

Sri Lankan Biology Olympiad 2025 Examination
(October 2025)
Question Paper with Marking Scheme



Instructions:

This paper contains two parts, A and B.

Part A: 30 multiple choice questions with one correct answer; Total Marks 100.

Part B: 20 multiple choice questions with more than one correct answer; Total Marks 100.

Answer All Questions Time 2 hours

Part A - Multiple Choice Questions

Select the correct or the most appropriate answer for the questions in this part and mark that in the answer sheet. For each question there should be only one response

1. The question below is based on the following characteristics of polysaccharides found in living matter.
A – Monomer is glucose
B – Water insoluble
C – Unbranched molecules
Which of the following molecules display all these characteristics?
(1) Amylopectin and Glycogen
(2) Cellulose and Hemicellulose
(3) Cellulose and Amylose
(4) Glycogen and Amylose
(5) Amylose and Pectin

2. Which of the following statements is correct regarding the cytoskeleton of the cell?
(1) It is made up of proteins and carbohydrates.
(2) It is a rigid structure in the cell and never breaks.
(3) It connects with the extracellular matrix.
(4) Its components totally disappear during cell division.
(5) It does not help cytoplasmic streaming.

3. Which of the following statements is correct regarding enzymes?

- (1) Most competitive inhibitors are irreversible.
- (2) The action of competitive inhibitors can be decreased by increasing the substrate concentration.
- (3) All enzymes are regulated by allosteric regulation.
- (4) ADP functions as an allosteric inhibitor.
- (5) An allosteric activator binds at the active site of the subunits of an enzyme.

4. In which phases of the cell cycle are the cell checkpoints available?

- (1) G1, S, G2
- (2) G1, S, M
- (3) G1, G2, Cytokinesis
- (4) G1, G2, M
- (5) G1, S, Cytokinesis

5. The following molecules can be seen in the C4 photosynthetic pathway.

- a. Malate
- b. RuBP
- c. Oxaloacetate
- d. Phosphoenol pyruvate

The correct sequence of the above molecules in the C4 photosynthetic pathway is

- (1) c, a, b and d.
- (2) b, d, c and a.
- (3) d, c, a and b.
- (4) b, c, a and d
- (5) a, c, d and b.

6. Compare Domain Bacteria and Domain Archaea based on the following characteristics:

A: Growth at temperatures above 100°C

B: Presence of peptidoglycan in cell walls

C: Growth inhibition by antibiotics like Streptomycin

Which of the following is correct?

- (1) Bacteria: A-No, B-Yes, C-Yes; Archaea: A-Some species, B-No, C-No
- (2) Bacteria: A-Yes, B-Yes, C-No; Archaea: A-No, B-No, C-Yes
- (3) Bacteria: A-Some species, B-No, C-No; Archaea: A-No, B-Yes, C-Yes
- (4) Both domains have identical responses to all three characteristics
- (5) Bacteria: A-No, B-No, C-No; Archaea: A-Yes, B-Yes, C-Yes

7. A paleontologist is studying the fossil record to understand the timeline of eukaryotic evolution. Based on the fossil evidence, which of the following sequences correctly represents the chronological order of major evolutionary events?

- (1) First eukaryotes → Oldest protists → Cyanobacteria → Animal phyla diversification
- (2) Cyanobacteria → First eukaryotes → Oldest protists → Animal phyla diversification
- (3) Oldest protists → First eukaryotes → Animal phyla diversification → Cyanobacteria
- (4) First eukaryotes → Animal phyla diversification → Oldest protists → Land colonization
- (5) Animal phyla diversification → First eukaryotes → Oldest protists → Land colonization

8. Match the fungal phyla (A, B) with their reproductive characteristics (P, Q, R):

Fungal Phyla:

A - Ascomycota

B - Basidiomycota

Reproductive Characteristics:

P - Produces exogenous spores on specialized structures on gills

Q - Produces conidia exogenously at the tip of conidiophores during asexual reproduction

R - Sexual reproduction involves formation of sac-like structures containing typically eight spores

Select the response with correct combinations:

(1) A matches with P; B matches with Q and R.

(2) A matches with P and R; B matches with Q.

(3) A matches with Q; B matches with P and R.

(4) Both A and B match with all three characteristics..

(5) A matches with Q and R; B matches with P.

9. Consider the following statements about Phylum Cnidaria:

I: Cnidarians have only ectoderm and endoderm layers.

II: All cnidarians have a single opening that functions as both mouth and anus.

III: Cnidarians do not have respiratory or excretory organs.

Which of the above statements is/are correct?

(1) I and II only

(2) I and III only

(3) II and III only

(4) I, II and III

(5) I only

10. The shoot apex in plants,

(1) is a tissue made up of structurally differentiated cells.

(2) is covered by leaf primordia.

(3) produces new cells both inwards and outwards of the stem through mitotic divisions.

(4) helps to increase the diameter of the stem of a plant.

(5) is made up of both living and non-living cells.

11. Which of the following can always be seen in a sieve tube element?

(1) Nuclei (2) Dense cytoplasm (3) Ribosomes

(4) Porous plates (5) Central vacuoles

12. Which of the following characters can be seen in both hornworts and clubmosses however, cannot be seen in spike mosses?

- (1) Homospores (2) Strobili (3.) Stomata
(4) Flagellated male gametes (5) Vascular tissues

13. Which of the following statements is/are correct?

A : Far red light stimulates seed germination

B : In seed germination, when a seedling breaks ground, hypocotyl elongation is inhibited by blue light photoreceptors.

C : Plants in the canopy layer of wet forests absorb more far red light

D : Exposure to direct light will stimulate the vertical growth of plants

- (1) A and B only. (2) A only. (3) B and C only. (4) B only. (5) A , C and D only.

14. Select the response with the correct combination of the element, form of absorption and deficiency symptom in plants

	Element	Form of absorption	Deficiency symptom
(1)	B	H_2BO_3^-	Death of meristematic tissues
(2)	Mn	MnO_4^-	Chlorosis between veins
(3)	Zn	Zn^{2+}	Death of shoot tips
(4)	Mo	MoO_3^{4-}	Chlorosis in older leaves
(5)	Ni	Ni^{2+}	Stunted growth

15. Antibodies

- (1) are secreted by T lymphocytes.
(2) destroy pathogens by phagocytosis.
(3) are membrane bound.
(4) are immunoglobulins.
(5) have a shape similar to T lymphocyte antigen receptors.

16. A common reason for renal calculi is

- (1) High alkaline nature of urine.
(2) smoking.
(3) high intake of sugar.
(4) high F^- level in drinking water.
(5) getting older.

17. Select the correct statement regarding human nephrons.
- (1) Majority of nephrons extend deep into renal medulla.
 - (2) Glomerular capsule consists of two layers of epithelial tissues separated by a thin layer of areolar tissue.
 - (3) Distal convoluted tubule is longer than the proximal convoluted tubule.
 - (4) Lining of the ascending limb of loop of Henle allows free movement of water through it.
 - (5) In the proximal convoluted tubule, resorption of K^+ and secretion of H^+ take place.
18. In the small intestine of humans,
- (1) fatty acids are absorbed as chylomicron globules.
 - (2) vitamins are absorbed by active transportation.
 - (3) water is absorbed by diffusion.
 - (4) amino acids are absorbed by facilitated diffusion.
 - (5) monoglycerides are absorbed into lacteals.
19. In the human heart,
- (1) pericardium consists of outer serous pericardium and inner fibrous pericardium.
 - (2) blood flowing through bicuspid valve has a higher oxygen concentration than the blood flowing through the tricuspid valve.
 - (3) stimulation for contraction originates in the AV node.
 - (4) the thickest area of the wall is in the right ventricle near the Mitral valve.
 - (5) Purkinje fibers transmit electrical impulses from SA node to AV node.
20. If the inspiratory reserve volume, tidal volume and vital capacity of a normal healthy man are 2500 mL, 500 mL and 4800 mL respectively, his inspiratory capacity and expiratory reserve volume are respectively
- (1) 2300 mL and 2000 mL.
 - (2) 3000 mL and 1800 mL.
 - (3) 3000 mL and 2000 mL.
 - (4) 3000 mL and 2500 mL.
 - (5) 4300 mL and 2300 mL.
21. If the secretion of thyroxin and aldosterone of a person is reduced, which of the following is most likely to happen?

	Blood calcium level	Blood volume
(1)	Increased.	Increased.
(2)	Reduced.	Reduced.
(3)	Reduced.	Increased.
(4)	Not changed.	Increased.
(5)	Increased.	Reduced.

22. In the lower limb of humans,

- (1) bones in the foot are arranged in two arches.
- (2) distal end of femur articulates with tibia and fibula to form the knee joint.
- (3) total number of bones is 30.
- (4) five tarsal bones and five metatarsal bones are present.
- (5) medial bone in the shin is fibula.

23. Select the correct 'hormone-site of release-function' combination.

	Hormone	Site of release	Function
(1)	LH	Anterior pituitary	Stimulating the secretion of estrogen
(2)	Oxytocin	Ovary	Facilitating parturition
(3)	Thymosin	Thymus	Maturing of B lymphocytes
(4)	Melatonin	Pineal body	Regulating daily activity levels
(5)	Cortisol	Adrenal cortex	Increasing the rate of glycogen breakdown

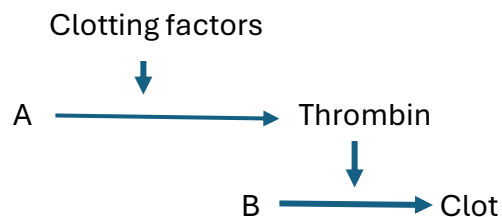
24. Pivot joints allow

- (1) rotation.
- (2) flexion.
- (3) adduction.
- (4) abduction.
- (5) extension.

25. In the human eye,

- (1) circular muscle fibres are present in the ciliary body and iris.
- (2) aqueous humour is secreted by iris.
- (3) cornea does not have a blood supply since it does not need nutrients.
- (4) aqueous humour prevents the eyeball from collapsing.
- (5) Membranous discs with visual pigments are present in the inner segment of the photoreceptor cells.

26. Cascade reactions of blood clotting are given below.



A and B are respectively

- (1) fibrinogen and fibrin.
- (2) prothrombin and fibrin.
- (3) fibrin and fibrinogen.
- (4) prothrombin and fibrinogen.
- (5) fibrin and prothrombin.

27. Which of the following statements is correct regarding Mendel's experiments?

- (1) Mendel used seventeen characters of the pea plant for his experiments.
- (2) He used only the cross-pollinations for the crosses.
- (3) He used a large number of samples and repeated experiments several times.
- (4) He observed only the F1 progeny to get the ratios.
- (5) He was unable to obtain pure breeding lines.

28. Which of the following statements is correct regarding human chromosomes?

- (1) Humans have 23 pairs of autosomes.
- (2) The Y chromosome in humans is smaller than the X chromosome.
- (3) The absence of the X chromosome causes Klinefelter syndrome.
- (4) The factor that determines a boy is received from the father and the mother.
- (5) All the genes present on sex chromosomes are used in the determination of sex

29. A farmer observes two food chains in his paddy field:

Chain X: Rice plant → Grasshopper → Frog → Snake → Eagle

Chain Y: Rice plant → Cattle → Leopard

If both chains start with the same amount of energy from rice plants, which of the following statements is correct regarding energy availability at the top consumers?

- (1) Eagle receives more energy than leopard because it has more feeding opportunities.
- (2) Both eagle and leopard receive equal energy as they start from the same producer.
- (3) Leopard receives more energy than eagle because shorter food chains are more efficient.
- (4) Eagle receives more energy than leopard because longer chains allow better energy distribution.
- (5) Energy availability is independent of food chain length.

30. The following gases contribute to atmospheric pollution in different ways:

Gases:

A - Carbon dioxide

B - Sulphur dioxide

C - CFC (Chlorofluorocarbon)

Environmental effects:

P - Causes depletion of the ozone layer.

Q - Main contributor to greenhouse effect and global warming

R - Forms sulphuric acid leading to acid rain.

Select the correct combination:

- (1) A-Q, B-R, C-P
- (2) A-P, B-Q, C-R
- (3) A-R, B-P, C-Q
- (4) A-Q, B-P, C-R
- (5) A-P, B-R, C-Q

Part B – Multiple Choice Questions with more than one correct answer

In the questions of this part, one or more responses is/are correct. Mark the correct response/ responses in the answer sheet. When any response is wrong, no marks shall be awarded to that question.

1. Which of the following sentences on amino acids and polypeptide chains is/are correct?
 - (1) Amino acids always contain one amino group and one carboxyl group
 - (2) The amino group of an amino acid is acidic, whereas the carboxyl group is alkaline.
 - (3) A water molecule is absorbed during the formation of peptide bond between two amino acids.
 - (4) One end of the polypeptide chain has an amino group, whereas the other end has a carboxyl group.
 - (5) Back backbone of the polypeptide chain contains the amino groups and carboxyl groups of amino acids.
2. Which of the following sentences regarding respiration is/are correct?
 - (1) Electron acceptors are embedded in the inner membrane of the mitochondria.
 - (2) The intermembrane space of mitochondria is essential for the synthesis of ATP.
 - (3) CO₂ and O₂ diffuse through the membranes of mitochondria.
 - (4) CO₂ is a byproduct synthesized in mitochondria.
 - (5) The only product that can be taken by a cell from mitochondria is ATP.
3. Which of the following sentences regarding photosynthesis is/are correct?
 - (1) PSI effectively absorbs 680nm wavelengths.
 - (2) The light-harvesting center of photosystems contains the primary electron acceptor.
 - (3) ATP is produced in bundle sheath cells.
 - (4) Glucose is produced in both mesophyll and bundle sheath cells.
 - (5) NADPH reductase enzyme is needed for cyclic electron flow.
4. **Select the correct statement/statements regarding the diversity of plants.**
 1. Spike mosses are homosporous with horizontal growth, while club mosses are heterosporous with upright stems and strobili.
 2. Bryophyte sporophytes possess stomata and are photosynthetic but remain dependent on the gametophyte for nutrition.
 3. Cycads have flagellated sperms and palm-like leaves, while Gnetum possesses vessels in xylem and angiosperm-like seed structures.
 4. All members of phylum Pterophyta are heterosporous, producing megaspores that develop into female gametophytes and microspores that develop into male gametophytes.
 5. In seed plants, the megasporangium is retained within the parent sporophyte and surrounded by integuments, forming the ovule structure.

Correct Answers: 2, 3, and 5 only

5. Select the correct statement/statements regarding the hierarchy of taxa and species concepts:
- (1) From domain to species, the number of shared characteristics among members in the taxa increases.
 - (2) The biological species concept defines species as organisms that share similar morphological features.
 - (3) From species to domain, the number of individuals in the taxon increases.
 - (4) The phylogenetic species concept defines species as the smallest group sharing a common ancestor.
 - (5) Kingdom is divided directly into classes in the hierarchical system.
- Correct Answers: 1, 3, 4

6. A zoologist is comparing different classes within Phylum Chordata. Which of the following comparative statements is/are correct?
- (1) Amphibians undergo metamorphosis and require water for reproduction, while reptiles have direct development and amniotic eggs.
 - (2) Mammals are endothermic, while birds are ectothermic.
 - (3) All chordates possess a notochord and pharyngeal slits at some stage of development.
 - (4) Fish have a two-chambered heart, reptiles have a three-chambered heart, while birds have a four-chambered heart.
 - (5) Reptiles and birds possess scales in the body covering.
- Correct Answers: 1, 3, 4, 5

7. The cork cambium of dicotyledonous plants,
1. produces a tough thick covering composed of thick cell walls.
 2. increases the girth /circumference of mature stems and roots.
 3. produces medullary rays
 4. prevents the water loss from the stem
 5. produces the parts which are responsible for the gaseous exchange through stem

Answers : 1, 2, 4 and 5

8. Select the correct statement/statements regarding the stomatal transpiration in higher plants,
- (1) It occurs according to a water potential gradient.
 - (2) The process of transpiration is regulated by the diffusion shells.
 - (3) The rate of transpiration increases when the wind speed is slower.
 - (4) When the relative humidity of the external environment increases, the rate of transpiration decreases
 - (5) Concentration of water vapour in the substomatal spaces makes an impact on stomatal transpiration

Answers : 1,2,4 and 5

9. Select the structure/structures which can be found in certain groups of gymnosperms and never found in angiosperms

- (1) Pollen grains
- (2) Branched pollen tube
- (3) Motile male gametes
- (4) Archegonia
- (5) Ovules

Answers : 2, 3 and 4

10. Select the correct statement/statements regarding human stomach.

- (1) It absorbs water.
- (2) It is involved in immunity.
- (3) It secretes pepsin.
- (4) It secretes gastrin.
- (5) Its lining is replaced in every two days.

11. Select the correct 'part of the brain-function' combination/combinations..

	Part of the brain	Function
(1)	Pons Varolii	Coordinating visual reflexes
(2)	Thalamus	Acting as a relay station
(3)	Mid brain	Acting as a relay station
(4)	Cerebellum	Coordinating large scale body movements
(5)	Hypothalamus	Controlling involuntary reflexes

12. Select the correct statement/statements regarding neurons.

- (1) A nerve impulse is generated due to outflow of K^+ .
- (2) Many potassium channels close during the repolarization phase.
- (3) Inside of a neuron is negatively charged at rest.
- (4) Sodium channels open during hyperpolarization phase.
- (5) During the resting stage, the sodium-potassium pump transports two Na^+ ions out of the neuron for every three K^+ ions transported in.

13. Select the correct statement/statements regarding the human male reproductive system.

- (1) FSH stimulates Leydig cells to secrete inhibin.
- (2) Sperm mature in vas deferens.
- (3) Sperm become motile in the ejaculatory duct.
- (4) Modified veins contribute to form the erectile tissue in the penis.
- (5) In a healthy mature man, sperm take about a month to travel through epididymis.

14. Select the correct statement/statements regarding the regulation of body temperature.

- (1) Secretion of thyroxin is inhibited due to increase in body temperature.
- (2) Arterioles in the dermis constrict due to decrease in body temperature.
- (3) Temperature control centre is located in the cerebellum.
- (4) When body temperature increases, oxidation of fat in the liver increases.
- (5) In a cold environment, adrenalin secretion is increased.

15. Select the correct 'tissue-location' combination /combinations.

Tissue	Location
(1) Simple squamous epithelium	Lung
(2) Stratified squamous epithelium	Anus
(3) Simple cuboidal epithelium	Small intestine
(4) Simple columnar epithelium	Thyroid gland
(5) Pseudo stratified epithelium	Skin

16. Select the correct statement/statements regarding the human red blood cells .

- (1) Generally, one milliliter of blood contains 4-6 million red blood cells.
- (2) Aerobic respiration does not occur within them.
- (3) They are biconvex discs.
- (4) Their life span is around 120 days.
- (5) They are responsible for ABO blood groups.

17. Select the correct statement/statements regarding semen of man.

- (1) It is a mixture of sperm and secretions of two accessory glands.
- (2) The number of sperm in the semen of a normal ejaculate of a healthy man can be as high as 500 million.
- (3) Sperm usually comprise about 20% of semen.
- (4) It contains Vitamin C and sucrose.
- (5) Alkaline mucus secreted mainly by the prostate gland helps to neutralize acidity in the female reproductive tract.

18. Select the correct statement/statements.

- (1) The recessive trait is masked when in a heterozygous state of a gene.
- (2) The genetic composition of a gene is called the genotype.
- (3) Haemophilia and Thalassaemia are caused by X-linked recessive genes.
- (4) The only occurrence of gene mutations takes place due to spontaneous effect.
- (5) Down syndrome is caused by the presence of an extra chromosome in the 21st pair of autosomes.

19. Which of the following is/are adverse effects of acid rain?

- (1) Destruction of forests and crops
- (2) Increase in biodiversity of aquatic ecosystems
- (3) Destruction of aquatic organisms due to increased acidity in water
- (4) Dissolution of limestone rocks and marble buildings
- (5) Enhancement of mineral absorption by plants

Correct Answers: 1, 3, 4

20. An environmental health officer is educating a community about different types of pollutants and their harmful effects. Which of the following statement/statements presented by her accurately describe the characteristics or effects of environmental pollutants?

- 1. Heavy metals like mercury (Hg) and cadmium (Cd) persist in the environment without easy degradation
- 2. Persistent Organic Pollutants (POPs) such as DDT bioaccumulate along food chains
- 3. Electronic waste (e-waste) is being added to the environment at a higher rate due to modern technology
- 4. Eutrophication causes algae to grow excessively, leading to oxygen depletion and death of aquatic organisms
- 5. Liquid droplets like water and mercury do not contribute to air pollution as particulate matter

Correct statements = 1,2,3, 4