carry many other characters
11. eg.: Rd green color bindness
12. Haemophilia - X - linked recessive disorder
13. Where one or more of the proteins required for blood clotting are absent
14. So they are in arisk of server bleeding
15. due to the delay in clot formation
16. This allel is located in X chromosome which is not homologous region
17. So there is no relevant allel in Y chromosome
18. One X^n chromosome is adequate to being a hemophilian male
19. but to a hemophilian female need two X^n allels
20. getting two allels is lower than getting one allel and as a result
21. hemophilia is rare among female

(ii) 1. Plant and animal breeding helps to enhance the value of food by improving their nutritional quality.
2. many essential vitamins add to the rice.
3. plant breedings is useful in reducing toxic components and making them safer to eat
4. Alkaloids in yam / cynogenic glucosides in manioc, tripsin inhibitors in pulses
5. Is also useful in traking some plant products more digestible
6. to supply foor required for he wild population growth
7. plant breeding has produced super rice which has 50% more fields, super wheat which boost the harvest by 20-40%.
8. To adapt environmental stresses.
9. develop new plant types can resists various biotic stresses / diseases and insect pest abiotic stresses / produce new plant varieties resistant to salt, drought, cold stresses
10. et.: pest resistant cotton / maize / potatoes which carry BT toxin.
11. Crop plants and farm animals with increased immunity.
12. To satisfying industrial and other end - use requirements.
13. Different varieties are being developed by breeders fo booking, cooking, fries, chipping and for starch
14. Seedless fruits such as grapes, melon, strawberries
15. Depending on end-use requirements, it is possible to develop quality added products using animal and plant breeding techniques
16. To develop animal and plant varieties with aesthetic values
17. Develop new varieties that exhibit new flowers / leaf colours, attractive shapes
18. Selective breeding for numerous morphological features and functional abilities
19. have given rise to nearly 400 dog breeds / 50 rabbits / bird varieties

Marks = 38 x 4 = 150

(05) (i) 1. Main factors for decertification are climatic variations
2. human activities
3. Deforestation
4. over - exploitation of water and soil
5. uncontrolled mining and excessive use of
6. agro - chemical products
7. poor land management
8. It deciease ecosystem services and
9. reduced bio - diversity in affected areas
10. decreasing of vegetation cover induce water scarcity
11. destroys habitats of animal and plant species
12. reduces agricultural activities mainly the growth of crop special
13. If affect to the food security of the people as well as for animals
14. Desertification present a serious impact on human well-being and
15. health of the people living in the areas affected by droughts and land degradation
16. carbon storage capacity of plants and soil also reduced in the long run

(ii) 1. Habitat loss
2. when natural habitats are converted into other human uses such as agriculture or build up area
3. they are no longer able to support the species present in the original habitat
4. this result in the displacement or destruction of bio-diversity
5. eg.: deforestation / filling of wetlands
6. overexploitation
7. harvesting or exploiting biodiversity products in a manner
8. and a rate which it cannot recover within the periods of exploitation
9. leads to danger of bio-diversity being completely lost
10. over collection of plant kotolahimbutu for export / export of sea cucumber for medicinal purposes / Kaluwara
11. Pollution
12. cutrophication resulting in algal blooms and it create oxygen depleted zone
13. greatly reduce the populations of fish and other aquatic species
14. uses of synthetic fertilizers for tea has resulted pollution of rivers and affecting the water quality fand making it unsuitable for human use
15. releasing of SO_2, N_2O gases resulting acid rains, acid rains contributes to death of trees, killing many buds
16. introduction of invasive alien speeics
17. invasive alien plants spread outside their natural geographical range when lead to extinction
18. they can transport diseases
19. complete with native species and remove them
20. alter food chains
21. decrease bio-diversity
22. change ecosystem properties by altering soil composition
23. Lantana / Gadapana
24. Climatic changes

25. Many species will not be able to adapt themselves fast enough to keep up with the comming changes diving them to extinction.
26. Warming of the past resulted ecological changes / growing sections ..... any 38 x 4 marks = 150

(06) (i) 1. In vitro fertilization (IVF)
2. is a series of procedures used to treat infertility problems
3. and assist with the conception of a child
4. process involves removal of oocyte from a female ovary and combining with a sperm to achieve the fertilization under laboratory conditions.
5. fertilized egg incubated until reach at least 8 cells.
6. then this embryo transferred to a woman's uterus for implantation
7. conventional IVF needs between 50-100 thousands of sperms per one oocyte for fertilization
8. Intra - cyto plasm'c sperm injection
9. type of in vitro fertilization method
10. used to address male infertility
11. if mature sperms are defective or low in number
12. A whole sperm or a spermatid nucleus
13. is injected directly into the cytoplasm of an oocyte removed from ovary
14. need one sperm per oocyte
15. sperm which inserted in to oocyte is already selected
16. fertilized eff returned to the women's uterus for implantation

(ii) 1. They are terrestrial
2. major decomposers and some are symbionts
3. filamentous with septa
4. dikaryotic stage is dominant
5. produce fruiting body basidiocarp is sexual reproduction
6. produce basidia on the gills of basidiospores
7. Produce basidiospores on basidium
8. basidiospores are exogenous

(iii) 1. Life cycle has four stages, they are eggs, larva, pupa and adults
2. Aedes aegypti
3. Aedes albopictus
4. Adult female mosquito lays eggs single on the inner surface of wet containers above the water level
5. preferably clear water
6. Initially the laid eggs are white in colour and become shiny black colour within few minutes from deposition of eggs
7. eggs are smooth, long and ovoid in shape and 1mm long.
8. Eggs hatch within two days to become a larval
9. the larval rest with an angle to the water surface
10. If the eggs are not hatched, they can undergo dormant for a period of about six months
11. The body of larva consists of three major parts head, thorax and abdomen
12. After 4-5 days the larval stage becomes the pupa which is comma shape and mobile
13. The pupa becomes the adult mosquito within 1-2 days. for 37 point extra

37 x 4 = 148 + 2 = 150

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| කෙටි සටහන් | පසුගිය ප්‍රශ්න පත්‍ර | වැඩ පොත් | සඟරා | O/L ප්‍රශ්න පත්‍ර | A/L ප්‍රශ්න පත්‍ර | අනුමාන ප්‍රශ්න පත්‍ර | අතිරේක කියවීම් පොත් | School Book | ගුරු අත්පොත්

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පෙර පාසලේ සිට උසස් පෙළ දක්වා සියළුම ප්‍රශ්න පත්‍ර,
කෙටි සටහන්, වැඩ පොත්, අතිරේක කියවීම් පොත්, සඟරා
සිංහල සහ ඉංග්‍රීසි මාධ්‍යයෙන් ගෙදරටම ගෙන්වා ගැනීමට

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