

Department of Education - Western Province

General Certificate of Education (Adv. Level) Final Term Evaluation 2026

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Time } Three hours and ten minutes

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Index No.

Paper	Marks	Percentage
Paper I		
Paper II		
Total		

Part A - Structured Essay

- **Answer all the questions.** (Each question carries **100** marks)

(01) A) i) a) Which form of aldose sugar contributes to the formation of a non-reducing disaccharide?

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b) What is the monomer of the polysaccharide that makes up the cell wall of fungi?

.....

ii) a) What specimen can be used to observe the stages of mitotic division under a light microscope in the school laboratory?

.....

b) What is used to prevent air bubbles from entering the specimen mentioned in (ii) a above, when preparing it for observation?

.....

iii) What is considered as the denaturation of proteins?

.....

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.....

iv) Mention **three** functions of proteins present in the plasma membrane.

.....

.....

.....

v) a) Mention **two** types of lipids synthesized by the smooth endoplasmic reticulum.

.....

b) Which subcellular component produces the organelle that is involved in digesting food particles received by phagocytosis within a cell?

.....

B) i) a) Mention the structure of the intermediate filaments of the cytoskeleton

.....

.....

b) Write **two** other functions performed by cilia in addition to acting as locomotor appendages

.....

.....

ii) a) What is the most common glycoprotein in the extracellular matrix of most animal cells?

.....

b) How is the protein mentioned in (ii) (a) above bound to the plasma membrane?

.....

iii) a) The pairs of chromatids of the chromosomes in a cell at metaphase of meiosis II may not be genetically identical. This is due to which process occurred during which stage of cell division?

Stage -

Process -

b) How is the process mentioned in (iii) (a) important for the survival of a species?

.....

iv) What is the significance of ATP molecule being a mobile molecule?

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v) a) What is the importance of the induced fit mechanism?

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b) Write **two** anatomical differences between the chloroplasts of the mesophyll cells and the bundle sheath cells of C₄ plants.

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c) State the product produced in photosystem I during the linear electron flow of the light reaction and indicate which reaction in the Calvin cycle it is used for.

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C) i) a) Write **two** factors that should be kept constant when investigating how the rate of photosynthesis changes with light intensity using the Audus apparatus.

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b) What is the main limiting factor for the process of photosynthesis under normal conditions?

.....

ii) In the citric acid cycle, state the products formed when one glucose molecule undergoes aerobic respiration and their amounts

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iii) State how long ago the following incidences occurred

a) Finding fossils similar to red algae

b) Colonization of land by fungi

iv) a) Mention **two** other characteristics used, in addition to molecular biological characteristics for natural classification.

.....

.....

b) Write the taxonomic hierarchy in order of increasing common characteristics.

.....

.....

v) What was the first major split in the history of life during the evolutionary process?

.....

(02) A) This question is based on the following groups of organisms.

Yeast , *Hydra* , Jelly fish , *Fasciola* , Pin worm , Earthworm , Sea star , Cockroach, Snail , Frog

i) Select and state the organism from the list given above that exhibits the following characteristic/s

a) Endoskeleton consisting of plates

b) Bisexual triploblastic organism

c) Body is covered with thin, moist glandular skin

d) Branched gastrointestinal cavity

e) Body is covered by a tough cuticle and does not show distinct cephalization.

f) A well-developed nervous system with a primitive dorsal brain.

ii) State **four** main characteristics found in terrestrial plants that are not found in green algae.

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.....

iii) State **two** terrestrial plant genera with dominant gametophytes.

.....

.....

iv) Mention **two** places where the collenchyma cells of plants are found as strands.

.....

.....

v) Write **two** structural features that differentiate the vascular bundles of monocotyledonous plant stems from the vascular bundles of dicotyledonous plant stems.

.....

.....

B) i) Briefly explain how dissolving solutes in pure water can cause a negative effect on water potential.

.....

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.....

ii) a) What are the methods by which water and minerals are transported from the symplast to the apoplast?

.....

b) State **two** factors on which the thickness of the diffusion shell around the stomata depends.

.....

.....

iii) State how root pressure is generated.

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iv) What is known as seed dormancy?

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v) a) Mention the importance of double fertilization of angiosperms.

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b) Write a difference between the endosperm of angiosperms and the endosperm of gymnosperms.

.....

.....

c) What is the hormone that is important to promote the movement of nutrients into the sink tissues of plants?

.....

C) i) State the location of sinusoids and bile ducts in the lobule of the liver

Sinusoids -

Bile ducts -

ii) a) State why a closed circulatory system is more important than an open circulatory system for active and large animals.

.....

.....

b) How does it ensure that blood flows in only one direction in the heart and in the large vessels?

.....

.....

iii) What are known as complement proteins?

.....

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iv) a) Mention what are known as allergens.

.....

b) What are the effects of acute allergic conditions?

.....

.....

- v) Mention a type of major signalling molecule that contributes to initiating the inflammatory response.

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(03) A) Answer the following questions regarding the renin-angiotensin system in relation to the homeostasis of the human body.

- i) a) When what condition in the human body changes, the kidneys begin to secrete renin?

.....

- b) What function is performed by the secretion of Renin?

.....

.....

- c) Write the function of the hormone secreted by the adrenal cortex in relation to the above renin-angiotensin system.

.....

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- ii) a) State how the nervous system of *Planaria* is organized.

.....

- b) Mention **two** places where cerebrospinal fluid is present.

.....

.....

- c) What factors are involved to maintain the resting membrane potential of neurons?

.....

.....

.....

- iii) a) Name the parts that make up a 'tastebud'

.....

.....

.....

- b) Name the locations of the chemoreceptors that are capable of detecting the concentration of CO₂ in the circulating blood.

.....

.....

- iv) Name **three** layers that make up the wall of the eye in order from outside to inside.

.....

.....

.....

v) What is the main cause of 'glaucoma'?

.....

B) i) Name the hormone that stimulates the synthesis of glucose from non-carbohydrate sources.

.....

ii) Name the **three** main chambers of the cochlea of the inner ear in order from top to bottom.

.....

.....

.....

iii) Among the chambers mentioned in (B) ii above, name the chamber/chambers that contain the endolymph.

.....

iv) Name the specific site where hormones secreted by the posterior pituitary are produced.

.....

v) Mention **two** target sites of the hormone oxytocin.

.....

C) i) a) Name the main hormone that is important for maintaining pregnancy.

.....

b) State the types of blood vessels contained in the placenta and their amounts.

.....

.....

ii) a) Name the paired bones that contribute to the formation of the skull.

.....

b) What individual bones contribute to the formation of the face?

.....

iii) a) What types of bones are involved in building up the thoracic cavity?

.....

.....

.....

b) Write **two** characteristics that differentiate the Atlas vertebrae from a typical vertebrae.

.....

.....

iv) What is the function of Ca^{2+} in muscle contraction in relation to the sliding-filament theory?

.....

v) In pea plants, tall (T) is dominant to short (t) and red colored flowers (R) are dominant to white colored flowers (r). A heterozygous tall, red flower-bearing pea plant was test-crossed.

a) What are the genotypes of parental plants?

.....

b) What are the phenotypic ratios of (F₁) obtained from this cross?

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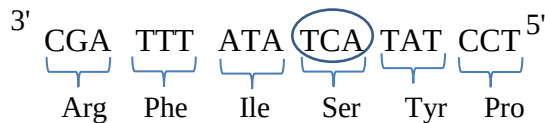
(04) A) i) a) Why does only one strand of double-stranded DNA act as a template for transcription in the mechanism of polypeptide synthesis?

.....

b) What stimulates the formation of peptide bonds in the translation of polypeptide synthesis?

.....

ii) The diagram below shows a portion of the DNA coding chain showing the nucleotide sequence for a polypeptide and its corresponding amino acids.



a) Write the mRNA nucleotide sequence that corresponds to the DNA coding sequence given above.

.....

b) Name the type of specific point mutation that would occur if A were to substitute C in the 3' - TCA-5' triplet circled in the DNA coding sequence shown above.

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iii) a) State the two methods by which DNA copies can be multiplied in gene technology, when a large number of copies of DNA are required.

.....

b) What are the advantages of using 'YACs' as vectors?

.....

iv) Briefly explain what type of primer is used in the PCR mixture.

.....

v) What is called 'genetic pollution' in environmental issues related to the use of GMOs?

.....

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B) i) a) Write the levels of organization of the environment in order.

.....

.....

b) Briefly explain why the number of trophic levels in a food chain is limited to four or five.

.....

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.....

ii) a) State the **two** factors that determine the type of 'Biome' that can exist in a particular area.

.....

.....

b) Why is the diversity of shrubs and plants in northern coniferous forests is lower than in temperate broadleaf forests?

.....

.....

iii) Name the type of ecosystem in Sri Lanka where the following grass species are commonly found.

a) Pangiri mana

b) Iluk

iv) a) What is the main reason for the large-scale destruction of mangrove biodiversity in the Negombo and Puttalam lagoons?

.....

b) Name the alien invasive plant that produces toxins that inhibit germination and seedling growth of plants

.....

v) a) What is known as 'Ozone depletion'?

.....

.....

b) Name **two** types of manmade industrial greenhouse gases with a very high global warming potential.

.....

.....

C) i) a) What are known as 'bioaerosols'?

.....
.....

b) State the carbon source and energy source used in the nutrition of purple non-sulfur bacteria.

Source of carbon -

Source of energy -

ii) a) State the reasons why viruses depend on the protein synthesis mechanisms of host cells.

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

b) Name one type of enzyme of microorganisms that is used to perform the following functions.

- Destroy host body tissues
- Change the metabolism of host

iii) a) What is considered as 'bio-fertilizers'?

.....
.....

b) Name a genus of free-living nitrogen-fixing bacteria that is present in high concentrations at rhizosphere.

.....

iv) a) What is the source of 'embryonic stem cells'?

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b) State the **two** main characteristics of 'human embryonic stem cells'.

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.....

v) a) Name the microbicide that has been developed using nanotechnology to prevent the entry of HIV and HSV to the body.

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b) Mention the scientific name of the parasite of filariasis.

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Part B - Essays

Instructions.

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

- (05) Introduce allosteric regulation of enzymes and briefly explain the mechanisms that regulate enzyme activity in a cell.
- (06) a) Briefly describe the type of cell that transports water and minerals in all vascular plants.
b) Describe the upward movement of water and minerals in plants.
- (07) Describe the structure of human skin and state its functions.
- (08) a) Explain the process of parturition of humans and the positive feedback mechanism associated with it.
b) Describe the temporary birth control methods commonly used by humans and their physiological processes.
- (09) a) Briefly describe the main enzymes used in gene technology and their functions.
b) Describe the applications of microorganisms in environmental management.
- (10) Write short notes on,
a) Tropical montane forests.
b) Cystic fibrosis
c) Preservation of food through radiation.