



Provincial Department of Education, Northern Province.
 மாகாணக் கல்வித் திணைக்களம், வடக்கு மாகாணம்.
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General Certificate of Education (Adv. Level) Fifth Term Evaluation - August 2024.

கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர) ஐந்தாம் தவணை மதிப்பீடு - ஆகஸ்ட் 2024.

Grade 13 (2024)

Biology I

09

E

I

Two hours

Instructions:

* Answer all questions.

* Write your **index number** in the answer sheet provided.

* In each of the question 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 (X)** on the number of the correct option.

Use blue or black ink pen for your responses.

1. The first formed organism on earth

- a) was formed around 3.8 billion years ago.
- b) was arose in the primitive soup.
- c) was anaerobic prokaryote.

Correct regarding the above

- 1) Only a
- 2) Only b and c
- 3) Only c
- 4) Only a and c
- 5) Only a and b

2. Which one of the following is correct regarding water?

- 1) It's a straight polar molecule.
- 2) Adhesion is the attraction found between water molecules due to hydrogen bonds.
- 3) Water has a high surface tension due to the adhesion between water molecules.
- 4) Water has the maximum density at 4⁰ C.
- 5) Substances can dissolve in water regarding its ionic nature.

3. Which one of the following statements is correct?

- 1) Adenosine is a nucleotide which produces ATP.
- 2) NADP⁺ functions as an oxidizing agent.
- 3) RNA is always a single stranded nucleic acid.
- 4) mRNA is the abundant RNA type in the cells.
- 5) GTP is a nucleotide and can provide energy.

4.

- a) Synthesis of glycolipids.
- b) Transport protein synthesized by bound ribosomes.
- c) Produce transport vesicles.
- d) Synthesis of glycoproteins.
- e) Carbohydrate metabolism.

Function / functions of both endoplasmic reticulum.

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

5. Correct statement regarding photosynthesis

- 1) Water splits during linear electron flow without the participation of enzymes.
- 2) 3-PGA is the primary product of photosynthesis in all plants.
- 3) Electrons from splitting of water are integrated in NADP⁺
- 4) Rubisco is only involved in the fixation of CO₂.
- 5) Malate is more stable compound than that of oxaloacetate.

6. Select the correct one regarding Krebs cycle.
- 1) One molecule of ATP is produced during this cycle by oxidative phosphorylation.
 - 2) In aerobic respiration, much amount of CO_2 is released in this cycle.
 - 3) 6 NADH and 2 FADH_2 are produced in this cycle.
 - 4) NAD^+ is reduced into NADH using energy by the breakdown of glucose.
 - 5) Citric acid is produced as primary product in this cycle regarding carboxylation.
7. Common characteristic to both Domain Archaea and Eukarya.
- 1) Sensitive to antibiotics.
 - 2) Eukaryotic cellular organization.
 - 3) Ability to fix nitrogen.
 - 4) Lack of branched lipids in the cell membrane.
 - 5) Lack of peptidoglycan in the cell wall.
8. Select the correct answer regarding the hierarchy of taxa.
- 1) Mammalia is the vertebrate phylum level.
 - 2) Crustacea is the invertebrate order level.
 - 3) *zeylanicus* is the species level.
 - 4) *Panthera pardus* is the species level.
 - 5) From Domain to species, the number of similar characteristics among the members in the taxa increases.
9. One of the characteristics of chlorophytes which were the ancestors of land plants.
- 1) Walled spores produced in sporangia.
 - 2) Chlorophyll a, b pigments.
 - 3) Dependent embryo.
 - 4) Apical meristem.
 - 5) Multicellular gametangia.
10. Correct regarding responses of plants which they get stimuli from the environment.
- 1) Canopy of the forest absorbs far red light rather than the red light.
 - 2) Red light inhibits seed germination in plants.
 - 3) Exposure to direct sunlight allows the plant to grow tall.
 - 4) Statolith play major role in negative geotropism.
 - 5) Far red light inhibits seed germination in plants.
11. Followings are plant growth regulators and their functions.

Plant growth regulators	function
A - Auxin	P - inhibits growth.
B – Gibberellins	Q – promote leaf abscission.
C - Cytokinin	R – stimulate stem elongation.
D - Absciscic acid	S – enhance apical meristem.
E - Ethylene	T - stimulate seed germination.

Select the correct combination regarding plant growth regulators – functions.

- | | | |
|----------------------------|-----------------------------|----------------------------|
| 1) A-R, B-P, C-Q, D-S, E-T | 2) A-P, B-R, C-P, D-T, E-Q | 3) A-S, B-R, C-T, D-P, E-Q |
| 4) A-R, B-R, C-P, D-T, E-Q | 5) A-S, B-T, C-R, D- Q, E-P | |

12. Deficient elements to plants that show wilting, as the deficiency symptom.

- | | | |
|--------------|-------------|-------------|
| 1) H and Mg | 2) Cl and N | 3) H and Cl |
| 4) Mn and Mo | 5) S and Cl | |

13. Photo synthetic, reduced and short-lived gametophytes found in
 1) Bryophytes. 2) Cycadophytes. 3) Gnetophytes.
 4) Anthophytes. 5) Pterophytes.
14. Collenchyma cells
 1) found in all vascular plants.
 2) provide mechanical support in roots.
 3) elongating with stems and leaves they mechanically support.
 4) have corners of cell walls are unevenly thickened with lignin.
 5) have only primary walls and are spherical.
15. a. influx of water b. decrease in water potential
 c. bending of inner wall d. increase in turgidity
 e. expansion of cells
 Correct sequential order of the above events from accumulation of K^+ into the guard cells and opening of stomata.
 1) b, d, e, a, e 2) a, b, c, d, e 3) c, d, a, e, b 4) b, a, d, e, c 5) c, d, e, a, b
16. Correct statement regarding bone.
 1) Canals are found at the edges of the osteon.
 2) It's a connective tissue which contains less minerals.
 3) Its matrix is only made up with collagen fibres.
 4) It's a specialised connective tissue.
 5) Central canal which is found at the centre of the osteon contains blood vessels and nerves.
17. Fibres in human food
 1) contribute to protect against cancers in the colon.
 2) are made up of polysaccharides and fatty acids.
 3) are used to synthesis fibrous connective tissues.
 4) aid in the absorption and use of calcium and phosphorous.
 5) act as a carbon source needed for metabolism.
18. Select the correct statement regarding human heart.
 1) Its outer layer is serous pericardium.
 2) Endocardium consists of cuboidal epithelial cells.
 3) Endometrium is continuous with the lining of the blood vessels.
 4) Cardiac muscles in the inferior part of the heart are thicker than that of the superior part.
 5) Tricuspid valve is found in the left side of the heart.
19. Some lung volumes and capacities of an adult person are as follows:
 * Tidal volume = 500 ml.
 * Expiratory reserve volume = 1500 ml.
 * Vital capacity = 4800 ml.
- Inspiratory reserve capacity of this person is (in ml)
 1) 2800 2) 3300 3) 4300 4) 2000 5) 3800
20. Which one of the following statements is correct regarding defence mechanisms in human body?
 1) Inflammatory response is one of the types of a barrier defence in innate immunity
 2) No involvement of phagocytic cells in inflammatory responses.
 3) Interferons are secreted by the healthy phagocytic cells which are found in the blood.
 4) Complementary proteins are found in the plasma membrane of body cells.
 5) Blood loss is decreased due to the constriction of blood vessels by the release of histamine, when the tissues get damaged.

Joint	Location
A. Hinge joint	Between thoracic vertebrae and the ribs.
B. Pivot joint	Between cranium and atlas.
C. Ball and socket joint	Between scapula and head of the humerus.

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

- 1) ADH is produced by the posterior pituitary gland.
- 2) Prolactin is a tropic hormone secreted by anterior pituitary gland.
- 3) Nor-adrenalin mediates long term stress responses.
- 4) Removal of thyroid gland will affect the maturation of T-lymphocytes.
- 5) Glucocorticoids promote the production of glucose from fats.

- 1) Most of the smooth muscle in the ciliary body are radial.
- 2) Choroid which found in the anterior and lateral sides of the eye ball are opaque.
- 3) Cornea and iris cover the anterior portion of the eye ball.
- 4) Aqueous humour is secreted by the cornea.
- 5) Inner most portion of the retina is the pigmented epithelium.

- 1) It stimulates the Leydig's cells to provide nourishment to developing sperms.
- 2) Inhibin stimulates the posterior pituitary to inhibit the secretion of FSH.
- 3) FSH level would be low than that of the normal range during ovulation.
- 4) Estradiol level influences in the level of FSH.
- 5) FSH stimulates the growth of follicles seven days after puberty.

- 1) During resting potential, inside of the cell is positively charged whereas exterior is negatively charged.
- 2) During resting potential, potassium channels allow net out flow of K^+ due to chemical concentration gradient.
- 3) Conduction through pumps is a passive process.
- 4) A change in the cell's membrane potential below certain value increases the action potential.
- 5) Resting potential is typically between 60mV and 80mV.

- 1) The actin filaments are attached with Z lines.
- 2) M line is attached only with thin filaments.
- 3) Thick filaments are located at the edges of the sarcomere.
- 4) Thin filaments are located at the centre.
- 5) Sarcomere is found in all muscle tissues.

- 1) acts as the input centre of sensory information.
- 2) controls autonomous nervous system.
- 3) coordinates running.
- 4) controls vomiting.
- 5) aids in the balance.

28. Correct regarding IVF and ICSI

- 1) In ICSI, embryo is implanted in the uterus at seven cell stage.
- 2) In ICSI, one sperm is obtained and inserted into the woman's body.
- 3) In ICSI, one spermatid nucleus is injected per oocyte.
- 4) In IVF, for acrosome reaction one sperm is injected.
- 5) ICSI is an out-breeding process.

29. Epididymis in human

- 1) nourishes spermatids and sperms.
- 2) contributes the bulk of the content of semen.
- 3) produces anticoagulants.
- 4) secretes alkaline mucus.
- 5) stores sperms.

30. In a plant, one-pod condition (P) is dominant to the three-pod condition (p) and normal leaf (L) is dominant to wrinkled leaf (l). Pod type and leaf type are inherited independently.

Determine the genotype for two parents for all possible mating producing the following offsprings:

- One pod, normal leaf - 150
- One pod, wrinkled leaf- 147
- Three pod, normal leaf - 51
- Three pod, wrinkled leaf- 48

1) ppLl X PPLl

2) PpLl X PpLl

3) PPLL X ppll

4) PpLl X Ppll

5) ppll X PpLl

31. Which one of the following statements is correct?

- 1) F_1 generation is always homozygous, that form from two pure line parents.
- 2) Polyallelic inheritance produces only four genotypes.
- 3) Epistasis results from interactions between genes of different loci.
- 4) Incomplete dominance and codominance have the same ratio of 1:2:1 which deviate from Mendel's second law.
- 5) Human skin colour is the example for polygenic inheritance which is qualitatively measured.

32. A fruit fly of genotype GgNn crossed with a fruit fly of genotype ggnn and the next generation resulted as follows:

Genotype	Frequency
GgNn	50%
ggnn	50%

The above genes are linked and if crossing over and thereafter independent assortment is taken place, the combination of resulted genotypes of the above cross.

- 1) GgNn and ggnn.
- 2) Only GgNn.
- 3) GgNn, ggnn, ggNn and Ggnn.
- 4) GGNN, GgNn and ggnn.
- 5) GGNN and ggnn.

33. Enzyme catalyses the formation of peptide bond between two amino acids during translation,

- 1) helicase
- 2) rRNA
- 3) primase
- 4) DNA polymerase
- 5) RNA polymerase

34. The reason for using phenol in the isolation of DNA.

- 1) To remove RNA contaminants with DNA.
- 2) To precipitate the DNA.
- 3) To dissociate the proteins with DNA.
- 4) To prevent DNase enzymes, get touch with DNA.
- 5) To break down the bacterial cell wall.

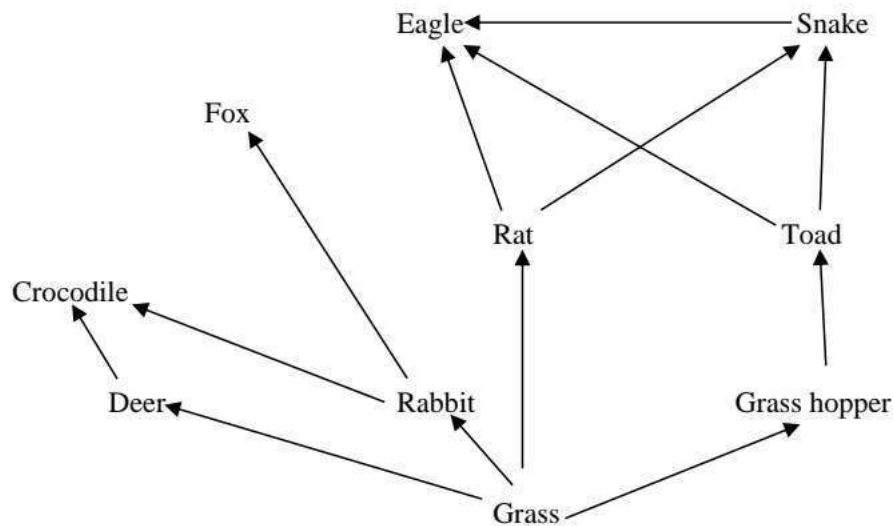
35. Agarose Gel Electrophoresis

- 1) is a technique that separates neutral molecules in an electric field.
- 2) can be separate single stranded from other strands.
- 3) contains wells for loading at anode regions.
- 4) allows to visualizes separated DNA strands with ethidium bromide stain.
- 5) move more charged molecules faster than that of less charged molecules.

36. Personalised medicine

- 1) which is based on genetic information of the patient to treat diseases.
- 2) is used to control diseases by vectors.
- 3) is sterile insect technology.
- 4) can be treated to heart attack and stroke patients.
- 5) found in edible vaccines.

37.



The number of primary and secondary consumers in the above ecosystem are respectively

- 1) Four and three.
- 2) Two and five.
- 3) One and five.
- 4) Four and five.
- 5) Five and four.

38. Abundant plant variety found in villus ecosystem in Sri Lanka.

- 1) Citronella grass
- 2) Sedges
- 3) Cogon grass
- 4) *Colocasia*
- 5) *Halodule*

39. Select the correct statement.

- 1) Key stone species is a species chosen as a symbol to represent an ecosystem in needful for conservation.
- 2) Indian Pita is an exotic species.
- 3) *Salvinia* can be a threaten species to the native biodiversity.
- 4) Snake head is a marine and migratory species.
- 5) Kittul / Thippilipanai is an endemic species.

40. Followings are some global effects.

- a) Spreading of Dengue increases.
- b) Increase in skin cancer.
- c) Increase in landslides.
- d) Extinct of some species.
- e) Increase of heavy metals in drinking water.

Impacts can be observed in our country if the greenhouse gas emissions are not controlled.

- 1) Only a and d
- 2) Only a and c
- 3) Only b, c and e
- 4) Only a, c and d
- 5) Only c, d and e

- 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 summarized				
1	2	3	4	5
(A), (B), (D) Correct.	(A), (C), (D) Correct.	(A), (B) Correct.	(C), (D) Correct.	Any other responses or combination of responses Correct.

41. Correct response / responses regarding co-factors.
- They are non-proteinous components.
 - All are organic compounds.
 - They can be bind with temporarily with enzyme molecules.
 - They can be bind with permanently with enzyme molecules.
 - They always needed to enzyme activities.

42. Following are some characteristics and protists.

Characteristic	Protista
P- Cellulose in cell wall	W – <i>Sargassum</i>
Q- Multicellular thallus	X - <i>Amoeba</i>
R- Contractile vacuole	Y – Diatom
S- Chlorophyll C	Z - <i>Ulva</i>

Select the correct combination / combinations regarding character - Protista.

- P-Z, Q-W, R-X, S-Y.
 - P-W, Q-Z, R-X, S-W
 - P-Y, Q-W, R-Z, S-W
 - P-W, Q-W, R-Y, S-Y
 - P-X, Q-Z, R-X, S-W
43. Which of the following is/are correct regarding life cycles of plants?
- Gametophytes of *Pogonatum* is dioecies and long lived than their sporophytes.
 - Cuticle is found in the areal parts of sporophytes of *Nephrolepis*.
 - Selaginella* bears heterophyll leaves and ovules.
 - Anthophytes contains highly reduced male gametophyte which is found within the pollen grain.
 - Cycas* need external water for fertilization.
44. In the distal convoluted tubules of human nephron,
- reabsorption of Na^+ increases with the influence of ADH.
 - reabsorption of water occurs under the influence of aldosterone.
 - reabsorption of K^+ occurs under the influence of aldosterone.
 - reabsorption water increases with the influence of ADH.
 - HCO_3^- is secreted while H^+ ions are reabsorbed.

45. In the female reproductive system,
- A. progesterone level is high during the middle of the luteal phase.
 - B. estradiol is very low at the beginning of the proliferative phase.
 - C. LH is high during the secretory phase.
 - D. after ovulation LH stimulates the follicular cells to transform into corpus luteum.
 - E. LH is high during the menstrual phase.
46. Select the correct response / responses.
- A. Gene cannot be expressed when one allele is present in the gene.
 - B. As a result of interactions among alleles, sometimes one character is formed.
 - C. **Aa** genotype represents the identical nucleotides sequences in the homologous chromosomes.
 - D. In ABO blood grouping system, three alleles are present in that particular genetic locus.
 - E. The alternative version of an allele is the chromosome.
47. Correct response / responses regarding human gene mutations.
- A. Sickel cell anaemia is a missense mutation.
 - B. Point mutations occur due to the substitution of one pair of nucleotides with another pair.
 - C. Haemophilia occurs due to deletions.
 - D. Colour blindness occurs due to the translocation of seventh chromosome.
 - E. The ploidy level can be changed due to nondisjunction.
48. Correct combination / combinations regarding some process in DNA recombinant technology and enzymes.
- A. Formation of cDNA - reverse transcriptase
 - B. Opening of cloning site - T_4 DNA ligase.
 - C. Purification of DNA sample - RNase.
 - D. Formation of recombinant DNA - DNA ligase
 - E. PCR - primase.
49. In which of the following / followings shows / show biomes in the decreasing range of order of average temperature?
- A. Desert, temperate grass land, chaparral, savanna.
 - B. Northern coniferous forest, tundra, savanna, tropical rainforest.
 - C. Chaparral, tropical rainforest, savanna, tropical broad leaf forest.
 - D. Desert, Northern coniferous forest, savanna, tropical broad leaf forest
 - E. Tundra, Northern coniferous forest, tropical broad leaf forest, chaparral.
50. Characteristic/ characteristics of tropical wet low land rain forest ecosystem.
- A. Mean annual average rain fall is 2000 - 5000 mm.
 - B. Mean annual average temperature is 33°C .
 - C. Presence of epiphytic populations.
 - D. Found below 900 m elevation from sea level.
 - E. Trees accommodate the strong winds that prevails.





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General Certificate of Education (Adv. Level) Fifth Term Evaluation – August 2024.

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Grade 13 (2024)

Biology II

09

E

II

Time: Three hours

Additional reading time 10 minutes.

Index No:

- ❖ Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Instructions:

- ❖ This question paper consists of **10** questions in **11** pages.
- ❖ This question paper - **Part II** comprises Part **A** and **B**. The time allotted for **both parts** is **three hours**.

Part A – Structured essay (Pages 2 – 10)

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

Part B – Essay (Page 11)

- * Answer **four** questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, before handing over to the supervisor tie the two parts together so that **Part A is on the top of Part B.**

- * You are permitted to take only **Part B** of the question paper from the examination hall. (**Detach it**)

For examiners' use only

Total Marks

Part	Question. No	Marks
A	1	
	2	
	3	
	4	
B	5	
	6	
	7	
	8	
	9	
	10	
Total		

In Numbers	
In Letters	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks Checked by	
Supervised by	

Part II A – Structured essay❖ **Answer all questions in this paper itself.****(Each question carries 100 marks)**

1.

A. (i) What are disaccharides?

.....

.....

(ii) Give two functions of disaccharides.

.....

.....

(iii)**(a) Name the chemical groups of phospholipids that makes the hydrophilic head.**

.....

(b) How unsaturated fat differs from saturated fat?

.....

(iv) Which are the physical agents that make the denature of proteins?

.....

(v) Indicate the mitotic phase for each of the following events.**a. Kinetochore attaches the sister chromatids.**

.....

b. Spindle microtubule depolymerizes.

.....

(vi) a. What is malignant tumour?

.....

b. How do you indicate the spread of cancer cells to locations distant from their original site?

.....

B.**(i) Give the basis for present system of classification.**

.....

.....

.....

(ii) a. Which group possess book lung that could be included in the phylum Arthropoda?

.....

b. Which of the animal phylum consists of only marine habitat?

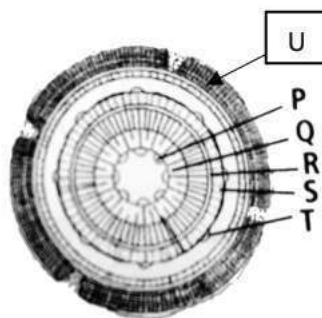
.....

(iii) Complete the following dichotomous key to distinguish the plant species given below.

Pogonatum, Nephrolepis, Cucurbit, Cycas, Coconut, Marchantia

1. Vascular tissue present
Vascular tissue absent.
2. "stem" "Leaf" present
"stem" "Leaf" absent
.....
3. Homo spores present
Homo spores absent
.....
4. Cone present
Cone absent
.....
5. Pollen grain contain three pores
Pollen grain do not contain three pores

C. (i)



Identify the above diagram.

(ii) Name P, Q, R and S.

P..... Q.....
R..... S.....

(iii) Briefly describe the structure found in U for the gaseous exchange.

(iv) What is water potential?

(v) What is the water potential value of pure water?

(vi) Which light receptor is responsible for the slowing down of hypocotyl elongation during seedling development?

2)

A. (i) a. Indicate a glycoprotein which is found in the mucus of saliva.

.....

b. Which substance is secreted from the chief cell of the stomach?

.....

(ii) Which blood vessel transports nutrient rich blood to the liver?

.....

(iii) Which are the lymph organs?

.....

(iv) What are the functions of human lymphatic system?

.....

.....

(v) To which the AV valves are attached? What is the function of them?

.....

.....

(vi) What is the function of ions that dissolves in human blood plasma?

.....

B (i). (a) What is respiratory pigment?

.....

.....

.....

(b) Name a respiratory pigment found in both vertebrates and invertebrates.

.....

(c) In which component CO_2 is attached with haemoglobin and transported as carbamino haemoglobin?

.....

(ii) Give **two** locations in human body where the receptors found to sense lowering blood pH.

.....

(iii) Which lung capacity enable the human lungs for continuous exchange of gas with the blood in the alveoli?

.....

(iv) Which are the **two** membranes found in the wall of the human lungs?

.....

Do not write
in this
column.

- (vi) To which, the additional muscles may be used to aid in breathing, other than intercostal muscles and diaphragm?

- (vi) Which is the main causative for lung cancer?

C (i) Indicate the inflammatory signaling molecules and give its function.

- (ii) What are antigens?

- (iii) What is the difference between naturally acquired active immunity and artificially acquired active immunity?

- (iv) Briefly describe the Type I diabetes mellitus.

- (v) Which molecules are **not** transported into the Bowman's capsule during ultra filtration?

- (vi) What is secretion in the formation of process of urine?

- (vii) Where the reabsorption of urea takes place in human kidney?

- (viii) Which substances are eliminated during dialysis in the patients with kidney failure?

3.A

- (i) Which **three** layers of tissue found in the human central nervous system?

(ii) What is sensory adaptation?

.....

(iii) a. Which is a non-tropic hormone of anterior pituitary?

.....

b. How osmotic balance achieved in human body?

.....

.....

(iv) Name the visual pigment of cones.

.....

(v) Which are the parts of middle ear?

.....

.....

(vi) Name the hormone / hormones responsible for the following functions in human.

a) Maintenance of blood calcium level

b) Enhance spermatogenesis

c) Development of corpus luteum

(vii) Name the ovarian hormone which is prominent in each of the following phases of menstrual cycle in females.

Proliferative phase

Secretory phase

B. (i) Write the early fetal sites of the following human fetal parts.

a) **Bladder**

b) **Developing gonads**

(ii) Indicate the exact part of the mother and fetus where the exchange of materials takes place in placenta.

Mother

Fetus

(iii) How Intra cytoplasmic sperm insemination (ICSI) differs from invitro fertilization (IVF)?

.....

(iv) Which are the vertebrate organisms that show parthenogenesis?

.....

(v) How morula stage gets its nourishment?

.....

(vi) What are the **three** stages of parturition?

.....

.....

.....

(vii) Indicate **two** proteinuos nutrient components found in human milk.

.....

C (i) Which bones gets muscle attachment where they involve in the movement of lower jaw?

.....

(ii) Which bones are responsible for resonance to voice other than the bones only involved in the formation of cranium.

.....

(iii) Write whether the following statement is correct as "**correct**" and is wrong as "**wrong**" regarding the sliding filament theory of skeletal muscle contraction.

a. Binding of a new ATP is essential for the detachment of myosin heads from cross bridges. (.....)

b. The lengths of actin and myosin remain constant during muscle contraction. (.....)

(iv) Indicate **one** characteristic of all cervical vertebrae to distinguish them from other vertebrae.

.....

(v) Name **two** main joints in the human upper arm.

.....

.....

(vi) What is slipped disc?

.....

.....

4. A

(i) According to current knowledge, Mendel's second law of inheritance applies to two circumstances only. Give such **two** circumstances.

.....

.....

(ii) Indicate the major difference between incomplete dominance and codominance.

.....

.....

(iii) a. What is dominant epistasis?

.....

.....

- b. The gene “C”/ “c” is responsible for producing colour in the feathers.

The dominant “C” allele produces colour while the recessive “c” allele result in the absence of pigmentation. The gene “I” is epistasis to gene “C” and suppress the expression of the colour. Recessive allele “i” is unable to prevent colouration.

Give the phenotype of the each of the following genotypes.

a. CcIi

b. Ccii

- (iv) What is hybrid vigour?

.....

.....

.....

B

- (i) a. Following is the base sequence of a coding strand of a DNA molecule.

ATGCGAATTCGTTTTTACCTATAGGGTAG

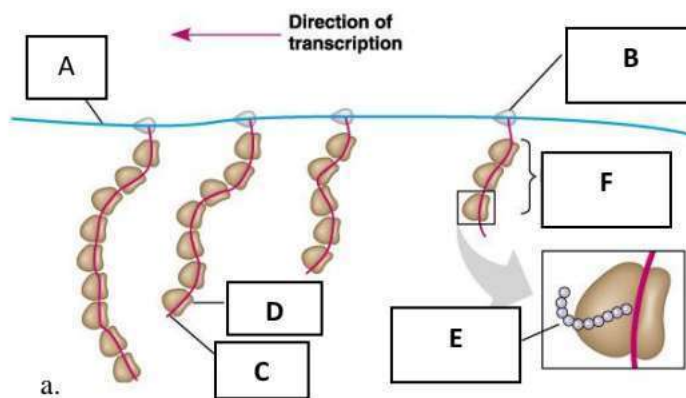
Write the base sequence of the mRNA to be transcribed from the above DNA molecule.

.....

- b. How many amino acids can be translated from the above sequence?

.....

- (ii)



- a. Name the alphabets denoted in the above diagram.

A..... B.....

C..... D.....

E.....

- b. What is the significance of F?

.....

- (iii) What is meant by vector in recombinant DNA technology?

.....

.....

- (iv) a. Which microorganism can mostly be used as a vector in eukaryotic system?

.....

- b. What are the characteristics can be found in the microorganism, above-mentioned in (iv) a, that could be act as a vector?

.....

.....

- (v) Name the organism that can be used to insert Bt. gene into the GM crops.

.....

- (vi) What is sterile insect technology (SIT)?

.....

- (vii) Indicate an international and national actions for protection of potential risks from genetically modified organisms.

a. **International action**.....

b. **National action**.....

C

(i)

- a. Name a Sri Lankan coastal ecosystem which is considered as “rain forests of the sea” and give the reason for that consideration.

.....

- b. Give **two** plant varieties that could be found in a distance away from the tide mark of the sea shore.

.....

- (ii) a. One of the threads to biodiversity is over exploitation. What is over exploitation?

.....

.....

b. Name a plant species which was overexploited from the colonial period.

.....

(iii) What is habitat?

.....

.....

(iv) a. A population of species in an ecosystem of Sri Lanka, have been categorized in the vulnerable status, became decreased recently. In which of the category of IUCN Red Data Book, the above species then can be categorized?

.....

b. Name a plant and an animal which can be included under the above mentioned category in (iv) a.

Animal

Plant

(v) What are the objectives of MARPOL convention?

.....

.....



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Grade 13 (2024)

09 E II

Biology II

Part B – Essay

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

05. a. Briefly describe the mechanism of enzyme action.
 b. Briefly describe the oxidative phosphorylation reactions that occur in the mitochondria.
06. a. Briefly describe the phloem tissue cell types that could participate in the phloem translocation.
 b. Describe the mechanism of phloem translocation.
07. a. Briefly describe the histological structure of human liver.
 b. Briefly describe how the humoral immune responses act against antigens.
08. Describe the human inner ear and briefly describe the contribution of it in the maintenance of equilibrium.
09. a. Briefly describe the role of DNA probes in hybridization.
 b. Briefly describe the tropical wet low land rain forest.
10. Write short notes on the followings:
 - a. Dihybrid test cross.
 - b. Restriction sites.
 - c. Conservation.

