WWW.ALEVELAPI.COM

G.C.E. (A/L) Examination - 2018

09 - Biology

Distribution of Marks

- **Paper I - 1 x 50 = 50**

Paper II

Part A - Structured Essay (Answer all four questions)

Question No. 01	-	100
Question No. 02	-	100
Question No. 03	-	100
Question No. 04	-	100

100 x 4 = 400

Part B - Essay (Answer four questions only)

Question No. 05	-	150
Question No. 06	-	150
Question No. 07	-	150
Question No. 08	-	150
Question No. 09	-	150
Question No. 10	-	150

150 x 4 = 600

Total Marks = 400 + 600 = 1000

Paper II Final Marks = 100

උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்

අ.පොස. (උ.පෙළ) විභාගය/ க.பொ.த. (உயர் தர)ப் பரீட்சை - 2018

විෂය අංකය பாட இலக்கம்	09	විෂයය பாடம்	BIOLOGY

ලකුණු දීමේ පටිපාටිය/புள்ளி வழங்கும் திட்டம்

I පත්‍රය/பத்திரம் I

ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.
01.	4	11.	2	21.	1	31.	2	41.	3
02.	4	12.	5	22.	3	32.	3	42.	4
03.	5	13.	Any	23.	5	33.	1	43.	3 or 5
04.	2	14.	5	24.	3	34.	4	44.	5
05.	5	15.	3	25.	4	35.	3	45.	5
06.	2	16.	5	26.	3	36.	3	46.	1 or 5
07.	3	17.	2	27.	5	37.	4	47.	2
08.	4	18.	4	28.	4	38.	2	48.	5
09.	4	19.	4	29.	3	39.	3	49.	4
10.	2	20.	4	30.	4	40	1	50	3

✪ විශේෂ උපදෙස්/ விசேட அறிவுறுத்தல் :

එක් පිළිතුරකට/ ஒரு சரியான விடைக்கு 02 ලකුණු බැගින්/புள்ளி வீதம்

මුළු ලකුණු/மொத்தப் புள்ளிகள் 2 × 50 = 100

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

Part A - Structured Essay

1. (A) (i) Following are some of the characteristics seen in living organisms. Explain what is meant by each of these characteristics.

(a) Growth

An irreversible increase in dry mass of organisms — 1pt

(b) Development

Irreversible changes that occur during the life span of an organism — 1pt

(c) Reproduction

Ability to produce new offspring for continuous existence of species /
Production of new generation of individuals of the same species — 1pt

(ii) There are four main types of organic compounds found in organisms. State the mostly found main type of organic compound in each of the following.

additionaly write wrong.

(a) Egg White:	Protein	1pt
(b) Coconut milk:	Lipid	1pt
(c) Primary cell walls:	Carbohydrate	1pt
(d) Arthropod exoskeleton:	Carbohydrate	1pt

(iii) Name a laboratory test used to identify the following. If additional answers are written answer is incorrect.

(a) Main type of organic compound found in egg white
Biurrete test — 1pt

(b) Main type of organic compound found in coconut milk
Sudan III test — 1pt

(c) Main storage substance of Chlorophyta
Iodine test — 1pt

(d) Reducing sugars
Benedict test — 1pt

(B) (i) Name four monosaccharides according to the number of carbon atoms and give an example for each of them.

	Monosaccharide	Example	
(a)	Triose	Glyceraldehyde	1+1pt
(b)	Tetrose	Erythrose	1+1pt
(c)	Pentose	Ribose / Ribulose / Deoxyribose	1+1pt
(d)	Hexose	Glucose / Fructose / Galactose	1+1pt

0 marks only mark example written.

Monosaccharide should be written. If examples are given without name no marks.

(ii) What is a disaccharide?

A (Sugar) molecule formed when two molecules of monosaccharides are joined by a glycosidic bond — 1pt

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(iii) (a) State the common characteristic of all monosaccharides and some disaccharides.

Reducing nature 1pt

(b) Describe a simple laboratory test used to identify sugars with the characteristic stated as the answer for (iii) (a) above.

- Take aqueous solution of sugar and
- Add an equal volume of Benedict's solution, mix well
- and boil (in a water bath) / Heat
- Brick red coloured precipitate is formed 4pts

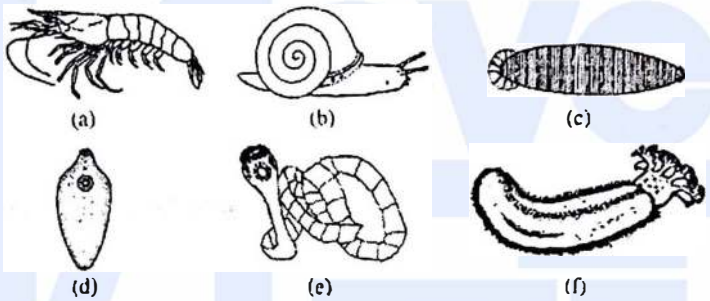
(C) (i) State the generic names of two homosporous, seedless plants with vascular tissues.

- *Nephrolepis*
- *Lycopodium*

Scientific naming is essential Specific epithet is important

2pts

(ii)

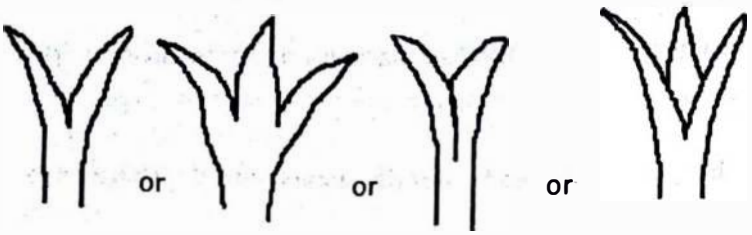


Complete the following dichotomous key using appropriate numbers and letters to distinguish the animals shown in the diagrams (a)-(f) above.

(1) Tentacles present		5	1pt
Tentacles absent		2	1pt
(2) Suckers present	3		1pt
Suckers absent	a		1pt
(3) Hooks present	e		1pt
Hooks absent		4	1pt
(4) Segmented body		c	1pt
Unsegmented body		d	1pt
(5) Large foot present		b	1pt
Large foot absent		f	1pt

(iii) Structures known as pedicellaria are present in some echinoderms such as starfishes. Draw the external appearance of a pedicellaria.

උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දේ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...



1pt

(iv) Name two classes of phylum Echinodermata that do not have pedicellaria.

- Ophiuroidea
- Holothuroidea
- Crinoidea

Sinhala / - Sinhala or English names are accecepted (allocated). any 2 2pts

Total 40 x 2½ marks = 100 marks

2. (A) (i) Name a class which has animals with an incomplete alimentary canal other than coelenterates and flatworms.

Ophiuroidea 1pt

(ii) (a) What is radula?

(Chitinaceous) structure/ band with minute teeth found in the mouth / mouth cavity of some mollusks 1pt

(b) What is the use of radula?

Scraping food 1pt

(iii) (a) Why are some plants insectivorous?

To obtain nitrogen (required by them) 1pt

(b) State the generic name of an insectivorous aquatic plant.

Utricularia Scientific name should be. 1pt

(iv) (a) Write in correct order, the passage of air from outside to alveoli in man.

alviolia.

nostrils, nasal cavity, pharynx, larynx, trachea, bronchus, bronchiole, alveolar duct

Terminal bronchiole, bronchiole or duct can give mark. Terminal bronchiole } part respiratory bronchiole 1pt

(b) What is the role of goblet cells present in human respiratory tract?

Secretion of mucous 1pt

(v) (a) What is respiratory cycle?

Pause

One inspiration, one expiration and period after expiration until the start of the next inspiration.

pause c. definition for pause. expiration.

1pt

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(b) What is the volume of air that enters the respiratory system during one normal respiratory cycle of a healthy adult man at rest?

450 ml / 500 ml / cm^3 ml = cm^3. no other answers. 1pt

B) (i) (a) What is meant by ultrafiltration that takes place during urine formation?

Filtration of blood under high pressure from glomerulus to the Bowman's capsule

1pt

(b) Name an ion that is secreted into the lumen of human nephron.

H^+ / K^+ / NH_4^+ one of this any 1 1pt

(ii) State three functions of human kidney other than urine formation.

- Osmoregulation/ maintaining the constant osmotic pressure in the blood
- Secretion of hormone /Erythropoietin
- Regulation of blood pH
- Maintenance of blood volume / Regulation of blood volume
- Maintenance of blood pressure Regulation

any 3 3pts

(iii) Name the skin receptors involved in thermoregulation in man.

- Ruffini corpuscles/ bodies
- Krause end bulbs
- Free nerve endings

No deduction for extra answers. 3pts

(iv) (a) What is the functional unit of human liver?

(Liver) lobules 1pt

(b) State four homeostatic functions of human liver.

- Regulation of blood glucose level
- Regulation of lipid content in blood.
- Synthesis of non-essential amino acids
- Detoxification
- Heat production
- Breakdown/ elimination of (sex) hormones
- Breakdown/ elimination of haemoglobin
- Storing blood
- Storing vitamins (A, E, K and D)
- Synthesis of blood proteins
- Synthesis of cholesterol
- Urea production

any 4 4pts

Alevel lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(v) (a) What are the three factors that contribute to the resting membrane potential of neurons?

- Differences in the concentrations of specific ions inside and outside the cell (membrane)
- Selective permeability of plasma membrane for K^+ ions and Na^+ ions
- Na^+ K^+ pump

3pts

(b) Which lobe of the human cerebrum controls muscle movement needed for speech?

Frontal (lobe)

1pt

(C) (i) (a) What is a hormone?

- A chemical (messenger) secreted/released by endocrine glands into blood — 1
- which acts (usually) on a distant organ to modify its physiology/ function. — 1

2pts

(b) Where does ADH act on the kidney tubules of man?

- Distal convoluted tubule
- Collecting duct

2pts

(ii) State two main differences between nervous coordination and endocrine coordination.

- Pathway is specific in nervous coordination; Pathway is not specific in endocrine coordination (both sides are needed in comparision)
- Nervous coordination is chemical and electrical; Endocrine coordination is chemical
- Nervous coordination is rapid / rapid response; Endocrine coordination is slow / slow response
- Response is often localized in nervous coordination; Response may be diffused / widespread in endocrine coordination.

(Both conditions have to be written) any 2 2pts

(iii) (a) Briefly describe what are known as sinuses located in some bones of the human skeleton.

Air filled cavities/ sacs/ spaces lined with ciliated mucous membrane

1pt

(b) Name a bone that contains sinuses but does not take part in the formation of human cranium.

Maxillary (bone)

1pt

Alevel Apt උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(iv) State two functions of sinuses.

- Give resonance to the voice
- Lighten the bones of face / skull / cranium
- Make it easier for the head / skull to balance on top of the vertebral column

any 2 2pts

(v) Name the two processes found in human mandible and state the function of each of them.

Process	Function – any function nos marks.
Condyloid process	Articulates with the temporal bone 2pts
Coronoid process	Gives attachment to (muscles and ligaments) 2pts

only process put marks. No marks only for functions.

Total 40 x 2½ marks = 100 marks

3. (A) (i) State the location of the pacemaker in the human heart.

On the wall / myocardium of right auricle close to the opening of the superior vena cava

1pt

(ii) Name the arteries that arise first from the aorta and state the structure to which they supply blood.

Arteries	Structure
Coronary arteries	Heart 1+1 2pts

No marks only for structure.

(iii) State how blood circulatory system contributes to maintain constant body temperature in man.

- Transfer heat from active tissues
- constriction and dilation of skin blood vessels 2pts

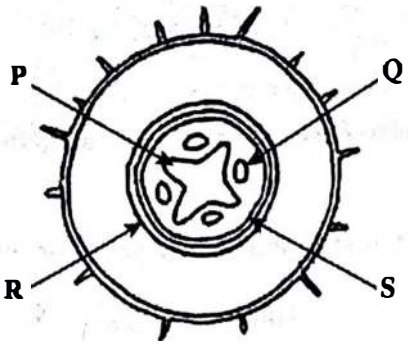
(both should be there).

(iv) Considering the ABO blood groups and Rh factor, state the blood groups of the following persons

Universal donor	O^- 1pt
Universal recipient	AB^+ 1pt

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දේ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(B)



(i) Identify the structure shown in the above diagram.

T.S./ C.S. of a primary dicot root 1pt

(ii) (a) Name the tissues labeled as P, Q, R and S in the above diagram.

P - (Primary) xylem Q - (Primary) phloem

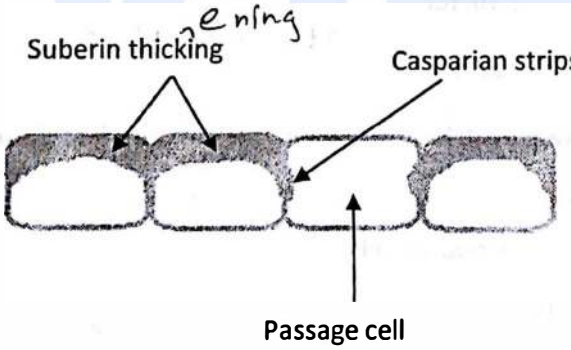
R - Endodermis S - Pericycle 1 pt each 4pts

If wrt secondary xylem/ phloem, no marks, if sts are written no marks

(b) What is the tissue of the above diagram that appears in red when stained with Safranine?

Xylem 1pt

(iii) Draw and label a few cells of tissue R when it is at matured stage.



drawing correctly = 01 pt
each labeling = 01 pt.

Correct diagram 1pt + 1 pt each for labeling 4pts
(Incorrect diagram or no labeling – No marks)

(iv) What are the features of gymnosperms that enable them to be more successful on terrestrial habitats than bryophytes?

- Presence of well differentiated roots, stem and leaves
- Presence of vascular tissues/ xylem and phloem / presence of supportive tissues
- Presence of seeds
- (Diploid) sporophyte is dominant
- Presence of cuticles (on leaves/ aerial parts of the plant)
- Not dependent on external water for reproduction/ fertilization

any 5 5pts

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(v) **State three uses of plant tissue culture other than the propagation of plants with desired characters.**

- Cryopreservation of germplasm
- Producing genetically modified plants
- Obtaining haploid plants
- Obtaining disease free plants

any 3 3pts

(C) (i) **What is the main purpose of examining a bacteria smear stained with methylene blue under high power of a light microscope.**

Observing (basic) shape 1pt

(ii) (a) **Name the forms of arrangement of cells of cocci shown in the diagrams A—D ~~write~~ given below.**



A - Cocci (කොච්චි)
B - Tetrad
C - Streptococci
D - Staphylococci

(1 point each) 4pts

(b) What are the two types of arrangement of cells of bacilli?

- Diplobacili
- Streptobacilli

2pts

(iii) (a) **What are prions?**

- Protinaceous infectious particles

1pt

(b) How could prions be transmitted from human to human?

- During transplanting of tissues / organs
- Transfusion of contaminated blood

2pts

(iv) **Some microorganisms in the normal microbiota of humans may become pathogenic when general resistance of the body is lowered. How are these microorganisms called?**

Opportunistlc pathogens 1pt

(v) **Give four reasons for lowering the general resistance of the human body against microbial infections.**

- Exhaustion
- Prolonged use of antibiotics
- Use of immune suppressive drugs
- Stress
- Malnutritlon
- Use of narcotics

any 4 4pts

Total 40 x 2½ marks = 100 marks

උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

4. (A) (I) (a) What is placenta?

A structure formed between the mother and the foetus (mainly) for exchange of materials (between mother and foetus). 1pt

(b) What is the type of placenta found in humans?

Deciduous alanto-chorion placenta 1pt

(ii) (a) Name a material that passes from mother to foetus and from foetus to mother through placenta.

Water / H_2O 1pt

(b) Name a virus that can pass from mother to foetus through placenta.

Hepatitis B/ Rubella / HSV · HIV 1pt

(iii) (a) Name a hormone secreted only by the human placenta.

Human placental lactogen/ ~~hCG (Human chorionic gonadotrophin)~~ 1pt

hPL β-hPL

(b) State two functions of placenta other than hormone secretion and exchange of material between mother and foetus.

- Attachment of foetus to mother
- Prevention from coagulation of blood due to Rh factor of different blood groups
- Protection from relatively high blood pressure of maternal circulation
- Acting as a barrier for certain materials any 2 2pts
- produce prostaglandins.

(iv) (a) What is lactation?

Synthesis and release of milk 1pt

(b) Name two hormones that are directly involved in lactation.

- Prolactin
- Oxytocin

If excess incorrect answers are written can give marks. 2pts

(v) What is the reason for menopause?

- Ovaries become less sensitive to FSH and LH 1pt

(B) (i) Where does oxidative phosphorylation take place in an eukaryotic cell?

- Inner membrane / cristae of mitochondria 1pt

(ii) State the events that take place during oxidative phosphorylation in a eukaryotic cell.

- Oxidation of reduced co-enzymes
- ATP formation / Conversion of ADP to ATP
- ~~Hydrogen~~ accepted by molecular oxygen
- forming water
- Electrons transported through electron carriers 5pts

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(iii) **Name three enzymes involved in DNA replication and state one function of each of them.**

Enzyme	Function	
(DNA) Helicase	uncoiling/unwinding/unzipping of DNA	2pts
DNA polymerase	Synthesis/ Polimerization of new complementary DNA strand (synthesis new DNA strand.)	2pts
(DNA) Ligase	Joining DNA fragments	2pts

No marks, only function.

(iv) **State three traits introduced to agricultural crops by genetic modification for crop protection.**

- Pest resistance
- Climate tolerance
- Disease resistance
- Weedicide resistance

3pts

(C) (i) **Why is it important to study environmental science?**

- Today mankind is faced with many environmental issues
- They are increasing / growing and
- become more and more complex day by day
- To make effective suggestions for these and
- to take remedial actions

5pts

(ii) **What is in-situ conservation?**

- Species are protected in its natural habitat
- and their reproduction is facilitated

2pts

(iii) **State three methods of in-situ conservation other than establishing national reserves.**

- Traditional home gardens
- Establishing sanctuaries
- Reintroduction of species into natural habitat/ environment

3pts

(iv) **What is Ramsar convention?**

(1) (Convention dealing with) conservation of wetlands of international importance (2) especially as waterfowl habitats.

2pt.

(v) **Name two Ramsar sites located in the north-West of Sri Lanka.**

- Anawilundawa (tank) sanctuary (reserve.)
- Vankalai sanctuary (reserve.)
- Willpattu national park (recently).

any 2 — 2pts

Total 40 x 2½ marks = 100 marks

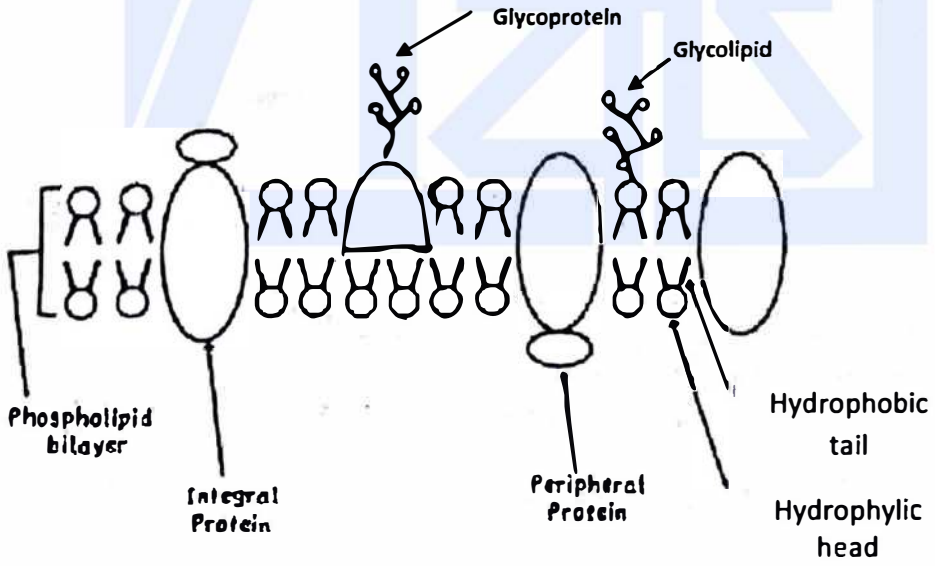
Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දේ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

PART B - Essay

5. (a) Describe the structure of plasma membrane

1. Fluid mosaic model of plasma membrane
2. consists of phospholipids and proteins.
3. Phospholipids form a fluid bilayer / two layers
4. with outer hydrophilic heads
5. and inner hydrophobic tails.
6. Some proteins are fully embedded
7. while some are partially embedded
8. in the fluid matrix and
9. they are called intergral proteins.
10. (Some) proteins are (loosely) bound to the membrane and
11. they are called peripheral proteins.
12. (Some) (short) sugar molecules/ (short) chains/ oligosaccharides/ polysaccharides
13. are attached to the surface of proteins
14. to form glycoproteins
15. and to phospholipids
16. to form glycolipids.

16 x 4 mraks = 64 marks



Diagram

Fully labeled correct diagram 7

Partially labeled correct diagram 3

Unlabeled diagram no marks

Diagram = 07 marks

Sub total for (a) = 71 marks

A/L උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(b) **Explain how a nerve impulse is generated in the plasma membrane of an axon and how it is conducted along a non-myelinated axon**

any one.

1. At resting condition axolemma / plasma membrane of axon is polarized.
2. Outside of axolemma ~~is positively (+vely) charged.~~
3. Inside of axolemma is negatively (-vely) charged.
4. Application of a threshold stimulus,
5. produces influx/flow of Na^+ from extra cellular fluid to intracellular fluid /outside to inside of the axon. efflux.
6. This is followed by ~~efflux~~/flow of K^+ from intracellular fluid to extra cellular fluid/ inside to outside of the axon. efflux
7. This causes an action potential at the site of stimulus / (plasma) membrane of axon depolarizes,
8. causing reversal of polarity.
9. Outside of membrane becomes –vely charged,
10. and inside of the membrane becomes +vely charged.
11. Region of the membrane immediately ahead of this region is still at resting condition / outside is +vely charged and inside is –vely charged. (and the region ahead of that)
12. Difference in the (electric) potential now exists between the region of action potential and this. region.
13. Due to this difference in potential, eddy currents / local circuits will flow currents
14. from the region to the region of action potential immediately ahead of action potential (The region ahead of action poter -a
15. through extracellular fluid and
16. through the intracellular fluid. currents
17. These eddy currents / local circuits (eventually) pass through plasma membrane.
18. and the action potential will move forward (as an impulse).
19. Action potential will not be formed in the reverse direction (although eddy currents/ local circuits / flow), currents.
20. because immediately after one action potential 2nd action potential cannot be formed / there is a refractory period.

Sub total for (b): 20 x 4 = 80

Total 71 +80 = 151

Maximum = 150

Alevel උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(06) (a) **Describe advantages and disadvantages of sexual and asexual reproduction in plants**

Advantages of sexual reproduction in plants:

1. Meiosis takes place when ~~gametes~~ Spores are formed,
2. where random segregation / Independent assortment of chromosomes
3. and exchange of genetic material between homologous chromosomes / crossing over takes place.
4. Therefore, reshuffling of genetic material occurs,
5. resulting in new combination of genes (alleles).
6. which leads to genetic variation /new traits.
7. Therefore, evolution is possible.
8. Offspring have unique combinations of genes (inherited from the two parents).
9. Produces seeds.
10. which facilitates the dispersal of offspring.
11. Seed dormancy allows germination to be suspended/delayed until environment is suitable.

Disadvantages of sexual reproduction in plants:

12. Two parents/ mates/ two types of gametes are needed.
13. Time consuming/ takes more time (to make offspring).
14. Expensive (in-terms of resources)
15. (May) need pollinators / pollinating mechanisms / external agents.

Advantages of asexual reproduction in plants:

16. Only one parent is required.
17. It gives more chance for reproduction / rapid multiplication in number.
18. Special mechanisms for pollination are not required.
19. Genetically identical offspring are produced.
20. Favorable characters are preserved.

Disadvantages of asexual reproduction in Plants:

21. Many propagules fail to grow/ (spores) fail to produce offspring
22. resulting in waste of resources/ Expensive.
23. No (genetic) variations and
24. Does not aid in evolution.

(b) Explain alternation of generation with respect to plants

1. Alternation of a haploid gametophyte generation and a diploid sporophyte generation (in the life cycle o plant).
2. Diploid sporophyte produces spores
3. by meiotic division,
4. which are haploid.
5. Spores germinate and
6. divide by mitosis,
7. producing gametophyte,
8. which produces gametes
9. which are haploid.
10. Two gametes fuse / fertilize
11. to form a zygote
12. which is diploid.
13. Zygote undergoes mitosis
14. to form the embryo,

උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

15. which develops in to sporophyte.
16. During evolution, sporophyte generation becomes dominant / gametophyte generation becomes recessive ~~reduced~~
reduced

24 + 16 = 40;
Any 38 X 4 marks = 152 marks
Maximum 150 marks

7. (a) **Discuss the importance of microorganisms in human health**

1. Some microorganisms are harmful / pathogenic.
2. Some are opportunistic pathogens and
3. cause infection if there is injury/tissue damage
4. or if the general resistance of the body is lowered.
5. Some are potential pathogens and
6. cause infectious diseases/ infections.
7. Some of them are virulent.
8. eg. Chicken pox virus.
9. Some produce toxins. eg- Bare produce enzymes that contribute to invasiveness/ that help invasion.
10. eg: *Vibrio cholerae / Corynebacterium diphtheriae / Clostridium tetani / Salmonella typhi.*
11. Pathogens are generally specialized/ adapted for a particular portal of entry (to cause disease).
12. They invade through gastrointestinal tract
13. eg. *Salmonella typhi / Vibrio cholerae / Shigella* sp. / Polio virus / *Escherichia coli*
14. or respiratory tract
15. eg. *Mycobacterium tuberculosis / Corynebacterium diphtheriae / Bordetella pertussis /* Myxovirus
16. or genitourinary tract
17. eg. *Treponema pallidum / Neisseria gonorrhoeae /* HIV/ *E. coli*
18. or wounds of skin
19. eg; *Clostridium tetani / Leptospira /* Rhabdovirus / HIV.
20. Some are beneficial (to human health)
21. eg: Lactic acid bacteria / Lactic acid produced by vaginal bacteria creates an unfavorable environment for many pathogens.
22. Some microorganisms are used in vaccine production
23. ~~eg: B.C.G. vaccine / Polio vaccine.~~
24. Some are used in antibiotic production
25. eg. *Penicillium / Streptomyces /* ~~Penicillin / Streptomycin / Tetracyclin.~~
26. Some of the intestinal microorganisms produce vitamins.

Alevel lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

b) Describe the economic importance of Fungi

1. Some (heterotrophic / saprotrophic) fungi cause food spoilage,
2. eg. *Mucor*
3. some (pathogenic) fungi cause diseases of plants
4. and reduce the economic benefits / cause economic losses.
5. Some fungi cause decay in furniture / wooden structures.
6. Some fungi are used as food. / food ~~additives~~, supplements.
7. eg. Mushrooms/ *Pleurotus*/ *Agaricus*/*Lentinus*. / yeast / saccharomyces cerevisiae
8. Some are used for production of alcoholic beverages/ alcohol/ bakery ~~industry~~/ bread
9. eg. *Saccharomyces cerevisiae*. / yeast.
10. Some are used to produce antibiotics.
11. eg. *Penicillium notatum*/ *Penicillium chrysogenum*.
12. Some are used to produce enzymes.
13. eg. *Aspergillus niger*/ *Saccharomyces cerevisiae*/ *Rhizopus* sp./ *Aspergillus oryzae*
14. Some are used to produce compost./ ~~Recycling of wastes.~~ or in composting.

or in composting.

26 + 14 = 40;

Any 38 x 4 =152

Maximum 150 marks

8. (a) Briefly describe the diversity of nutrition seen among protists.

1. Protists can be autotrophic or
2. heterotrophic.
3. In autotrophic nutrition, source of carbon is inorganic/ CO_2.
4. Some protists are photoautotrophic and
5. their energy source is light.
6. eg. Chlorophyta / Chlamydomonas chlamydomonas
7. Rhodophyta and / helidium
8. Phaeophyta / sargassum. Ba - chrysophyta / diatoms
9. In heterotrophic nutrition, source of carbon is organic.
10. Some heterotrophic protists are holozoic
11. They ingest (food),
12. digest,
13. absorb (nutrients),
14. assimilate and
15. eject (undigestable matter).
16. eg. Ciliophora / *Paramecium*
17. Rhizopoda / *Amoeba.*
18. Some protists are symbiotic and
19. get nutrients by living in association with another species / by two species living together.
20. Some (symbiotic protists) are parasitic
21. eg. *Plasmodium.*
22. Some are mutualistic.
23. eg. algae of lichens

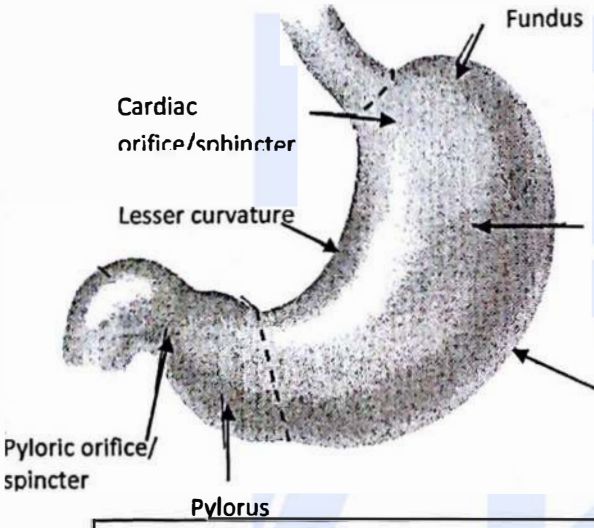
උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(b) Describe the gross structure of human stomach

1. J shaped
2. muscular sac / dilated sac (in the abdominal cavity).
3. Proximally continuous / Its proximal end connects with oesophagus
4. by cardiac orifice /sphincter and
5. continuous / connects with the duodenum from the distally / distal end.
6. ~~Pyloric~~ orifice.
7. which is controlled by pyloric sphincter.

Stomach is divided into

8. the fundus
9. the body and
10. the pylorus.
11. It has a lesser curvature and a greater curvature.
12. External surface is smooth.
13. Internal surface is folded / contain rugae.



Diagram

Fully labeled correct diagram: 7 marks

Partially labeled correct diagram: 3 marks

Unlabeled diagram: No marks

1 label = 1 marks.
# label = # 1 mark allocate.
max = 7
min = 0.

(23+13) 36 x 4 marks = 144 + 7 marks for the diagram = 151 marks

Maximum 150 marks

9. (a) Describe the Hardy-Weinberg equillbrium.

Hardy-Weinberg equilibrium states that

1. Allele /genotype frequencies of a (an ideal) population remain constant from generation to generation (in the absence of other evolutionary influences).

This occurs under several conditions / Several assumptions need to be fulfilled. They are:

2. Population size is (very) large / infinite;
3. random mating occurs;
4. no mutations take place;
5. no Immigration and no emigration / no migration(in to or out of population) /close population;
6. no (natural) selection.
7. Deviations of above assumptions / conditions / if those assumptions are not fulfilled, changes in allele / genotype frequencies / genetic drift occurs
8. leading to evolution.

(any of the)

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

(b) (i) Describe how blood groups are inherited to the children of a mother having blood group AB and a father having blood group A.

1. Genotype of the mother (having blood group AB) is I^AI^B.
2. Genotypes for father are either I^AI^A
3. or I^AI^0 / I^Ai
4. Gametes of the mother are I^A
5. and I^B
6. in 50% of each/ 1:1 ratio.
7. If father's genotype is I^AI^A, all the gametes are I^A.
8. The possible genotypes of the children are I^AI^A
9. and I^AI^B
10. in 1:1 ratio / 50% each.
11. Their phenotypes/ blood groups are A
12. and AB
13. in 1:1 ratio / 50% each.
14. If the father's genotype is I^AI^0 / I^Ai, gametes produced are I^A
15. and I^0/ i
16. in 50% each / 1:1 ratio.
17. The genotypes of the children are I^AI^A,
18. I^AI^B,
19. I^AI^0/ I^Ai,
20. I^BI^0/ I^Bi
21. in 1:1:1:1 ratio / 25% each.
22. Phenotypes / blood groups of children are A, AB and B
23. In 2:1:1 ratio.

- If points are shown in a diagram, marks should be given. However, correct words should be used.

(II) Explain how the inheritance of ABO blood groups differs from Medellan inheritance.

1. In Medelian inheritance, a character is controlled/ inheritted by two alleles of a gene.
2. ABO blood groups are controlled/ inherited by three alleles. / multiple alleles / poly allelism.
3. They are denoted as I^A, I^B and I^0/i. / multiple alleles / poly allelism.
4. In Mendelian inheritance, one allele is dominant over the other (recessive).
5. and in phenotype, dominant character is expressed. in the heterozygotes.
6. In ABO blood groups, I^A and I^B are codominant,
7. and both A and B characters are expressed in the phenotype, (when both I^A and I^B alleles are present).

8+ 23 + 7 =38
38 x 4 marks= 152
Maximum 150 marks

උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...

10. Write short notes on the following.

(a) Lymphatic system of man

1. Lymphatic system consists of lacteals,
2. lymph capillaries, 2a – lymph vessels
3. lymph nodes,
4. diffused lymph tissue,
5. lymphatic organs / spleen / thymus
6. and bone marrow.
7. It transports lymph.
8. Lymph capillaries originate blindly / have a blind end
9. and (they join to) form large lymph vessels
10. which join together to form ~~two large ducts~~, right lymphatic duct and.
11. ~~called right lymphatic duct and~~
12. thoracic duct.
13. Lymph flows due to contraction of nearby muscles and (3a) when lymph vessels are squeezed.
14. pulsation of large arteries. 3a →
15. Lymphatic system involves in / perform specific and non-specific immune responses/ immunity,
16. and helps in absorption of fat / fat soluble material (any example such as Vitamin A, D, E, K is accepted).

17 Points

(b) Sliding filament theory of muscle contraction

~~1. This theory explains the mechanism of muscle contraction.~~
~~2. (According to this theory) thin actin filaments (of muscle fibers)~~ slide over thick myosin filaments (during muscle contraction).
3. Myosin filaments contain heads and
4. actin filaments contain binding sites/ regions.
5. When a nerve impulse reaches the skeletal muscle fibre (through neuro-muscular junction),
6. sarcoplasmic reticulum releases Ca^{2+}.
7. Ca^{2+} expose binding sites/ regions of actin filaments and
8. myosin heads attach to binding sites/ regions
9. forming (actin-myosin) cross bridges.
10. ATP provides the energy for this/ ATP is needed for this.
11. (When activated) (actin-myosin) cross bridges tilt inwards / towards center of sarcomere
12. in a short powerful stroke.
13. A series of powerful strokes causes the contraction of muscle fibre/ sarcomere
14. (Due to this), the actin filaments slide towards the centre of sarcomere,
15. shortening the I band and
16. H zones while
17. A band remains at the same length.

(c) Ozone layer depletion

1. Depletion of ozone layer occurs due to release of chlorofluorocarbons/ CFCs
2. from refrigerators/ air conditioners/ aerosol cans.
3. This increases the harmful ultra-violet radiation/ rays (coming from the sun)
4. This increases (risk of) cataracts of eyes,
5. skin cancers and
6. lowers crop yield by
7. interfering with photosynthesis.

16+17+07 = 40
Any 38 X 4 marks = 152 marks
Maximum 150 marks

Alevel Lapi උසස් පෙළ විද්‍යා/ගණිත/කලා/වාණිජ හා තාක්ෂණ විෂය ධාරාවන්ට අදාළ සියලුම ප්‍රශ්න පත්‍ර/සටහන් හා තවත් බොහෝ දෑ ලබා ගැනීමට පිවිසෙන්න www.alevelapi.com වෙත ...