



සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Sabaragamuwa Provincial Department of Education



තෙවැනි වාර පරීක්ෂණය - 13 ශ්‍රේණිය - 2025
3rd Term Test – Grade 13 – 2025

Biology - I

09

E

I

Time : 02 Hours

Instructions:

- Answer all the questions.
- Select the correct or most appropriate answer.

01. Select the compound that pentose does not contain as a component.

1. ATP 2. Inulin 3. Hemicellulose 4. NAD⁺ 5. RuB

02. What is the correct answer regarding the hierarchical levels of organization of living things?

- | | | | |
|------------------|-------------------|---------------------|------------------|
| 1. Chlorophyll | → Chloroplast | → xylem | → plant leaf |
| 2. Lipids | → Cell wall | → Parenchyma cell | → xylem |
| 3. Carbohydrates | → peroxisome | → Hepatocytes | → Liver |
| 4. Cholesterol | → plasma membrane | → Epithelial tissue | → skin |
| 5. Protein | → Nucleus | → mast cell | → Areolar tissue |

03. Select the correct statement.

1. Phospholipids are composed of one fatty acid and two phosphate groups attached to one glycerol molecule.
2. rRNA is the most abundant type of RNA in the cell and it has a complex regular structure.
3. One complete turn of the DNA double helix has 20 bases.
4. Chitin is a component of the Algae cell wall and exoskeleton of Arthropods.
5. Genetic information of Eukaryotes is stored in mRNA in the Nucleus.

04. Select the incorrect statement regarding the microscope.

1. In a compound microscope total magnification is calculated by the magnification of the objective lens * magnification of the eyepiece lens.
2. One of the disadvantages of the electron microscope is that it is unable to observe live specimens.
3. In a scanning electron microscope some of the electrons that fall onto the specimen are absorbed.
4. In a light microscope resolution power and magnification are 0.2 μm and 1×10^5 respectively.
5. Very thin specimens are used in the transmission electron microscope.

05. Select the answer that states the subcellular component and its function correctly.

1. Rough endoplasmic reticulum – Produces the cell wall
2. Golgi apparatus – Detoxification
3. Cytoskeleton – provides strength to the cell wall
4. Glyoxisome – photorespiration
5. Central vacuole – helps in digestion



06. Which statement/ statements given is /are the correct regarding cell division?
- (a) At the end of telophase in mitosis, two genetically identical daughter cells are produced.
 - (b) In meiosis, during the synapsis part of the non sister chromatids of paired homologous chromosomes break, exchange and rejoin at a corresponding point.
 - (c) Genetic variation occurs due to crossing over, recombination and natural selection.
 - (d) During anaphases I in meiosis I homologous pair of chromosomes separates.
- (1) b, d (2) a, b, d (3) a, b (4) a, c (5) c, d
07. Correct regarding the role of the enzyme in regulating metabolic reactions,
- (1) Enzyme reduced the rate of reaction at the different pH ranges other than its optimum pH value due to alteration of the active site of the enzyme.
 - (2) Most enzyme needs cofactors to catalyse the reaction.
 - (3) When the temperature of the reaction medium is increased, enzyme reactions tend to increase continuously.
 - (4) The action of competitive inhibitors can be reversed by increasing the substrate concentration.
 - (5) The molecules that regulate enzyme action naturally are reversible inhibitors.
08. Consider the characters given below.
- (a) Some of the hydrocarbons in membrane lipids are branched.
 - (b) No histone proteins associated with DNA.
 - (c) Introns are present in some genes.
 - (d) Having several kinds of RNA polymerase.
- Select the correct answer in order of organisms showing these characteristics.
- (1) *Nostoc*, *Methanococcus*, *Anabaena*, Yeast
 - (2) *Halobacterium*, *Anabaena*, *Methanococcus*, *Planaria*
 - (3) *Halobacterium*, *Nostoc*, *Anabaena*, *Thermococcus*
 - (4) *Thermococcus*, *Nostoc*, *Salmonella*, *Planaria*
 - (5) *Anabaena*, *Thermococcus*, *Nostoc*, *Penicillium*
09. Given is a character possessed by organisms in the kingdom Protista, 'multicellular plant-like thallus'. What are the other characters possessed by this organism?
- (a) Greenish red in colour.
 - (b) Cell wall is made up of cellulose and alginic acid.
 - (c) Storage food is Laminarin.
 - (d) Photosynthetic pigments are chlorophyll a and d.
- (1) a, c and d (2) b and c (3) a and c (4) a, b and c (5) a and d
10. Incorrect statement regarding the diversity of terrestrial plants,
- (1) Club mosses are homosporous and spike mosses are heterosporous.
 - (2) Because the seed plan is retained within the sporangia of the sporophyte, it can protect itself from environmental stress.
 - (3) The seeds produced by Gnetophyta look like the fruits of angiosperms.
 - (4) In Angiosperms, fertilization triggers the hormonal changes that causes the ovary to form a fruit.
 - (5) Dicotyledonous plants the pollen has two openings.
11. Select the unmatched answer about animal phylum and their characteristics.
- (1) Phylum Arthropoda – Cutinous exoskeleton (2) Phylum Annelida – parapodia and setae
 - (3) Phylum Nematoda – sensory papillae (4) Phylum Mollusca - mantle
 - (5) Echinodermata - papulae



12. Select the correct statement regarding the plant tissue.
- (1) Epidermis consists of several layers of cells which are arranged tightly.
 - (2) In all vascular plants water and minerals are transported by vessel elements.
 - (3) Sclereids are found in plant parts where growth has stopped.
 - (4) Collencyma cells are flexible and give mechanical support to roots.
 - (5) Companion cells are not found alongside each sieve tube element.
13. Growth and development process of a plant,
- (1) The pericycle of a monocot root has a meristematic function.
 - (2) Due to the activity of the apical meristem, plants increase their length and diameter.
 - (3) Cork cambium is produced by the outer layer of the cortex of the root of a dicot plant.
 - (4) During the secondary growth, vascular rays are produced by shorter initials of the vascular cambium.
 - (5) New cells are necessary to produce the periderm, which is produced by the vascular cambium.
14. Due to a deficiency of which elements the following symptoms appear respectively,
- (1) Mo and Mn (2) Mg and Fe (3) Mg and S (4) Ni and Mn (5) Mo and Fe
15. Select the incorrect statement,
- (1) In dicot leaves, stomata are mainly found in the lower epidermis.
 - (2) Decrease in CO₂ concentration in the substomatal cavity leads to open stomata.
 - (3) In still air number of diffusion shells is found around a leaf.
 - (4) During the guttation, water leaves from plant leaf as droplets through the hydathodes.
 - (5) Vertically arranged leaves are important for obtaining more light.
16. Choose the correct statement concerning how plants respond to stimuli.
- (1) Cryptochromes photoreceptor participate in seed germination.
 - (2) The shoot of the plant grows downward due to its response to gravity.
 - (3) The directional growth of a tendril towards support is called thigmotropism.
 - (4) Exposure to direct sunlight stimulates branching and vertical growth.
 - (5) Most molecules that are considered plant hormones act locally.
17. Incorrect information regarding the plant's responses to certain biotic and abiotic stresses.
- (1) To prevent freezing plants increase cytoplasmic levels of specific solutes such as sugar.
 - (2) For defence from pathogens plants having thorns, prickles and trichomes.
 - (3) For salt stress, excess salt is sent out of the plant through the salt gland across the leaf surfaces and stems.
 - (4) As for responding to drought, in grass the leaves roll into a tube-like shape to reduce surface area.
 - (5) The structure of the epidermal cell wall and its thickness are important for defence from pathogens.
18. What is the correct response that indicates the tissues or cells and their respective functions?
- | | |
|-------------------------------|------------------------------|
| A - Epithelial tissue | P - thermal insulation |
| B - Mast cell | Q - secretion |
| C - Adipose tissue | R - Provide tensile strength |
| D - Fibrous connective tissue | S - Active absorption |



E - Intestinal lining epithelium

T - Secreted heparin and histamine

(1) A - T, C - S, B - P, D - R, E - T

(2) A - Q, B - T, C - P, D - R, E - S

(3) A - R, B - P, D - R, E - S, C - T

(4) D - R, B - P, C - P, A - Q, E - Q

(5) A - Q, B - T, C - T, D - P, E - S

19. Select the correct statement regarding the vitamins.

(1) Anaemia occurs due to a deficiency of Niacin and Cobalamin.

(2) Reduction of heart function due to a deficiency of Biotin.

(3) Vitamin K is used for collagen synthesis.

(4) Immunity impairment due deficiency of antioxidant vitamins.

(5) Vitamin B is a component of coenzymes such as FAD.

20. Choose the correct statement regarding the cardiac cycle.

(1) Atrioventricular valves are open only during atrial systole.

(2) Blood returned to the ventricles during the ventricular systole.

(3) Some blood flows to the atrium from the ventricles during ventricular systole.

(4) The SA node gets stimulated when blood flows into the atrium during Atrial systole.

(5) Ventricular systole takes place when contraction waves sweep downward through the ventricular wall.

21. During human respiration,

(1) Increased pH level in the cerebrospinal fluid due to exercising is detected by the sensors in the aorta.

(2) The breathing control centre of the human is located in the pons of Veroli.

(3) Volume of the thoracic cavity reduces due to contractions of the diaphragm during exhalation.

(4) The sensors important for detecting lower O_2 concentration in blood are found in the aorta and the pulmonary artery.

(5) During inhalation air is pulled into the lungs.

22. Select the incorrect statement regarding the innate immunity.

(1) Histamine and cytokines act as signaling molecules in inflammatory responses.

(2) Tears provide a continuous washing action and prevent settling microbes on the eye.

(3) Complement proteins are a type of inactive protein found in blood and cytoplasm.

(4) Nitrophils and Macrophages are two types of phagocytic cells in man.

(5) Interferons are secreted by virus-infected cells.

23. Choose the correct statement regarding the process of urine formation.

(1) The filtrate becomes more diluted as it passes through the proximal convoluted tubules.

(2) At the descending limb of the loop of Henle, water is reabsorbed passively and a considerable amount of NaCl is reabsorbed actively.

(3) Na^+ concentration of urine can be increased due to the inhibition of the secretion of Aldosterone.

(4) Dilute urine can be produced in the presence of ADH.

(5) When producing dilute urine, salt is actively reabsorbed at the kidneys.



24. Identify the primary brain structure responsible for the specified functions.
- a - Coordinates voluntary muscular movements
 - b - Initiation and control of voluntary muscle contractions
 - c - Regulate appetite
 - d - Control involuntary reflexes
 - e - Coordinates auditory and visual reflexes
- (1) Cerebrum, Cerebellum, Hypothalamus, Medulla oblongata, Midbrain
 - (2) Cerebellum, Cerebrum, Hypothalamus, Medulla oblongata, Midbrain
 - (3) Cerebellum, Cerebrum, Medulla oblongata, Hypothalamus, Midbrain
 - (4) Midbrain, Hypothalamus, Cerebrum, Cerebellum, Medulla oblongata
 - (5) Medulla oblongata, Cerebrum, Hypothalamus, Cerebellum, Midbrain
25. Correct regarding Autonomic Nervous System.
- (1) In the sympathetic division, the gallbladder is stimulated, while in the parasympathetic division, its action is inhibited.
 - (2) Parasympathetic nerve impulses inhibit the emptying of the bladder.
 - (3) Food digestion and absorption are stimulated by the parasympathetic division.
 - (4) Sympathetic division secretes epinephrine.
 - (5) Sympathetic division returns the body to its self-maintained position.
26. Choose the correct statement regarding the resting potential of a neuron.
- a - The K^+ concentration is high in the outside while the Na^+ concentration is high in the outside.
 - b - More leaky potassium channels open than sodium channels.
 - c - Transport three Na^+ into the cell for each two K^+ .
- (1) Only a, b, c
 - (2) Only a and b
 - (3) Only a and c
 - (4) Only c
 - (5) Only b
27. Select the incorrect statement regarding the sensory receptors.
- (1) Krause end bulbs detect the coldness of the body surface.
 - (2) In the cones, visual pigment is photopsin.
 - (3) Meissner corpuscles sensitive to light pressure are present close to the surface of the skin.
 - (4) Pacinian corpuscles which are present close to the surface of the skin are a kind of vibration receptor.
 - (5) Free nerve endings detect both cold and warmth.
28. The following are some responses related to increasing body temperature regarding the homeostasis regulations of body temperature select the correct statement.
- (1) High deep body temperature detected by cold receptors in the skin.
 - (2) Secretes thyroid hormone into the blood.
 - (3) Heat dissipation through evaporative cooling.
 - (4) Promoting heat conservation and the heat gain mechanism.
 - (5) Dilating of blood vessels in the skin which divert the blood to deeper tissues.



29. Correct regarding the hormonal control of the human female reproductive cycle.
- (1) At the beginning of the follicular phase, the anterior pituitary secretes large amounts of FSH and LH hormones.
 - (2) At the 14th day of the ovarian cycle LH level surges.
 - (3) The luteal stage starts before ovulation.
 - (4) The secretory phase of the menstrual cycle starts after ovulation.
 - (5) When LH secretion increases in the ovarian cycle progesterone levels increase in the uterine cycle.
30. Correct regarding the upper and lower limb human skeleton.
- (1) Upper limb adapted for movement through a wide range and bearing bodyweight.
 - (2) The shoulder joint is a complete ball-and-socket joint.
 - (3) Arches of the foot are important for the distribution of the weight of the body evenly throughout the foot.
 - (4) The humerus is the strongest bone of the body.
 - (5) The tibia and fibula join with the patella to form the knee joint.
31. Not the importance of plant and animal breeding,
- (1) Developing animal and plant varieties with aesthetic values.
 - (2) Satisfying industrial and other end-use requirements.
 - (3) Addressing world food and feed quantity needs.
 - (4) Need to adapt to environmental stress.
 - (5) Produce super rice that has 20 – 40 % more yield compared to the normal rice.
32. A population with 1000 flowers has 1600 alleles for red flowers and 400 alleles for white flowers. What is the percentage of heterozygote organisms in this progeny?
- (1) 16 % (2) 32 % (3) 8 % (4) 64 % (5) 20 %
33. What is the correct sequence of steps for making recombinant DNA molecules?
- a - Separation of DNA fragments by gel electrophoresis.
 - b - Isolation of DNA from different sources.
 - c - Identification of the correct fragment with the desired nucleotide sequence using a probe.
 - d - Restriction digestion of isolated DNA with a restriction enzyme.
 - e - Joining the DNA fragments from multiple sources using DNA ligase.
- (1) a, b, d, c, e (2) b, d, c, a, e (3) a, c, b, d, e (4) b, d, a, c, e (5) b, d, a, e, c
34. Not include in PCR mixture,
- (1) Two RNA primers (2) Mg^{2+} ions (3) DNA polymerase enzyme
 - (4) dNTP (5) A single standard template
35. Select the correct statement.
- (1) Non-coding sequences within a gene are called exons.
 - (2) Gene is the basic functional and structural unit of heredity.
 - (3) An operon comprises a control region and structural genes that are transcribed into one mRNA.
 - (4) The architecture of a chromosome is the way the DNA molecules are arranged in the nucleus.
 - (5) Lightly packed chromatin is called Heterochromatin.



36. Incorrect regarding the biome,

- (1) Alpine tundra occurs at high altitude arctic tundra occurs at high latitude.
- (2) The average temperature of tropical rain forest is $25 - 29^{\circ}\text{C}$ and the annual rainfall is about 1500 – 3000 mm.
- (3) A vertical layering (stratification) can be seen in a temperate broadleaf forest.
- (4) In temperate grasslands, during the winter season the average temperature falls below -10°C and in summer it is about 30°C .
- (5) Dwarf forest and shrubs are a feature of Chaparral.

37. Not an environmental service value of biodiversity,

- (1) Carbon dioxide fixation through photosynthesis
- (2) Soil formation
- (3) Protection from erosion
- (4) Pollination
- (5) Regulating moisture in the atmosphere

38. Correct regarding the microorganisms,

- (1) The naked RNA in viroids do not contain any gene.
- (2) Some viruses contain the reverse transcriptase enzyme for reverse transcribing DNA to RNA.
- (3) Mollicutes produce spores during sexual reproduction.
- (4) Staphylococcus arrangement of bacteria formed by cell division in one plane.
- (5) Nucleic acid in prions encodes for the prion protein.

39. Coliforms are a type of bacteria used as an indicator to test drinking water quality, not a characteristic of these bacteria.

- (1) Aerobic or facultative anaerobic
- (2) Forming endospores
- (3) Gram - negative
- (4) Ferment lactose
- (5) Rod shape

40. Choose the **incorrect** statement regarding aquaculture.

- (1) Cultured species should tolerate high population density and grow well.
- (2) Selected species should withstand the climate of the region in which it is cultured.
- (3) If selected species show relatively late sexual maturation, it is advantageous.
- (4) If maintaining home aquarium fish should feed everyday.
- (5) Selected species should be an efficient converter of economical foodstuffs.

- For each of the question 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
Only A, B and D are correct	Only A, C and D are correct	Only A and B are correct	Only C and D are correct	Any other response or combination of responses are correct



41. Select the correct statement/ statements regarding photosynthesis.
- (A) Chloroplasts in mesophyll cells of C_4 plants differentiate for light reactions.
 - (B) The flow of electrons in one direction through the photosystem and other molecular component is called cyclic electron flow.
 - (C) 1, 3 – Bisphosphoglycerate will be reduced to G3P through step-by-step.
 - (D) PEP carboxylase is more effective than Rubisco enzyme.
 - (E) In the C_4 mechanism, decarboxylation occurs in mesophyll cells.
42. Select the characteristics feature/ features of the phylum Cordata.
- (A) The muscular tail that extends posterior to the anus present in the embryonic stage is reduced in most terrestrial adults.
 - (B) Cloaca is a common chamber with a single pore open to the external environment that is found in osteichthyes.
 - (C) Amphibian having thick moist skin with glands.
 - (D) Birds having colour vision.
 - (E) Reptilia lay calcareous-shelled eggs.
43. Correct about water potential,
- (A) Water potential decreases in pure water when adding solutes.
 - (B) In a fully turgid cell solute potential is equal to the pressure potential.
 - (C) The pressure potential of a living cell may be positive or negative.
 - (D) In a fully flaccid cell the pressure potential is zero.
 - (E) It has positive effects on water potential as the solute concentration increases.
44. What is/are the statement/ statements considered as true regarding the excretory of animals.
- (A) Malpighian tubules are blind end tubules immersed in hemolymph and open into the digestive tract.
 - (B) In Nephridia one end of the tubules is open to the coelom while the other end opens to the digestive tract.
 - (C) Green glands are the excretory organs of Crustaceans.
 - (D) Salt glands are important for excreting excess salt.
 - (E) In vertebrate skin, sweat glands open to the skin surface through sweat tubules.
45. Choose the **incorrect** statement/ statements,
- (A) Human immunodeficiency virus is transmitted from mother to the fetus during pregnancy.
 - (B) The degenerative non-inflammatory disease that occurs in the bone is called osteoarthritis.
 - (C) During Type 1 Diabetes mellitus, the immune system attacks the Alpha cells in the islets of Langerhans.
 - (D) The progressive motor disorder that leads to the nature of Parkinson's disease.
 - (E) Confusion and memory loss are characteristics of Depression.

46. Choose the true statement/ statements.
- (A) X and Y are sexual chromosomes that always provide code for different characters.
 - (B) A population that is not evolving deviate massively from the Hardy-Weinberg Equilibrium.
 - (C) Straight thumb is dominant and the attached earlobe is a recessive character.
 - (D) Test cross is a deliberate breeding process performed to determine an unknown genotype.
 - (E) The alleles that are located in different chromosomes and are located in the same locus have the same sequence of nucleotide.
47. Properties of the genetic codon,
- (A) 61 triplets code for 20 amino acids.
 - (B) Three-letter words (triplet) are read one after the other.
 - (C) UGA, AUG, UAA are terminating codons.
 - (D) All organisms nearly share the same genetic code.
 - (E) There are spaces to limit codon.
48. Ecosystems that are found in the intermediate zone of Sri Lanka,
- (A) Tropical sub-mountain forest
 - (B) Wet pathana
 - (C) Tropical moist evergreen forest
 - (D) Dry pathana
 - (E) Damana and Thalawa
49. Correct statement regarding the micro-organisms,
- (A) The majority of Methane is produced by ocean sediments consumed by micro-organisms called Methanotrophs.
 - (B) *Bacillus* and *Agrobacterium* are the most common organisms found in the Rhizosphere.
 - (C) Insulin is cheaply produced by using genetically modified *E. coli*.
 - (D) Polysaccharide gum produce by some micro-organisms important for formation of stable soil-aggregates.
 - (E) *Lactobacillus bulgaricus* add creamy texture to the yoghurt.
50. Disease caused by ornamental fish due to bacteria,
- (A) Hemorrhagic septicaemia
 - (B) Columnaris diseases
 - (C) Ich diseases
 - (D) Gill and skin infection
 - (E) Trichodinosis



සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
Sabaragamuwa Provincial Department of Education



තෙවැනි වාර පරීක්ෂණය - 13 ශ්‍රේණිය - 2025
3rd Term Test – Grade 13 – 2025

Biology - II

09

E

II

Time : 03 Hours

Part A – Structured Essay

- Answer all the questions on this paper itself.
- Write you answer in the space provided for each question. Note that the space provided is sufficient for your answers and that extensive answers are not expected.

Part B – Essay

- Answer four questions only. Use the separate papers for this purpose. At the end of the time allocated for this paper, tie the two papers together so that Part A is on top of Part B before handing it over to the supervisor.
- You are permitted to remove only Part B of the question paper from the Examination hall.

For the use of the examiner only.

Part	Question No.	Marks
A		
B		
Total		
Precentage		

Paper I	
Paper II	
Final Mark	



Part A – Structured Essay

01. (A) (i) (a) What was the nature of the first organism that formed on Earth.

.....

(b) What is sustainable food production?

.....

.....

(ii) (a) Write two important aspects of water for the existence of life.

.....

.....

(b) Write the steps of the experiment that were done for testing the reduction of sugar.

.....

.....

.....

(iii) (a) Name branched structural polysaccharide.

.....

(b) Write the base pair rule when forming nucleic acids.

.....

.....

(iv) (a) Explain the structural nature of the genetic materials of prokaryotic cells.

.....

(b) Write the location of organelles in a eukaryotic cell.

.....

(v) (a) Write the structural difference between microtubules and microfilaments (actin filament).

.....

.....

(b) What are the cell junctions.

.....

(c) Write the function of gap junctions/ communication junctions.

.....

.....

(B) (i) (a) Which phase of the eukaryotic cell cycle does DNA replication take place in?

.....

(b) What is the importance of mitotic cell division in asexual reproduction?

.....

(c) Write the difference between metaphase I and metaphase II in meiosis.

.....

.....

.....

(ii) (a) Why ATP is called a mobile molecule?

.....
.....

(b) What is oxidative phosphorylation?

.....

(iii) (a) Write an important of feedback inhibition.

.....

(b) Name an inorganic cofactor.

.....

(iv) (a) What is the absorption spectrum of photosynthesis?

.....
.....

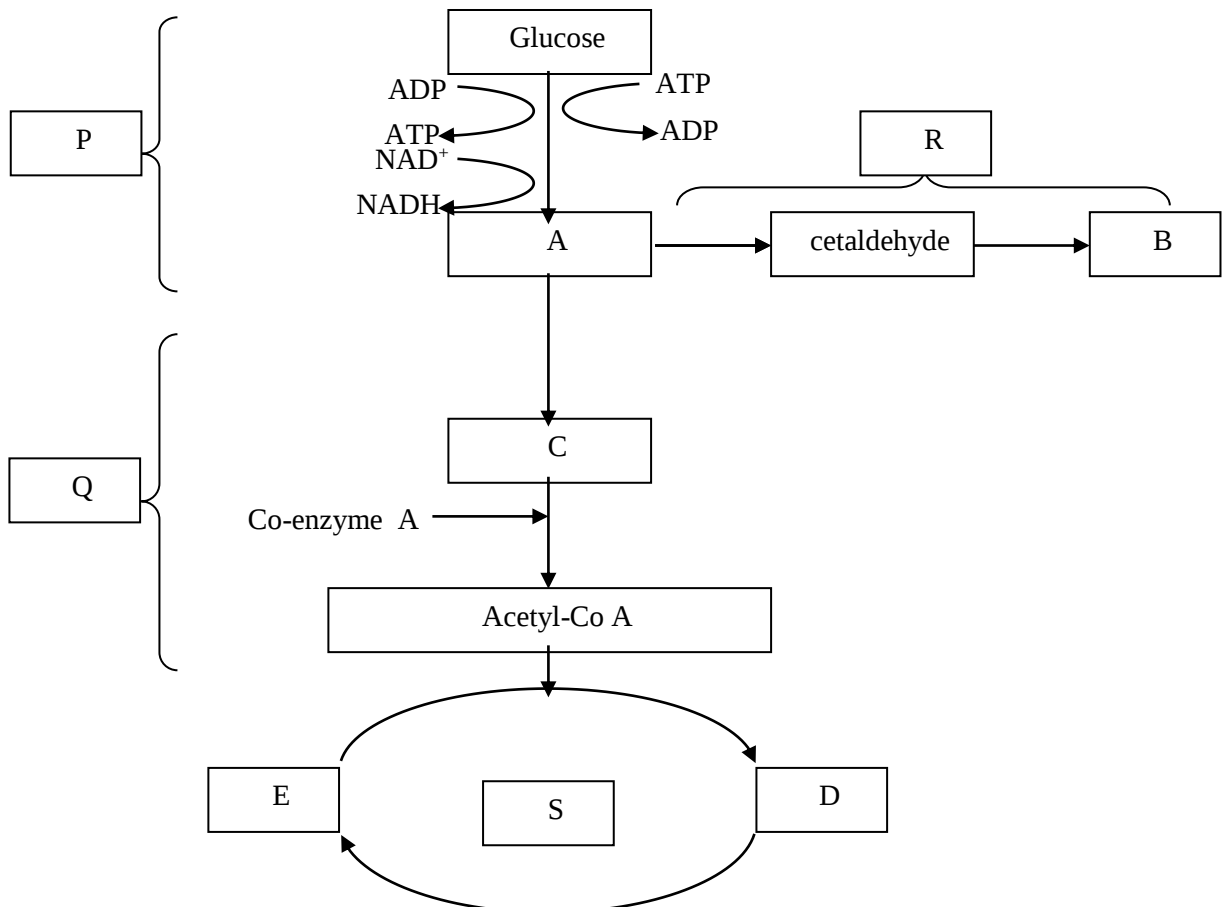
(b) What makes PEP more effective than Rubisco in the process of CO₂ fixation.

.....

(v) What is the reason for decreasing the rate of photosynthesis during low light intensities?

.....
.....

(C) Write the answers using the given flow chart.





(i) (a) Identify the steps represented by letters P, Q, R and S.

P
Q
R
S

(b) Identify two reactions in which decarboxylation takes place in the above chart.

.....
.....

(c) Name the step where NADH oxidation takes place.

.....

(ii) Why is a test tube containing KOH used during the experiment to measure the respiration rate of germinating green gram seeds with a respirometer.

.....

(iii) (a) What is the age of the oldest eukaryotic fossil.

.....

(b) Write the two principles of the Theory of Lamarck.

.....
.....

(iv) (a) Name the non-vascular plant phylum that shows more relative features for vascular plants.

.....

(b) Name two vascular plant groups that show homosporous.

.....

(v) (a) What is an ovule.

.....

(b) Name the fungal phylum that produces motile spores.

.....

02. (A) (i) (a) Write the function of the clitellum possessed by the organisms in the phylum Annelida.

.....

(b) What is the radula in the phylum Mollusca?

.....

(c) Name two respiratory structures found in terrestrial Arthropods.

.....
.....



(ii) (a) Write the nature of the skeleton of Echinodermata.

.....

(b) Write a difference between the skin of Amphibians and Reptiles.

.....

(c) Write a unique character of Class Aves.

.....

(iii) (a) Write a function of the intercalary meristem.

.....

(b) What are the structures of the cell that change during the differentiation process?

.....

.....

(iv) When observing a plant part under the microscope, elongated cells with unevenly thickened cell walls can be seen.

(a) Identify what type of cell that is.

.....

(b) Write the functions of the above type of cells.

.....

(B) (i) (a) Write the function of tissue produced by the short initials of the vascular cambium.

.....

(b) Write the environmental stress conditions that caused close stomata during the day daytime.

.....

(ii) What are the steps taking place during seed germination?

.....

.....

.....

.....

(iii) (a) What is thigmomorphogenesis?

.....

(b) Name a type of plant that shows thigmonasty.

.....

(iv) Name plant growth substances that do the following functions.

(a) Promote roots and root hair formation



- (b) Promotes the formation of lateral and adventitious roots
.....
- (C) (i) Write the functions of the given cells and fibres of connective tissue.
- (a) Fibroblasts -
- (b) Reticular fibres -
- (ii) (a) Name the repeating unit found in mammalian hard bone.
.....
- (b) Write a structural feature that is found only in skeletal muscle cells.
.....
- (iii) Explain the given feeding mechanism.
- (a) Filter feeders -
-
- (b) Substrate feeders -
-
- (iv) (a) Write a function of mucus in human saliva.
.....
- (b) Write the way of absorption of fatty acid and monoglyceride into to blood during the fat digestion.
.....
.....
.....
.....
- (c) What is the meaning or protein sparing?
.....
.....
- (v) (a) What is the type of respiratory pigment present in vertebrate muscles?
.....
- (b) What is the functional residual capacity?
.....
- (c) Write the importance of above capacity.
.....



03. (A) (i) (a) What are the components of lymph nodes.

.....

(b) Write two functions of the human lymphatic system.

.....

.....

(ii) (a) What is stroke volume?

.....

(b) Write 3 functions of human blood.

.....

.....

.....

(iii) (a) What is systolic blood pressure?

.....

.....

(b) What is the blood pressure of a healthy adult?

.....

(iv) (a) What is active immunity?

.....

.....

.....

(b) Name two immunodeficiency diseases.

.....

(v) (a) What are the two types of capillary network found with a nephron?

.....

.....

(b) Write the endocrine function of the human kidney.

.....

(B) (i) Write the difference between nervous coordination and hormonal coordination regarding the transmission and response.

	Nervous coordination	Hormonal coordination
Transmission		
Response		



(ii) (a) Write a way that terminate the signal at presynaptic cells after passing the nerve impulse to the postsynaptic cell.

.....

(b) Name the hormone that mediates long-term stress responses and promotes the breakdown of skeletal muscle protein for the synthesis of glucose.

.....

(iii) (a) How the human brain protects itself from physical damage?

.....

.....

(b) What are the parts of the hindbrain that contribute to the formation of the brainstem.

.....

(iv) (a) What is implantation?

.....

(b) Write three function of the human placenta.

.....

.....

.....

(v) (a) What is the component present in human semen that provides energy to sperm?

.....

(b) Write two function of the Allantois.

.....

.....

(c) What is Abortion?

.....

(C) (i) How oral contraceptives with a high level of progestin prevent conception?

.....

.....

(ii) (a) What are the sinuses?

.....

.....



(b) Name two cranium bones in which sinuses are found.

.....
.....

(iii) Write two functions of secondary curvatures of the human vertebral column.

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

(iv) What is the main feature in the human axis vertebrae separate from other cervical vertebrae.

.....
.....

04. (A) (i) Write two desirable properties carried by the Garden pea plant (*Pisum sativum*). Which make the organisms study the pattern of inheritance?

.....
.....

(ii) (a) Write a Genetic principle that is important in plant and animal breeding.

.....

(b) Write the main difference between inbreeding and hybrid breeding.

.....
.....

(iii) Write the reasons for the following disorders that occur due to Chromosomal mutation.

(a) *Turner syndrome* -.....

(b) *Down syndrome* -.....

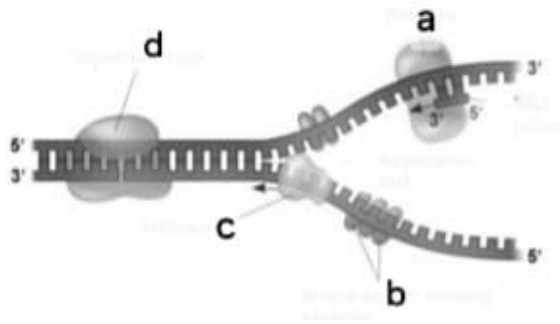
(iv) (a) Write a method of labelling a DNA probe.

.....

(b) Write the main object of using a cloning vector.

.....

(v) Identify the enzyme/ protein given that is important in DNA replication.



- a -
b -
c -
d -

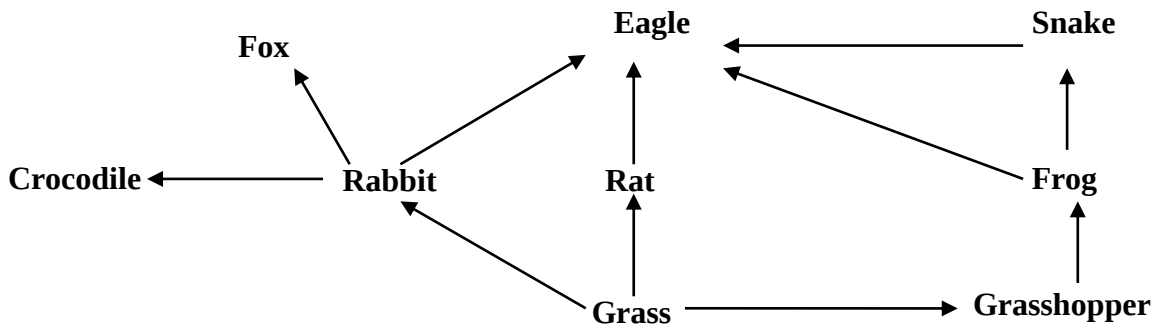
(B) (i) (a) What information is included in the Restriction map?

.....
.....

(b) What is the agreement established in Sri Lanka for minimizing the harmful effects of using new biotechnology?

.....

(ii) Answer using the given food web.



(a) Name two organisms that belong to the end third trophic level.

.....

(b) Which organism's population would decrease if the Eagle were removed from the ecosystem described above.

.....

(iii) (a) Write two characters that can be seen in the savanna biome.

.....

.....



- (b) Write the main structural differences between lagoons and estuaries.
.....
.....
- (iv) (a) Name critically endangered animal that lives in Sri Lanka.
.....
.....
- (b) Name fish species endemic to Sri Lanka.
.....
- (v) What is the object of the Kyoto Protocol?
.....
- (C) (i) (a) Write a generic name of free-living nitrogen-fixing bacteria.
.....
- (b) Write the steps of dry heat sterilization of a pipette in the laboratory.
.....
.....
.....
.....
.....
- (ii) (a) Name a generic name of organisms that are involved in acetic acid fermentation.
.....
- (b) Name a microorganism that is involved in the given process.
 $NO_3^- \rightarrow N_2$
- (iii) (a) During the wastewater treatment, write a method of aeration of water for rapid oxidation.
.....
- (b) Write two external factors that cause food spoilage.
.....
- (iv) (a) What is nanotechnology?
.....
.....
- (b) What is the principle used in food preservation by drying?
.....



Part B – Essay

- Answer only four questions.

05. (a) Explain the chemical nature of a protein that exhibits secondary structure.
(b) Describe the fate of the newly synthesized polypeptide chain.
06. (a) Explain the structure of stomata as observed under a light microscope.
(b) Explain the process of sap ascent in the plant body during the movement of water and minerals.
07. (a) Describe the gross structure of the human lungs.
(b) Explain the role of B lymphocytes in acquired immunity.
08. Explain the characteristics of pathogenic microorganism.
09. (a) Explain the pattern of codominance using an example.
(b) Describe the invasive alien species and explain how they become threatened biodiversity.
10. Write short notes.
(a) Characteristic features of the kingdom fungi
(b) Role of the ear during the equilibrium
(c) Principles in tissue culture
