மொறட்டுவைப் பல்கலைக்கழக பொறியியற் பீட தமிழ் மாணவர்கள் நடாத்தும் க.பொ.த உயர்தர மாணவர்களுக்கான 7வது முன்னோடிப் பரீட்சை-2016

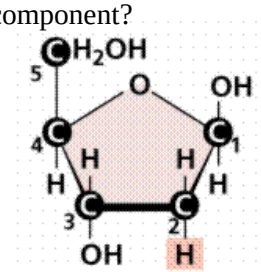
கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர) முன்னோடிப் பரீட்சை - 2016
General Certificate of Education (Adv.Level) Pilot Examination - 2016

உயிரியல் I Biology I	09	E	I	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 those carefully.
- In each of the questions **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. A chemical structure of an organic molecule is illustrated in the following diagram. Which of the following substance consists of this molecule as one of its major structural component?



(1) ATP
(2) Inulin
(3) Cellulose
(4) RNA
(5) DNA

2. Which of the following is not directly involved in the formation of tertiary structure of protein?
(1) Peptide bond
(2) Disulphide bond
(3) Hydrogen bond
(4) Ionic bond
(5) Hydrophobic interactions

3. Which one of the following structure and function relationship is paired incorrectly?
(1) Tight junction – Join the cytoskeleton of the adjacent cells together
(2) Mesosome – Take part in the cellular respiration
(3) Peroxysome – Participate in the photorespiration
(4) Rough ER – Synthesis of membranous glycolipids
(5) vacuole – Giving rigidity and strength to the cell

4. Which one of the following pair regarding some metabolic processes and their products of the metabolic processes is incorrectly matched?

Metabolic process	Products
(1) Light reaction	NADPH, ATP, O_2
(2) Kreb's cycle	NADH, $FADH_2$, CO_2, ATP
(3) Glycolysics	NADH, ATP
(4) Electron transportation chain	ATP, O_2
(5) Oxidation of pyruvate	NADH, CO_2

5. At which stage of meiosis does the independent segregation of chromosome take place?
   (1) Prophase 1 (2) Anaphase 1 (3) Prophase 2 (4) Metaphase 1 (5) Anaphase 2

6. Which one of the following is incorrect regarding the Calvin cycle of photosynthesis?
   (1) CO_2 is accepted by a 5C compound RuBP
   (2) ATP is used in carboxylation process
   (3) It occurs in bundle sheath cells of C4 plants
   (4) Entire NADPH produced from the light reaction is used to convert PGA into PGAL
   (5) Photo respiration affects the process of Calvin cycle

7. This question is based on the following specific characteristics
   a) No larval stages
   b) Oviparity
   c) Kidney is the excretory organ
   d) Teeth present inside the mouth
   e) Major nitrogenous waste is urea

   Which classes consist of the above characteristics?

   (1) Reptelia, Mammalia (2) Aves, Reptelia (3) Mammalia, Chondrichthyes
   (4) Osteichthyes, Mammalia (5) Amphibia, Mammalia

8. Which of the following statement is correct about Kingdom Protista
   (1) All their members possess locomotary structures.
   (2) All photosynthetic members of them have chloroplast.
   (3) All the unicellular members of them are heterotrophs.
   (4) All the photosynthetic members of them have chlorophyll a.
   (5) The members, who possess Floridian starch as storage food, consist of silica in their cell wall.

9. Some special features of certain animals are listed below
   a) You can observe animal X in terrestrial environment, Y in marine environment and Z in fresh water environment
   b) Only the animal X has eyes
   c) animals X and Z have exoskeleton and Y has endoskeleton
   d) Only X and Z can locomote

   The illustrated animals X, Y and Z respectively,

	X	Y	Z
(1)	Crab	Scalily	Mussels
(2)	Frog	Seaanemone	Chiton
(3)	Prawn	Star fish	Crab
(4)	Leech	Oyster	Snail
(5)	Crab	Sea cucumber	Hydra

10. A. Spines B. Statolith C. Suckers D. Papillae
    E. Ommatedia F. Siphon G. Tentacles H. Antenn
    Which of the above characters are found in phylum Arthropoda?
    (1) A, B, C, H (2) A, B, E, H (3) B, C, E, G, H
    (4) A, C, D, E, H (5) A, B, D, E, G, H

11. Which one of the following is not a function of human liver
    (1) Regulation of body temperature
    (2) Maintaining the glucose level in blood
    (3) Storage of bile
    (4) Inactivation of sex hormones
    (5) Destroys micro organisms by phagocytosis

12. Which of the following usually consists of higher oxygen concentration in human?
    (1) In the inhaled air
    (2) In the red blood cells near lungs
    (3) In the blood in pulmonary artery
    (4) Air in the alveoli
    (5) In the blood in pulmonary vein

13. Solute potential of a plant cell is -1.2MPa and the pressure potential of that cell is +0.2MPa. This cell is immersed in the pure water and allowed for equilibrium. Which of the following is not possible after the equilibrium of the cell?
    (1) The water potential becomes as zero
    (2) Solute potential becomes as -0.2MPa
    (3) Cell is at the maximum turgidity
    (4) There is a negligible change in the solute potential
    (5) The rate of movement of water into and out of the cell are equal.

14. Which one of the following is incorrect regarding human lymphatic system?
    (1) Originates from the capillaries in the tissues and ends up in the subclavian vein
    (2) found in villi as lacteals
    (3) destroys dead red blood cells in lymphatic nodes by phagocytosis
    (4) regulates the volume of interstitial fluid
    (5) may be responsible for spreading of cancer cells

15. Where is neuro transmitter receptors are found in?
    (1) Node of Ranvier
    (2) Pre synaptic membrane
    (3) Myelin sheath
    (4) Post synaptic membrane
    (5) Ending of dendrites

16. Which of the following is incorrect regarding the thalamus of human brain?
    (1) It is a part of the embryonic forebrain
    (2) It is made up of neurones and nerve fibres
    (3) It is found in the both sides of third ventricle
    (4) It integrates sensory information and relays them to the higher centres of the brain
    (5) It is attached with pituitary gland by a stalk

17. Which part of the human body has large number of different kinds of receptors?
    (1) Skin (2) Eye (3) Ear (4) Nose (5) Tongue

18. Which one of the following is the correct order regarding the path way of sound waves in the air to organ of corti of human ear?
    (1) Tympanic membrane, incus, malleus, stapes, oval window, endolymph, cochlear membrane, perilymph
    (2) Tympanic membrane, malleus, incus, stapes, round window, endolymph, cochlear membrane, perilymph
    (3) External auditory canal, tympanic membrane, malleus, incus, stapes, round window, perilymph, cochlear canal, endolymph
    (4) Pinna, temporal bone, tympanic membrane, ear ossicles, round window, perilymph, endolymph
    (5) Tympanic membrane, malleus, incus, stapes, oval window, perilymph, cochlear membrane, endolymph

19. During the formation of urine of a healthy human,
    (1) $NH4^+$ secretion takes place in distal convoluted tubule
    (2) The filtrate which reaches the descending loop of Henley may contain glucose
    (3) Na^+ and water are reabsorbed in ascending loop of Henley
    (4) None of the waste materials are selectively reabsorbed
    (5) All unnecessary components are filtered out from blood during the ultra filtration

20. In which of the following region of a sarcomere both actin and myosin fibres can be found?
    (1) H zone (2) I band (3) A band (4) M line (5) Z line

21. Which one of the following does not determine the resonance of the voice in human?
    (1) Frontal bone (2) Parietal bone (3) Sphenoid bone
    (4) Maxillary bone (5)Ethmoid bone

22. Number of bones involved in the formation of thoracic cage of a human body?
    (1) 24 (2) 25 (3) 36 (4) 37 (5) 39

23. Which one of the following is incorrectly paired about plant growth substances?
    (1) Ethylene can be translocated through the phloem tissue
    (2) Auxin inhibits the apical dominance
    (3) Cytokinin delays the scenescence of leaves
    (4) Absicic acid induces closure of stomata
    (5) Giberellin is produced in germinating seeds

24. All seed producing plants
    (1) Do not producing flowers
    (2) Do not producing vascular tissues
    (3) Do not producing heterospores
    (4) Do not producing motile male gamates
    (5) Do not producing gametophytes

25. Which one of the following is most likely happen when the concentration of progestrone is high in the blood of human female
    (1) Occurance of menstrual phase
    (2) Development of graffian follicle
    (3) Development of corpus luterus
    (4) Occurance of secretary phase in uterus

(5) Occurance of proliferative phase in uterus

26. Which of the following phylum consists of unisexual animals and external fertilization in all of their members?
    (1) Coelenterata (2) Platyhelminthes (3) Annelida
    (4) Nematoda (5) Echinodermata

27. Which of the following terms correctly indicates the group of genetically identical individuals produced from the vegetative reproduction?
    (1) Population (2) Family (3) Genus (4) Clone (5) Parthenogenesis

28. Which one of the following correctly indicates the blood group of the father if a mother with AB blood group has a child with A blood group
    (1) AB only (2) A, O only (3) AB, O only (4) AB, A, O only (5) A, AB, B and O

29. Which one of the following process is incorrectly paired with the enzyme related to the process.
    (1) Replication of DNA - primase
    (2) Multiplication of HIV in the host cell – Reverse transcriptase
    (3) Transcription – DNA polymerase
    (4) Unwinding of DNA double helix – DNA helicase
    (5) Cut DNA at specific sites - Restriction endonuclease

30. The anticodon of tRNA that carries the amino acid of AAG codon
    (1) AAG (2) UUG (3) TTC (4) CCT (5) TTU

31. There are three genes named A, B and C linked in a chromosome where A and B are in 20 mapping units a part and the distance between B and C are negligible. Which one of the following will be the percentage of heterozygous for all traits of next progeny in a genetic cross of AaBbCc * aabbcc ?

    (1) 10 % (2) 20 % (3) 30 % (4) 40 % (5) 50 %

32. Which one of the following is incorrect regarding “microsatellites”?
    (1) These are located on a particular gene
    (2) These are small sequence of nucleotides in tandem repeats of a DNA molecule
    (3) These are found between the genes where that region is not coded in protein synthesis
    (4) It is possible to indetify a person by the number of tandem repating unts
    (5) They can be transmitted to generations without any changes from their parents

33. Which one of the following is not conserved under Ramsar convention in Sri Lanka ?
    (1) Bundala national park
    (2) Kumana wet land
    (3) Muthurajawela sanctuary
    (4) Annaiwilundawa tank sanctuary
    (5) Vankalai sanctuary

34. Which of the following statement is incorrect regarding chlorinated hydro carbon pesticides?
    (1) It gets accumulated through the food chain
    (2) It affects the Ca metabolism of birds and thins egg shell
    (3) It easily loses its toxicity
    (4) It develops resistance in pests
    (5) It gets accumulated in body since it can dissolve in fat

35. Which of the following is the major reason for the loss of biodiversity/
    (1) Losing of habitats
    (2) Increase in human population
    (3) Introdution of exotic species
    (4) Hunting
    (5) Environmental pollution

36. Total primary productivity of the grass land ecosystem is $34000 kJm^{-2}yr^{-1}$. If the energy available for 4^{th} trophic level is $06 kJm^{-2}yr^{-1}$, which of the following would be the energy in used in the respiration of primary producers in $kJm^{-2}yr^{-1}$?
    (1) 600
    (2) 3400
    (3) 6000
    (4) 28000
    (5) 334000

37. Which one of the following statements is correct regarding prions/
    (1) They cause diseases in plants
    (2) They synthesis their own proteins with the help of genes of mammals
    (3) They can be observed under light microscope
    (4) They can be subjected to mutation
    (5) They cause meningitis in human

38. Which of the following industrial manufacturing processes does not use metabolic end products of microorganisms?
    (1) Yoghurt
    (2) Vinegar
    (3) Alcoholic beverages
    (4) Penicillin
    (5) Food suppliments

39. Which one of the following antibiotics prevent the growth of fungi by inhibiting the synthesis of cell membrane?
    (1) Polymyxin
    (2) Ciprofloxacin
    (3) Clotrimazole
    (4) Erythromycin
    (5) Penicillin

40. Which one of the following pathogen is not transmitted to human through drinking water
    (1) Staphylococcus aureus
    (2) Salmonella typhi
    (3) Vibrio cholera
    (4) Shigella flexneri
    (5) Entero virus

- **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 combinations 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 combinations of responses is correct

41. Which of the followings does/do never undergo hydrolysis?
    (A) Galactose
    (B) Fatty acid
    (C) ATP
    (D) Nucleotide
    (E) Cellulose

42. A medical examination report of an adult man is given below. Which readings deviate/s from the standard range due to his illness?
    (A) White blood count – 8000 cells /mm^3
    (B) ESR (erythrocyte sedimentation rate) – 8mm/1^{st} hour
    (C) Amount of haemoglobin / Hb count – 6g/100ml blood
    (D) Fasting blood glucose – 180mg/100ml blood
    (E) Systolic blood pressure – 110mm Hg

43. Which pair/s is/are incorrect regarding vitamins and their deficiency symptoms?

Vitamins	Deficiency symptoms
(A) Retinol	Xerophthalmia
(B) Folic acid	Annemia
(C) Calciferol	Oesteophorosis
(D) Ascorbic acid	Cracking of skin around mouth
(E) Pantothenic acid	Exhaustion

44. Which of the following statements/s is/are correct regarding cardiac muscle fibres?
    (A) They are connected together by intercalated disc
    (B) They don't have A band
    (C) They are cylindrical in shape
    (D) They are intervened by autonomous nerves
    (E) A nerve impulse is essential to initiate their contraction

45. Which of the following statements is/are incorrect regarding collenchyma?
    (A) They can be formed by the activity of lateral meristem
    (B) They can be found in all flowering plants
    (C) They are highly thickened at the corners of their cell wall
    (D) They are non living
    (E) They can only be found in the peripheral regions of the plant body

46. Which of the following/s may reduce the oxygen carrying capacity in blood?
    (A) Hydrocarbon
    (B) Sulphurdioxide
    (C) Nitrogenoxide
    (D) Carbondioxide
    (E) Particulatematter

47. Which of the following/s might has/have occurred during palaeozoic era?
    (A) Origin of latimeria with lobular funs
    (B) Colonization of terrestrial plants
    (C) Origin of unicellular protists
    (D) Origin of amphibians
    (E) Origin of birds

48. Which of the followings hormones act antagonistically to each other when maintaining homeostasis in human?
    (A) Calcitonin – Parathhormone
    (B) Insulin – Glucagon
    (C) Progesterone – Oxytocin
    (D) Adrenalin – Nor adrenalin
    (E) Prolactin inhibiting hormone – Prolactin releasing hormone

49. Which of the followings has/have two pair of tentacles?
    (A) Anthozoa
    (B) Holothuroidea
    (C) Gastropoda
    (D) Crustacia
    (E) Cephalopoda

50. Which of the following/s pair/s is/are incorrectly matched?
    (A) Extinct species – *Alphonsea hortensis*
    (B) Endangered species – *Elephas maximus*
    (C) Cultural species – Blue magpie
    (D) Endemic species – *Hevea brasiliensis*
    (E) Relict species – *Ichthyophis glutinosus*

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மொறட்டுவை பல்கலைக்கழக பொறியியற் பீட தமிழ் மாணவர்கள்
நடாத்தும் க.பொ.த உயர்தர மாணவர்களுக்கான 7வது
முன்னோடிப் பரீட்சை - 2016

கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர) முன்னோடிப் பரீட்சை - 2016
General Certificate of Education (Adv.Level) Pilot Examination - 2016

உயிரியல் II Biology II	09	E	II	மூன்று மணித்தியாலம் Three hours

INDEX NO .....

Instructions :

* This question paper consists of 10 questions in 17 pages.
* This question paper comprises part A and Part B. The time allotted for both parts is three hours.

PART A - Structured Essay (Pages 02-16)

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

PART B - Essay (Pages 17)

* Answer all four questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, tie the two parts together so that part A is on the top of part B before handing over to the supervisor.
* You are permitted to remove only part B of the question paper from examination hall.

For Examiner`s Use Only

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

Final Marks

In Numbers	
In Words	

Code Numbers

Examiner	
Checked by	1.
	2.
Supervised by	

[see page two

Part – A Structure

Answer all **four** questions on this paper **itself**

Don't write anything here

1. (A) (I) (a) Name the ***three*** components of an ATP molecule?

……

(b) Give the ***three*** processes which are involved in the formation of ATP during the metabolism of living organisms.

……

……

……

(II) (a) Name the ***two*** major substances that are structural components of a eukaryotic chromosome.

……

(b) In which phase of a cell cycle does the replication of DNA occur?

……

(III) State the features of DNA, that are necessary to function as hereditary material of organisms.

……..

……...……...

……...……

……

(IV) Some characteristics of phylum Mollusca are given in column 1 of the following table. Indicate in the relevant cage of the following table whether the characteristics listed in column 1 are present (+) or absent (-) in the animals given in row 1

Characteristic	Chiton	Snail	Oyster	Squid
eyespot				
siphon				
suckers				
exoskeleton				

(B) (I) (a) What is meant by essential elements in plants?

……

(b) State the principal form of absorption of the following elements.

1) Phosphorus ……...

2) Molybdenum ……

(II) State the major steps in holozoic nutrition.

……

……

[*see page three*

Don't write anything here

(III) (a) Write the ***four*** layers of the basic histological plan of the wall of human alimentary canal in the correct order?

……..

(b) Name the parts of the alimentary canal which shows the following features.

1) Taenia coli …….

2) Oblique muscles …….

(IV) State the structural features of intestine for efficient absorption of digested food.

……

……

……

……

(V) (a) What is phloem loading?

……

……

(b) State ***two*** features of sucrose that make it appropriate as the major transportation material in phloem.

……

……

(C) (I) (a) What is reflex?

……

……

……

(b) Name the neurons that form the functional unit of the vertebrate nervous system.

……

……

……

(II) Indicate whether parasympathetic nervous system is involved in each of the following statements using (✓) or (✗) marks

1) Relaxation of the sphincter of bladder ( )

2) Constriction of pupil ( )

3) Increasing peristalsis of the gut ( )

(III) State ***three*** structural differences between bone and cartilage.

……

……

……

[*see page four*

Don't write anything here

(IV) (a) What are the functions of intervertebral discs?

……

……

(b) State the main features seen in the human vertebral column that contribute to its identification?

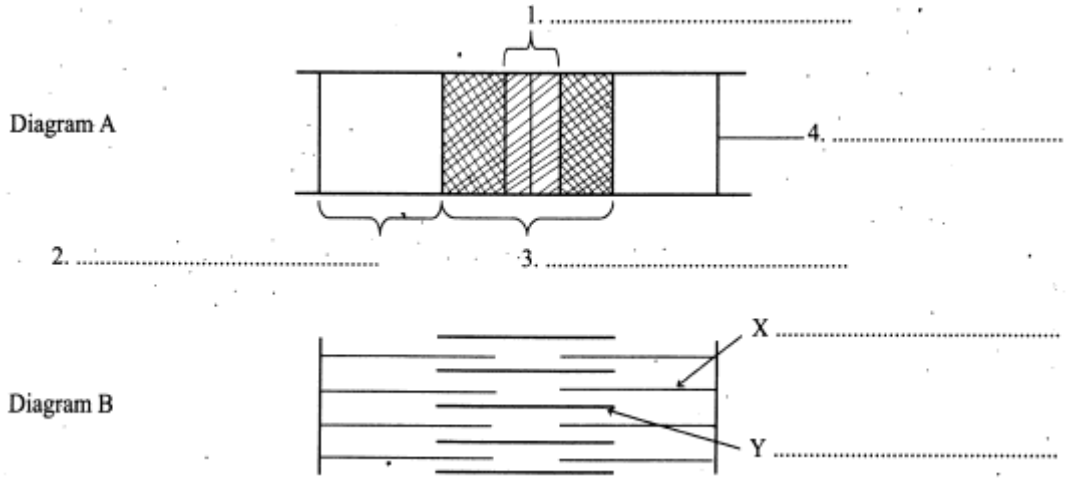
……

……

2. (A) (I) What is the location of sarcomeres inside the muscle fibres?

.....

(II) The diagrams below show the appearance of a single sarcomere from a striated muscle fibre during relaxation. Diagram A shows the details that would be visible under a light microscope and diagram B shows the details visible through an electron microscope.



(a) Name the regions labelled 1 - 4 on diagram A?

(b) Mark the main protein type that is found in X, Y on diagram B

(III) Which of the regions labelled in diagram A shortens in length during normal contraction of a striated muscle?

……

(IV) State the main role of the following substances in the contraction of skeletal muscle.

Myoglobin.....

Calcium ions..... .....

Creatine phosphates.....

(V) How does thigmonasty differ from thigmotropism?

.....

.....

[see page five

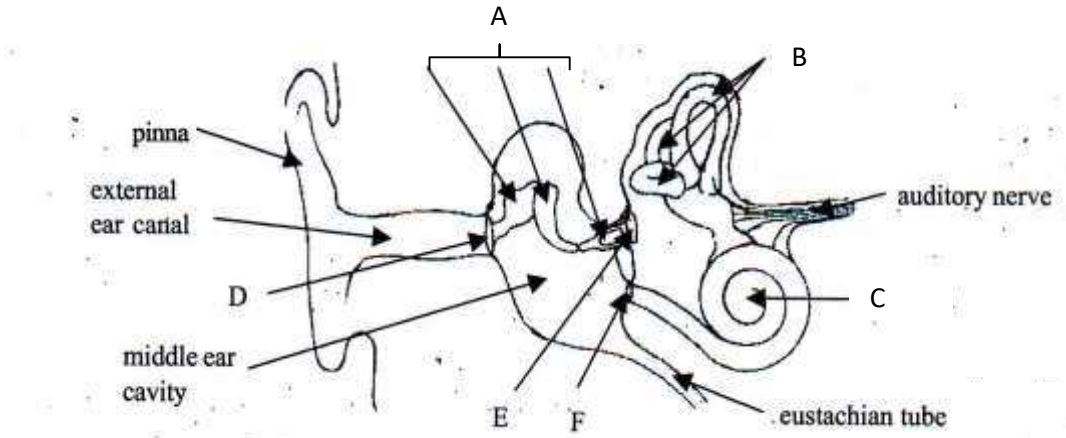
Don't write anything here

(B) (I) State ***two*** functional features of a receptor?

.....

.....

(II) The diagram below shows the structure of the human ear.



(a) Name the structures A to F.

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

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

E..... F.....

(b) Explain the main function of the Eustachian tube?

.....

.....

(iii) State the features that are found only in the mammalian ear?

.....

.....

(iv)Name the multicellular structure in the human ear that is directly involved in the transformation of mechanical energy into nerve impulses during hearing?

.....

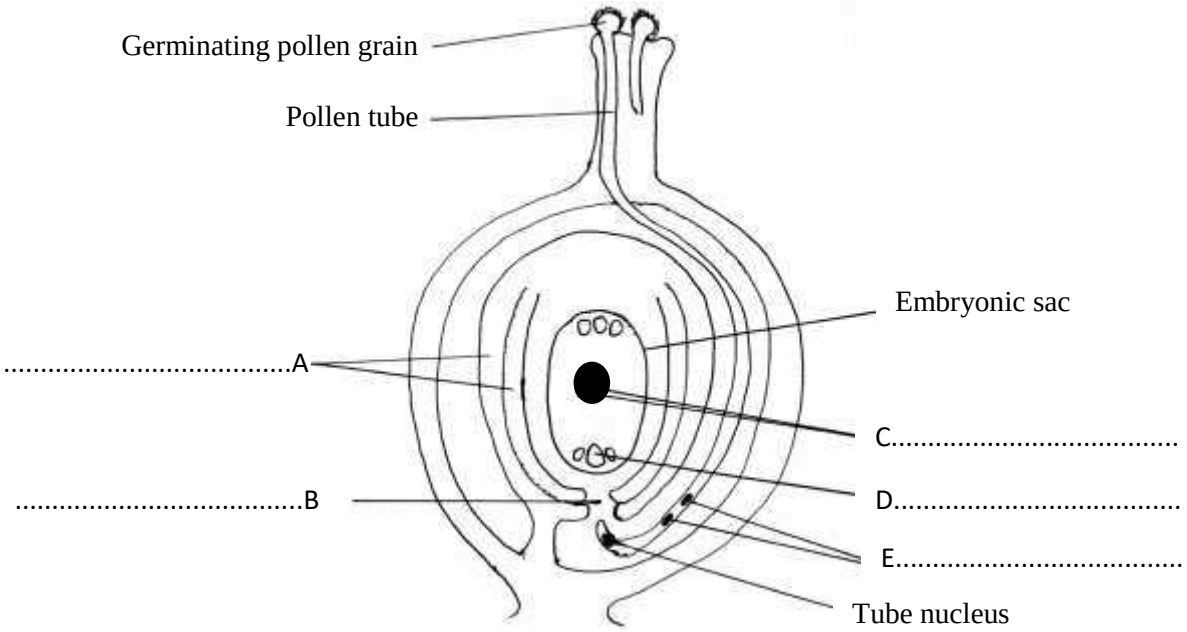
C. (i). Name the parts of the angiosperms that correspond to the parts of *Selaginella.*

Parts of angiosperms	**Parts of *Selaginella***
a. Stamen	.....
b. Carpel	.....
c. Flower	.....
d. embryo sac	.....

[*see page six*

Don't write anything here

(ii).The diagram below shows part of a flower just before fertilization. Name the parts A to E on the diagram.



iii. What is double fertilization?

.....

.....

iv. Name the parts of the ovary of a flower which develop into each of the following structures?

a.Seedcoat.....

b.Endosperm.....

c.Pericarp…….

v. Name the plant growth substance that is involved in each of the functions given below?

Causes apical dominance.....

Initiation of flowering …….

3.(A) (i) State the organizational levels of environment based on the increasing order of complexity.

……..

(ii) What is ecological niche?

…..……...

....……..

(iii)(a) State an aquatic ecosystem which is rich in biodiversity.

…….....

……..

(b) State the animal phylum which is involved in the formation of the above ecosystem.

……

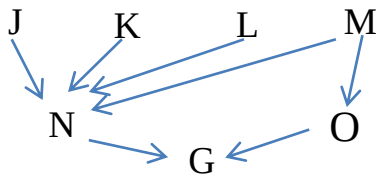
[*see page seven*

Don't write anything here

(c) State the human interferences in the above ecosystem.

……

(iv) A food web of a naturally balanced ecosystem is indicated in the diagram given below.
(The animals are indicated by the English capital letters.)



(a) How does the biomass change in successive trophic levels in this ecosystem?

……

……

……

(b) Briefly explain the consequences when the predator G is removed from this ecosystem.

……

……

……

……

(B)(i)(a) What is Biome?

……

……

……

……

(b) Name the appropriate biomes for the following statements.

Higher primary productivity.

……

Receives light only for few months of an year

……

Evergreen plants with needle like leaves.

……

(ii)(a) What is the basic concept of bio chemical evolution?

……

……

[see page eight

Don't write anything here

(b) Name the biologist who proposed the above theory.

……..

……..

(iii) State how many years ago, the following events might have happened?

Extinction of Ammonites …….

Origin of modern humans ……

Colonization of animals on land …….....

(iv) a) What is meant by sustainable use?

……..

……..……

b) Name the convention which was formed for the sustainable use of bio resources.

……..

(C) (i) What do you mean by red data book?

……..

……..

(ii)(a) State under which categories the following organisms [a-d] are included in the ICUN RED LIST.

Elephas maximus ……..

Melanochellius trijuga ……..

Alphonsia hortensis ……..

Caretta caretta ……..

(b) State the next ***four*** groups of organisms of ICUN list in the decreasing order of threat level.

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…...……

(iii) Give ***three*** organisms for which a permits needs to be obtained to be exported from Sri Lanka based on CITES convention.

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(iv)State the air pollutants which causes the following adverse impacts.

Asthma ……

Photochemical smog ……

[see page nine

Don't write anything here

4.(A) (I) Name the following cellular organizations of bacterial cells.

(a) Rod shaped bacterial cells in chain like arrangement.

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(b) Spherical shape bacterial cells in a cube like arrangement.

……

(c)State the main steps involved in simple staining procedure to analyze bacteria under the microscopes?

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(ii)(a) What is food poisoning?

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(b) Name ***two*** bacterial species which cause food poisoning and state the type of exotoxin produced by them.

Bacterial species	Type of exotoxins
……..	……...
……...	……..

(iii) State the major concepts involved in food preservation.

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(B) (i) (a)What is the reason for carrying out Coliform test?

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(b) State ***four*** common features of coliform bacteria.

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(ii) (a) What are the environmental problems that arise due to the dumping of solid waste in the open space?

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(b) What are the benefits of natural decomposition?

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[*see page ten*

Don't write anything here

(iii) What are the beneficial effects of Rhizophere bacteria to the plants?

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(C)(i) (a) What is recombinant DNA technology?

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(b) What are the features of DNA that make it the most appropriate molecule to be processed in recombinant DNA technology?

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(ii)Name the bacterial species which are used to develop the following genetically modified crops?

Production of golden rice ……

Resistant to weedicides ……

Resistant to pest ……

(iii)(a) State the conditions that have to be fulfilled in order to maintain Hardy-Weinberg equilibrium

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b) A dominant allele determines the ability to taste the chemical phenyl thio carbamide (PTC) in human. In a particular human population, 195 individuals were able to taste PTC and 105 were unable taste it. Assuming that the Hardy-Weinberg principle applies to this case, calculate the percentage of individuals with heterozygous genotype.

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[*see page eleven*

கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர) முன்னோடிப் பரீட்சை - 2016

General Certificate of Education (Adv.Level) Pilot Examination - 2016

உயிரியல் Biology	II II	09	E	II

Part B – Essay

✵*Answer **four** questions only.*
Give clearly labelled diagrams where necessary.
*(Each question carries **15** marks.)*

01. a) Describe the location and the gross structure of the human kidney.
    b) Explain the role of kidney in maintaining homeostasis.

02. a)Describe the primary structure of a dicotyledonous root seen in cross section and explain the functions of various tissues in it.
    b) Briefly explain how lateral meristem arises in dicot stems and roots and give a description of common activities of the meristem.

03. Write a descriptive account on the mutation in living organisms and the need of mutation for the existence of a species.

04. a) State the global environmental problems and explain the causes and effects of them.

    b) Briefly explain the remedial measures to prevent these problems

05. a) Briefly describe the advantages of using microbial processes in industries over the chemical processes.

    b) Briefly explain five industries where microbial processes are used?

06. Write short notes on the followings
    a) Self-replication of DNA
    b) Functions of human liver
    c) Hormonal regulation in the human male reproductive system.

✵✵✵