ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்
Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2026
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2026
General Certificate of Education (Adv. Level) Examination, 2026

ජීව විද්‍යාව I உயிரியல் I Biology I	09 E I	පැය දෙකයි இரண்டு மணித்தியாலம் Two hours

Instructions:

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

1. Which of the following is a communicable disease?
   (1) Cancers (2) Chronic renal diseases (3) Diabetes
   (4) AIDS (5) Heart diseases

2. Which of the following statements regarding the structure of proteins is correct?
   (1) Linearly arranged unique sequence of 24 amino acids forms the primary structure of proteins.
   (2) Every amino acid in proteins is composed of H, N, O, S and a symmetric C atom in the centre.
   (3) Keratin is a β pleated sheet formed as a result of intra-molecular hydrogen bonds.
   (4) Albumin has a compact and unique secondary structure due to folding of the primary structure.
   (5) Haemoglobin has a quaternary structure formed by aggregation of more than one polypeptide chains.

3. Which of the following 'subcellular component - function' combinations are correct?

Subcellular component	Function
A – Lysosome	Digestion of worn out organelles
B – Peroxisome	Production of transport vesicles
C – Smooth ER	Storage of calcium ions
D – Rough ER	Synthesis of steroids

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

4. Stages of meiosis during which the chromosome decondensation occurs are
   (1) prophase I and telophase I. (2) prophase I and anaphase I.
   (3) telophase I and telophase II. (4) prophase II and telophase II.
   (5) anaphase II and telophase II.

5. Which of the following statements regarding inhibition of enzyme activity is correct?
   (1) Competitive inhibitors resemble the shape of the active site of the enzyme.
   (2) Non-competitive inhibitors reduce the number of active sites available in the enzyme molecule.
   (3) Feedback inhibition prevents the wastage of chemical resources by binding of the end product to the substrate.
   (4) An allosteric inhibitor binds to the regulatory site of the enzyme and affects the active sites of all its sub units.
   (5) ADP acts as an allosteric inhibitor to slow down the rate of production of ATP.

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6. During the C_4 pathway of photosynthesis,
   (1) light reaction is carried out in chloroplasts of both mesophyll and bundle sheath cells that contain PS I and PS II.
   (2) Oxaloacetate which is the first product of CO_2 fixation is diffused to bundle sheath cells and converted to malate.
   (3) malate diffuses to mesophyll cells and becomes pyruvate after releasing CO_2.
   (4) CO_2 released by malate is refixed by Rubisco in bundle sheath cells.
   (5) ATP is generated through cyclic and linear electron flows in bundle sheath cells.

7. Which of the following statements regarding the link reaction of cellular respiration is/are correct?
   A – Two pyruvate molecules enter the mitochondrion passively through its membrane.
   B – Pyruvate is converted to acetyl group and two CO_2 molecules are released.
   C – 2.5 ATP molecules are produced by oxidative phosphorylation.
   (1) A only. (2) B only. (3) C only.
   (4) A and B only. (5) B and C only.

8. Which of the following was used by Lamarck to explain his hypothesis on evolution?
   (1) Inherited traits of organisms in a population vary.
   (2) Every species produce more offspring than the number that the environment can accommodate.
   (3) Body parts of organisms that are not used deteriorate.
   (4) Organisms compete with each other for survival.
   (5) Some organisms of a population produce lesser number of offspring than others.

9. Select the artificial group/groups of the following.
   A – Protista B – Viruses C – Bacteria
   (1) A only. (2) B only. (3) A and B only.
   (4) B and C only. (5) A, B and C.

10. Which of the following can be used to distinguish *Ulva*, *Gelidium* and *Sargassum* from each other?
   (1) Presence of cellulose in the cell wall
   (2) Type of stored food
   (3) Multicellular thallus
   (4) Nature of the holdfast
   (5) Habitat

11. Ectothermic animals with a bony skeleton can be found in which of the following classes of phylum Chordata?
   A – Osteichthyes B – Amphibia C – Reptilia D – Aves
   (1) A and B only. (2) B and C only. (3) C and D only.
   (4) A, B and C only. (5) B, C and D only.

12. Some structures found in the vascular tissues of plants and their features are given below.

Structure	Feature
A – Vessel element	P – Cytoplasm present as a thin peripheral layer
B – Tracheid	Q – Helps in phloem loading
C – Sieve tube element	R – Cell walls are interrupted by pits
D – Companion cell	S – Perforation plates are present

Select the option with all correct 'structure - feature' combinations.
(1) A – S, B – P, C – R, D – Q
(2) A – R, B – S, C – P, D – Q
(3) A – S, B – R, C – Q, D – P
(4) A – S, B – R, C – P, D – Q
(5) A – S, B – Q, C – P, D – R

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13. Which of the following statements regarding the closing of stomata is/are correct?
A – Guard cells expand.
B – Guard cells lose water.
C – Turgor pressure inside guard cells increases.
(1) A only. (2) B only. (3) A and B only.
(4) A and C only. (5) B and C only.

14. Dioecious gametophyte and dioecious sporophyte can be seen respectively in
(1) *Pogonatum* and *Nephrolepis*.
(2) *Pogonatum* and *Selaginella*.
(3) *Pogonatum* and *Cycas*.
(4) *Nephrolepis* and *Cycas*.
(5) *Nephrolepis* and *Selaginella*.

15. Which of the following plants is/are capable of producing seedless fruits?
A – Banana B – Grapes C – Oranges
(1) A only. (2) A and B only. (3) A and C only.
(4) B and C only. (5) A, B and C.

16. A plant hormone involved in lateral expansion of seedlings is
(1) auxin. (2) gibberellins. (3) cytokinins.
(4) abscisic acid. (5) ethylene.

17. Organisms that are involved in the ecological relationships of parasitism, commensalism and mutualism are respectively
(1) *Loranthus*, epiphytic orchids and *Cycas*.
(2) *Plasmodium*, termite and *Anabaena*.
(3) *Cuscuta*, *Drosera* and *Rhizobium*.
(4) *Utricularia*, barnacle and *Anabaena*.
(5) *Nepenthes*, whale and termite.

18. Which of the following 'tissue - location - function' combinations is correct?

Tissue	Location	Function
A – Stratified squamous epithelium	P – Intestine	X – Secretion
B – Simple columnar epithelium	Q – Salivary glands	Y – Active absorption
C – Simple cuboidal epithelium	R – Blood capillaries	Z – Material exchange

(1) A – R – X (2) A – P – Y (3) B – P – Z (4) C – Q – X (5) C – R – X

19. Which of the following statements regarding the human digestive system is correct?
(1) Vitamins synthesized in the colon help in preventing bone softening.
(2) Absorption of water takes place in the stomach, small intestine and large intestine.
(3) Multinucleated muscle cells are absent in the digestive tract.
(4) Small intestine secretes secretin which regulates digestion in stomach.
(5) Digestion of fats starts in the stomach.

20. Types of circulatory systems and examples for animals having those are given below. Which of these 'circulatory system - example' combinations is/are correct?

Type of circulatory system	Example
A – Open circulatory system	Molluscs
B – Closed single circulatory system	Amphibians
C – Closed double circulatory system	Mammals

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

21. Which of the following statements regarding the human blood circulatory system is correct?
(1) Right atrio-ventricular valve consists of two flaps.
(2) First arteries that arise from aorta supply blood to the brain.
(3) Oxygen poor blood from fore limbs reach heart via inferior vena cava.
(4) Mitral valve is devoid of tissues other than myocardium.
(5) Blood entering pulmonary artery has a lower pressure than that of the blood entering aorta.

22. Which of the following statements regarding respiration of humans is correct?
(1) Partial pressure of O_2 in exhaled air is higher than that of CO_2.
(2) Contraction of smooth muscles in the diaphram results in inhalation.
(3) Exhalation occurs due to reducing of the thoracic cavity volume as a result of contracting intercostal muscles.
(4) In addition to medulla oblongata, thalamus also regulates breathing.
(5) Vital capacity is the total of tidal volume and inspiratory reserve volume.

23. Select the correct statement regarding immunity of man.
(1) Immunoglobulins are injected to get life-long immunity.
(2) B lymphocytes are activated by helper T cells to produce antibodies.
(3) Antibodies are secreted by plasma cells which are produced by T lymphocytes.
(4) Epitopes of T and B lymphocytes can bind with antigens.
(5) Antibodies bind to pathogens and kill them.

24. In which of the following pairs does an increase in (i) cause an increase in (ii)?

A	(i)	Aldosterone level in blood
	(ii)	K^+ concentration in urine
B	(i)	Angiotensin level in blood
	(ii)	Blood pressure
C	(i)	ADH level in blood
	(ii)	Blood volume

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

25. Which of the following neurotransmitters is associated with schizophrenia?
(1) Acetyl choline
(2) Neuropeptides
(3) Biogenic amines
(4) Dopamine
(5) Norepinephrine

26. Eustachian tube of humans is located between
(1) inner ear and larynx.
(2) middle ear and larynx.
(3) middle ear and pharynx.
(4) inner ear and pharynx.
(5) middle ear and inner ear.

27. A person complains of weight gain, lethargy, cold skin and constipation. Which of the following can be the most likely reason for these conditions?
(1) High production of triiodothyronine
(2) An autoimmune disease attacking parathyroid glands
(3) A tumour in cerebrum
(4) Lack of TSH production
(5) Malfunctioning of liver

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28. Which of the following is the correct sequence of intra-cytoplasmic sperm injection method?
(1) Removing an oocyte from the ovary, fertilization by immersing in semen, incubation until 8-cell stage, insertion of embryo into uterus, implantation
(2) Stimulation of ovary, injecting sperm into uterus, fertilization, implantation
(3) Removing an oocyte from the ovary of a woman and inserting it into the uterus of another woman, injecting sperm into uterus, fertilization, implantation
(4) Injecting sperm into uterus, fertilization, removing fertilized egg and transferring it into the uterus of another woman, implantation
(5) Removing an oocyte from the ovary, injecting a sperm into that oocyte, fertilization, transferring the fertilized egg into the uterus, implantation

29. If the blood testosterone level of a man increases suddenly, which of the following responses is/are most likely to occur?
A – Increase in FSH secretion from anterior pituitary
B – Stimulation of Sertoli cells to secrete inhibin
C – Inhibition of GnRH release from hypothalamus
D – Stimulation of anterior pituitary to secrete LH
(1) A only. (2) B only. (3) C only.
(4) A and B only. (5) B and C only.

30. Which of the following statements regarding human vertebrae is correct?
(1) Axis vertebra contributes to turn the head from side to side.
(2) Atlas vertebra is ring shaped and does not have transverse processes.
(3) Some thoracic vertebrae possess transverse foramina.
(4) Some lumbar vertebrae have a bifid spinous process.
(5) Sacrum is formed by fusion of the four terminal vertebrae.

31. Which of the following movements is generally shown by most hinge joints?
(1) Adduction (2) Abduction (3) Rotation
(4) Circumduction (5) Flexion

32. In pea plants yellow flower colour (Y) and round seeds (R) are dominant to white flower colour (y) and wrinkled seeds (r) respectively. When a plant showing dominant traits was subjected to a dihybrid test cross, 50% of the offspring had yellow flowers and round seeds while the other 50% had white flowers and round seeds. Genotypes of the parents of these offspring are
(1) YYRR and yyrr. (2) YyRR and yyrr. (3) YYRr and Yyrr.
(4) yyRR and YYrr. (5) YyRr and yyrr.

33. A trait determined by polyallelism in humans is
(1) ABO blood groups. (2) skin colour.
(3) red green colour blindness. (4) Schizophrenia.
(5) height.

34. Steps involved in the initiation stage of translation process of polypeptide synthesis are given below.
A – Formation of hydrogen bonds between anticodon of the initiator tRNA and AUG start codon
B – Binding of small subunit of ribosome to mRNA and initiator tRNA which carries methionine
C – Moving of mRNA until AUG start codon aligns with P site of large subunit
D – Combining of two subunits of ribosome to form functional ribosome
The correct sequence of above steps is
(1) B, A, C and D. (2) B, A, D and C. (3) B, D, C and A.
(4) C, B, A and D. (5) C, B, D and A.

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35. Which of the following has been signed with the aim of protecting biological diversity from the potential risk of genetically modified organisms?
(1) Cartagena Protocol (2) Montreal Protocol
(3) Kyoto Protocol (4) Basel Convention
(5) Convention on Biological Diversity

36. Which of the following biomes shows the minimum range of average annual rainfall/precipitation?
(1) Savanna (2) Tundra
(3) Temperate grasslands (4) Temperate broadleaf forests
(5) Northern coniferous forests

37. Which of the following pairs of features of mycoplasma and unicellular protists are correct?

	Mycoplasma	Unicellular protists
A –	Shape varies from spherical to filamentous.	Exist individually or form colonies.
B –	Possess flagella.	Possess flagella and cilia.
C –	Reproduce by budding and binary fission.	Reproduce by fission and forming gametes.
D –	Obligate anaerobic.	Aerobic, anaerobic and facultative anaerobic.

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

38. In which of the following human organ systems do *Streptococcus* species cause diseases?
A – Cardiovascular system B – Nervous system
C – Digestive system D – Urinary system
E – Respiratory system
(1) A, B and C only. (2) A, B and D only. (3) A, B and E only.
(4) B, C and D only. (5) B, C and E only.

39. Which of the following combinations of microorganisms and their uses is correct?
(1) *Spirulina* and *Nostoc* – High protein food supplement
(2) *Rhizopus* spp. – Protease production
(3) Acetogenic bacteria – Production of hydrogen and methane through anaerobic digestion of organic waste
(4) *Acetobacter* spp. – Production of Vitamin B_{12}
(5) *Aspergillus niger* – Commercial production of citric acid

40. Some vegetative propagation structures and the plants that use them are given below.

Vegetative propagation structure	Plant
A – Corms	P – Mint
B – Runners	Q – *Alocassia*
C – Stolons	R – Spider plant

Select the option with all correct 'vegetative propagation structure - plant' combinations.
(1) A – P, B – Q, C – R
(2) A – P, B – R, C – Q
(3) A – R, B – P, C – Q
(4) A – Q, B – P, C – R
(5) A – Q, B – R, C – P

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- **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 (A), (B) and (D) are correct ..... (1)
If only (A), (C) and (D) are correct ..... (2)
If only (A) and (B) are correct ..... (3)
If only (C) and (D) are correct ..... (4)
If any other response or combination of responses is correct ..... (5)

Directions summarised				
(1)	(2)	(3)	(4)	(5)
(A), (B), (D) correct.	(A), (C), (D) correct.	(A), (B) correct.	(C), (D) correct.	Any other response or combination of responses correct.

41. If the Golgi apparatus of a cell is not functioning properly which of the following would be affected?
(A) Production of lysosomes
(B) Manufacturing cellulose
(C) Detoxification
(D) Distribution of membrane lipids
(E) Metabolism of carbohydrates

42. The dominant plant types, types of spores produced by them and some examples showing those features are given below.

Dominant plant type	Type of Spores	Example
P – Sporophyte	R – Homospores	X – *Nephrolepis*
Q – Gametophyte	S – Heterospores	Y – *Pogonatum*
		Z – *Cycas*

Which of the above 'dominant plant type - type of spore - example' combinations is/are correct?
(A) P – R – X (B) P – R – Y (C) P – S – Z (D) Q – R – Y (E) Q – R – X

43. Which of the following contributes/contribute to capture the maximum amount of light by plants?
(A) Length of the stem
(B) Branching pattern
(C) Vertical orientation of leaves
(D) Phyllotaxy
(E) Strong stem due to primary growth

44. Which of the following are the functions of the human hypothalamus?
(A) Regulating sleep and wake cycles
(B) Controlling vomiting
(C) Initiating fight or flight response
(D) Regulating water balance
(E) Maintaining posture

45. Which of the following statements regarding human fetal membranes is/are correct?
(A) Amnion helps to prevent desiccation of the fetus.
(B) Yolk sac contributes to the development of gonads.
(C) Allantois produces hCG that contributes to maintain corpus luteum.
(D) Chorion protects fetus from the immune responses of mother.
(E) Amnion is associated with the development of urinary bladder.

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46. Which of the following combinations regarding mutations and human genetic disorders is/are correct?
(A) Aneuploidy – trisomy – Down syndrome
(B) Polyploidy – trisomy – Klinefelter syndrome
(C) Aneuploidy – monosomy – Turner syndrome
(D) Aneuploidy – trisomy – Klinefelter syndrome
(E) Aneuploidy – monosomy – Down syndrome

47. Which of the following combinations that indicate some ecosystems in Sri Lanka and the climate zones they are present is/are correct?
(A) Dry patana – dry zone
(B) Tropical montane forests – dry zone
(C) Savanna – dry zone
(D) Talawa – wet zone
(E) Dry monsoon forests – arid zone

48. An exotic organism and an endemic organism of Sri Lanka are respectively
(A) tilapia and black ruby barb.
(B) rubber and Goraka/Gorakappuli.
(C) tilapia and snakehead.
(D) Indian pitta and Hora/Ennai.
(E) blue magpie and elephant.

49. Which of the following statements regarding purification of industrial wastewater is/are correct?
(A) Solid matter is settled out in sedimentation tanks during primary treatment.
(B) Sludge collected from primary treatment is converted to CO_2 and methane.
(C) Microbial oxidation of organic matter is facilitated in trickling filters during primary treatment.
(D) Fine sand beds are used to remove protozoan cysts during secondary treatment.
(E) Anaerobic digestion takes place in the activated sludge during secondary treatment.

50. Which of the following are general characteristics that should be present in fish species that could be cultured?
(A) Ability to feed on formulated food
(B) Ability to tolerate high population density
(C) Reproducing easily in grow-out ponds
(D) Consumer acceptability
(E) Sexually maturing at very young age

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ජීව විද්‍යාව	II
உயிரியல்	II
Biology	**II**

09 E II

Part B - Essay

Instructions:

* *Answer **four** questions only.*
  Give clear labelled diagrams where necessary.
  (Each question carries **150** *marks.)*

5. (a) Describe the steps of the two common types of fermentation.

   (b) Briefly describe the major characteristic features of bacteria.

6 (a) Briefly describe the process of water loss in plants by stomatal transpiration.

   (b) Explain how root pressure is developed and how it affects guttation in plants.

7. (a) Briefly describe the basic plan and functions of the human lymphatic system.

   (b) Explain the risk factors for hypertension and its consequences.

8. (a) Describe the histological structure of a liver lobule of humans.

   (b) Explain the role of liver in maintaining homeostasis in humans.

9. (a) Discuss the environmental service value and educational value of biodiversity

   (b) Briefly describe the toxigenecity of pathogenic microorganisms.

10. Write short notes on the following.

   (a) Dominant epistasis

   (b) Environmental issues associated with genetically modified organisms

   (c) Postharvest losses during storage

* * *