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மொறட்டுவை பல்கலைக்கழக பொறியியற்பீட தமிழ் மாணவர்கள் நடாத்தும்
கல்விப் பொதுத் தராதர உயர்தர (கணித, விஞ்ஞான) மாணவர்களுக்கான 6 ஆவது
முன்னோடிப் பரீட்சை - 2015

கல்விப் பொதுத் தராதரப் பத்திர(உயர் தர) முன்னோடிப் பரீட்சை - 2015 General Certificate of Education (Adv. Level) Pilot Examination - 2015

Biology II
உயிரியல் II

09 E I

Three hours
மூன்று மணித்தியாலங்கள்

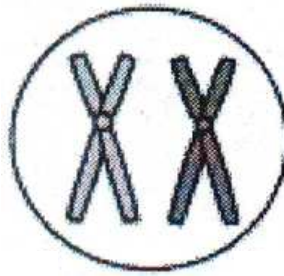
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Part I

- * This paper consists of **08** pages and **50** questions
- * Answer all the questions
- * Use of calculators is not allowed
- * Write your Index number in the space provided in the answer sheet
- * In each of the questions **1-50**, 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

1. Which one of the following elements groups contain **only** the trace elements required by man?
1. Cr, Al, I, Co 2. Zn, Cu, Fe, Mn 3. Na, Cl, Fe, Ca 4. Na, Ca, Mo, Co 5. Mg, Cu, Cl, Zn
2. Which one of the following can be hydrolyzed in human body?
1. Deoxyribose 2. Galactose 3. Nucleotide 4. Fatty acids 5. Amino acid
3. The diagram below of a diploid cell in prophase



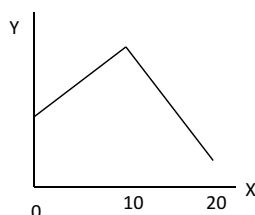
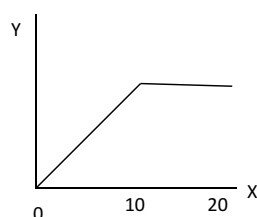
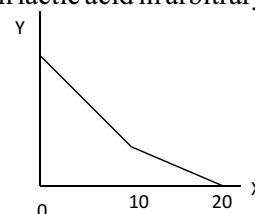
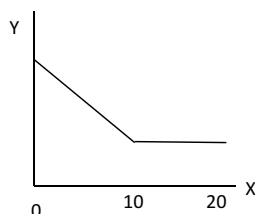
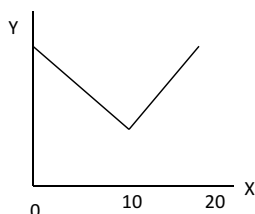
In G_1 after mitosis, which of the following would one daughter cell contain?

1. Two double chromatid chromosomes 2. one double chromatid chromosome
3. Two single chromatid chromosome 4. One single chromatid chromosome
5. Four single chromatid chromosomes
4. Which one of the following metabolic pathways most likely evolved first?
1. Cyclic photo phosphorylation 2. Kreb's cycle
3. Calvin cycle 4. C_4 photosynthesis
5. Glycolysis

5. Which one of the following feature is **not common** to C_3 and C_4 photosynthesis?

1. Photolysis
2. Atmospheric CO_2 fixation
3. Cyclic photophosphorylation
4. Non cyclic photophosphorylation .
5. Calvin cycle

6. Which of the following graphs show the change in lactic acid concentration in a muscle during and after a 10 minute period of vigorous activity?(X- Time in min. Y-concentration lactic acid in arbitrary units).



7. Which of the following statement regarding enzymes is **incorrect**?

1. Enzymes are absolutely necessary to the continued existence of a cell
2. Enzymes reduce the activation energy of a reaction
3. Enzymes are the reactants in a chemical reactions
4. Enzymes can be used over and over again
5. The active site of enzyme may be blocked by inhibitors.

8. Which of the following is **not** a function of bone?

1. Limits growth of an organism
2. Production of white blood corpuscles
3. Provides surface for muscle attachment
4. Storage and release of calcium Ions
5. Support to the body

9. Which of the following features is **unique** to the organism group indicated against it?

Feature	Organism group
1. Paired fins	Osteichthyes
2. Cilia	Ciliophora
3. Pedicellaria	Echinodermata
4. Exo skeleton	Arthropoda
5. Wings	Insecta

10. In a given phylum, which taxon contains the greatest number of species?

1. Class
2. Family
3. Genus
4. Order
5. Subspecies

11. Which of the following characters is unique for Domain Achaea?

1. Cell wall component peptidoglycan
2. Several kinds of RNA polymerase enzymes
3. Not sensitive to antibiotics
4. Lipids in cell membrane are branched
5. Lives in many habitats

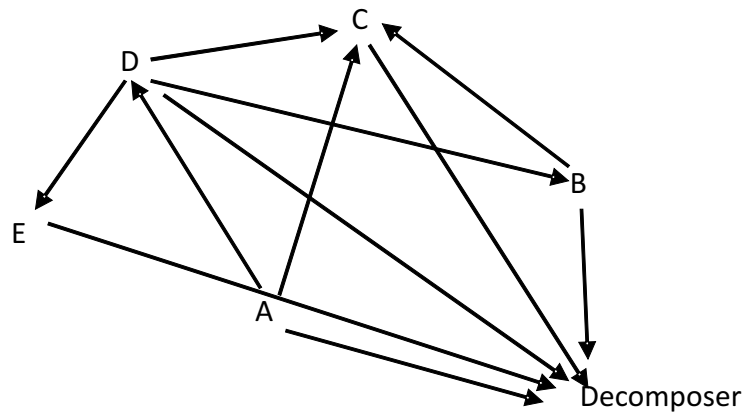
12. Which of the following animal classes **does not** include animals those posses tentacles?
 1. Cephalopoda 2. Gastropoda 3. Scyphozoa 4. Holothuroidea 5. Crustacea
13. Which of the following vitamin function relationship is **incorrect**?
- | Vitamin | Function |
|------------------|--------------------------------------|
| 1. Retinol | Maintain healthy condition of cornea |
| 2. Calciferol | Formation of collagen fibres |
| 3. Phylloquinone | synthesis of prothrombin |
| 4. Riboflavin | Synthesis of FAD |
| 5. Folic acid | synthesis of haemoglobin |
14. Which of the following enzymes catalyze the reactions that produce amino acids as one of the end product?
 1. Pepsin 2. Trypsin 3. Chymotrypsin
 4. Rennin 5. Enterokinase
15. In which one of the following blood vessels of a person would you expect to find the highest systolic blood pressure?
 1. Iliac artery 2. Pulmonary vein
 3. Afferent arteriole in the kidney 4. Capillary in the brain 5. Superior vena cava
16. Which of the following is **incorrect** regarding phloem transport?
 1. Sieve tube elements supply energy for phloem loading
 2. Water in the xylem vessels helps the transportation in phloem
 3. Modified companion cells which have much increased membrane surface areas are act as transfer cells
 4. Secretion of sucrose and other compounds into serve tubes against concentration gradient is called phloem loading
 5. Mass flow takes place from source to sink under a pressure potential gradient
17. In the human being which one of the following ordinarily found in a high concentration in the blood of the hepatic vein than in other blood vessels?
 1. Bile 2. Red blood corpuscles 3. urea
 4. oxygen 5. glucose
18. Which of the following is **incorrect** regarding stomata?
 1. Guard cells are sensitive to the concentration of CO₂ in the intercellular space of leaf
 2. Transport of ions across cell membrane is mainly responsible for stomatal movement mechanism
 3. Guard cells of some monocots are not kidney shaped
 4. In some plant species stomata open at night
 5. Guard cells are specialized cells to carry out transpiration efficiently
19. A part of the brain used in the transfer of information from one cerebral hemisphere to the other is the?
 1. Medulla oblongata 2. Corpus callosum 3. Cerebellum
 4. Hypothalamus 5. Thalamus
20. Which one of the following functions regarding autonomic nervous system is **incorrect**?
 1. Causing an endocrine gland to secrete hormones
 2. Contracting certain blood vessels and dilating others
 3. Causing changes in the heart rate
 4. Causing the muscles of the intestinal wall to contract
 5. Causing the muscles of the arm to contract suddenly in response to a pinprick

21. Which one of the following statements regarding human receptors is **incorrect**?
1. Touch receptors contain free nerve endings near the skin surface
 2. Dermis, joints, mesentery, tendon, muscles have pressure receptors
 3. Ruffini's body sensitive for cold and warm
 4. Taste buds receptor cells contain microvillies
 5. Touch receptors sensitive for least pressure and also most of them act as vibration receptors
22. Which of the following is **least** likely being result in a release of adrenaline (epinephrine) from adrenal glands?
1. Competing in an athletic event
 2. Going to school late
 3. Participating in a very interesting lecture
 4. Swimming in a very cold pool
 5. Sitting for an examination while unprepared
23. A. Patient has symptoms of gigantism. After a series of tests, it is concluded that the patient most likely to have a tumor. Which of the following structure could be affected?
1. Pituitary gland
 2. Adrenal gland
 3. Thyroid gland
 4. Hypothalamus
 5. Parathyroid gland
24. Large molecules such as uric acid and penicillin require ATP energy to be excreted with urine. these substances enter the nephron by the process of,
1. Ultra filtration
 2. Diffusion
 3. Osmosis
 4. Selective re absorption
 5. Tubular secretion
25. Which animal would produce a nitrogenous waste product with the lowest solubility in water?
1. Butterfly
 2. Shark
 3. Frog
 4. Polar bear
 5. Tilapia
26. Prominent features of some human bones are listed (A-D) below.
- | | |
|---------------------------------|--------------------|
| A. Foramen for vertebral artery | B. Mastoid process |
| C. Corocoid process | D. Trochleor notch |
- Which of the following is correct order of bones with above characters?
1. Thoracic vertebrae, frontal bone, hip bone, humerus
 2. Cervical vertebrae, temporal bone, scapula, ulna
 3. Cervical vertebrae, temporal bone, hip bone, ulna
 4. Cervical vertebrae, temporal bone, scapula, radius
 5. Cervical vertebrae, parietal bone, scapula, ulna
27. The following (A E) are events that takes place during the ovarian cycle of a woman
- A. Development of corpus luteum
 - B. Growth of the follicle and oogenesis
 - C. Ovulation
 - D. Secretion of progesterone
 - E. Sudden increase of LH in blood
- Which one of following is in the proper sequence?
1. B → E → C → A → D
 2. B → D → E → C → A
 3. E → B → C → A → D
 4. B → C → E → A → D
 5. E → B → C → D → A

28. Which one of the plant growth substances helps to overcome water stress in plants?
1. Auxin
 2. Gibberellin
 3. Cytokinin
 4. Absciscic acid
 5. Ethylene
29. Which of the following plants does not show natural vegetative reproduction?
1. *Zingiber officinale*
 2. *Mangifera indica*
 3. *Ipomea batatas*
 4. *Allium cepa*
 5. *Ananas sativas*
30. Which of the following is **not** a common character to both *Selaginella* and *Cycas*?
1. Motile male gametes
 2. Heterospory
 3. Depending on external water for fertilization
 4. True vascular tissue
 5. Dominant sporophyte
31. Which of the following is **not** true of a codon?
1. It consists of three nucleotides
 2. It may code for the same amino acid of another codon
 3. It never codes for more than one amino acid
 4. It may extend from one end of a tRNA molecule
 5. It is the basic unit of the genetic code
32. In humans red - green colour blindness is a sex linked recessive trait. If a couple produce a colour blind son which of the following **must** true?
1. The father is colour blind
 2. Both parents carry the allele for colour blindness
 3. Any one of the parents carries the allele for colour blindness
 4. The father carries the allele for colour blindness
 5. The mother carries the allele for colour blindness
33. In peas the trait for tall plants is dominant (T) and the trait for short plants is recessive (t), The trait for yellow seed colour is dominant (Y) and the trait for green seed colour is recessive (y), A cross between two plants results in 296 tall yellow plants and 104 tall green plants . Which of the following are most likely to be the genotypes of the plants?
1. TTyy x TTYy
 2. TtYy x TtYy
 3. TTYy x ttyy
 4. TtYy x TTYy
 5. TtYY x Ttyy
34. Crossing over frequencies of some genes in a chromosome is given below (The genes are named as A, B, C and C).
- | Genes | frequency of crossover |
|-----------|------------------------|
| B and ; D | 5% |
| C and A | 15% |
| A and B | 30% |
| C and ; B | 45% |
| C and ; D | 50% |
- Which of the following represents the correct relative positions of these four genes on the chromosome?
1. A,B,C,D
 2. A,D,C,B
 3. C,A,B,D
 4. C,B,A.D
 5. D,B,C,A
35. Which of the following terms is most suitable to describe a group of genetically identical individuals produced by vegetative reproduction?
1. Hybrid
 2. Family
 3. Clone
 4. Community
 5. Population

Questions 36 and 37 based on the following figure:

The figure below represents a food web in a particular ecosystem. Each letter represents a species. arrows indicate the direction of energy flow.



36. If man is the member of this ecosystem which of the following most likely represents him?

1. A 2. B 3. C 4. D. 5. E.

37. Which of the following is the herbivore in this ecosystem?

1. A 2. B 3. C 4. D. 5. E.

38. Which of the following is **incorrect** regarding ecosystems?

1. Wet pattanas grass land found in wet zone in Sri Lanka
2. Recycling of nutrients is very slow in the Open ocean
3. Tropical rain forests show cauliflory
4. Trees of the montane forests have columnar trunks with smooth barks.
5. Ever green trees are found in the tropical thorn forests

39. Which one of the following micro organism is used for production transgenic plants?

1. *Escherichia coli*
2. *Bacillus thuringiensis*
3. *Saccharomyces cerevisiae*
4. Tobacco mosaic virus (TMV)
5. *Agrobacterium tumefaciens*

40. Which of the following antibiotic inhibits the fungal growth by causing damage in their cell membrane?

1. Penicillin 2. Ciprofloxacin 3. Polymyxin 4. Erythromycin 5. Clotrimazole

For each Questions 41 - 50 one or more of the responses is / are correct and select the correct number according to the instructions

1	2	3	4	5
A,B,D correct	A,C,D correct	A,B correct	C,D correct	Any other combination

41. Some organs with Endocrine function the hormone secreted by them and the target structure of these hormones are given in the following table

Organ with endocrine function	Hormone	Target structure
A. Parathyroid gland	P. Progesterone	i. Intestine
B. Placenta	Q. Parathormone	ii. Mammary gland
C. Ovary	R. TRH	iii. Kidney
D. Hypothalamus	S. Oestrogen	iv. Anterior pituitary

Which of the following secretary organ Hormone Target organ combination/s is / are correct?

- A. B S ii B. D R iii C. C P iv D. A Q iii E. D Q iii
42. Examine an animal tissue under the light microscope observed that its cells are lying on a basement membrane. Which structure / structures at the following is / are most likely to be present in this tissue?
- A. Red blood corpuscles B. Elastin fibres C. Cilia
D. Microvilli E. Large matrix
43. Which of the following disease/s is / are causes by bacteria?
- A. Leprosy B. Influenza C. Leptospirosis D. Botulism E. Hepatitis A
44. Which of the following is / are common for Brittle star, Sea cucumber and Sea Lilly?
- A. Lack pedicellaria B. Have endoskeleton C. Tube feet with suckers
D. Lack gills E. Having arms
45. Which of the following statements is / are **incorrect** regarding the human placenta?
- A. Structure is formed from two organisms
B. Act as an endocrine organ
C. Fetus is protected from high blood pressure of the mother
D. It prevents the transmission of pathogenic micro organisms reaching the fetus
E. It helps to replace erythrocytes used by fetus and receiving new one from the mother
46. Which of the following organelles and their relative function/s is / are **incorrect**?
- A. Lysosome - Detoxification
B. Nucleolus - Protein synthesis
C. Mitochondria - Oxidative phosphorylation
D. Smooth Endoplasmic reticulum - Transcription
E. Chloroplast - Photolysis of water

47. Which of the following statements regarding human eye is / are correct?
- A. Cornea is an extension of sclera
 - B. Fovea does not contain rods
 - C. Ciliary muscles are involved in the control of diameter of pupil
 - D. Vitreous humor controls the amount of light that enters the eye
 - E. In the retina number of cones are greater in number than the rods
48. Which of the following event/s take/s place when heat gain centre in the hypothalamus is stimulated during the regulation of the body temperature in human?
- A. Increase in the activity of sweat glands
 - B. Inhibition of adrenal activity
 - C. Contraction of smooth muscle fibres
 - D. Contraction of skeletal muscle fibres
 - E. Stimulation of Krause's end bulbs
49. In a living cell which of the following molecule/s broken down as acetyl co-A and enter the citric acid cycle?
- A. Amino acids B. Fatty acids C. ATP D. Pyruvate E. Nucleic acids
50. If a mother with blood group B⁻ deliver a child with blood group A⁺, Which **cannot** be the blood group/s of the father?
- A. O⁺ B. A⁺ C. A⁻ D. B⁺ E. AB⁺

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General Certificate of Education (Adv. Level) Pilot Examination - 2015

Biology II
உயிரியல் II

09 E II

Three hours
மூன்று மணித்தியாலங்கள்

Index No.:

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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 ofr 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	

Part - II

A. Structured Essay

Answer all questions in this papers

1. A. i. Indicate three general characters of carbohydrates.

.....

.....

.....

ii. Indicate an example carbohydrate for the following functions.

a. Involve in the formation of the structure of carbon dioxide acceptor in photosynthesis

.....

b. Formation of the structure of genetic material in living organisms

.....

c. Formation of exoskeleton of arthropods.

.....

d. Only cell wall component of red algae.

.....

e. Formation of structure of ATP

.....

iii.a. In which type of lipid found in plasma membrane of Eukaryotes?

.....

b. What are the component are obtained from the hydrolization of the above lipid?

.....

c. What in the steroid generally found in the human blood?

.....

d. What is the unique feature found in the cell membrane of Domain Archaea that differentiates from the other two domains?

.....

iv. a. In which cellular organelle the synthesis of lipids takes place?

.....

b. Give two functions of the above mentioned organelle other than the synthesis of lipid.

.....

.....

B i. What is cell cycle?

.....

.....

.....

.....

- ii. Name three functional phases of the inter phase of the cell cycle and give a major event for each phase

	Phase	Major event
1.
2.
3.

- iii. a. What is the name of the recently accepted model for plasma membrane?

.....

b. What is the reason for the above name?

.....

.....

- iv. What is co-enzyme?

.....

.....

- v. Name a co-enzyme that is involved in the cellular respiration and indicate its function.

co-enzyme.....

Function.....

- C. i. What is binomial nomenclature?

.....

.....

- ii. Write the phylum for the given characters.

a. Homosporous, Dioecious gametophyte.

Motile gametes.....

b. Heterosporous, motile gametes, seeds.

.....

c. Suckers, Tentacles, Parapodia

.....

d. Statocyst, ommatidium, internal fertilization

.....

e. Zoospores, motile gametes, saprophytic nutrition.

.....

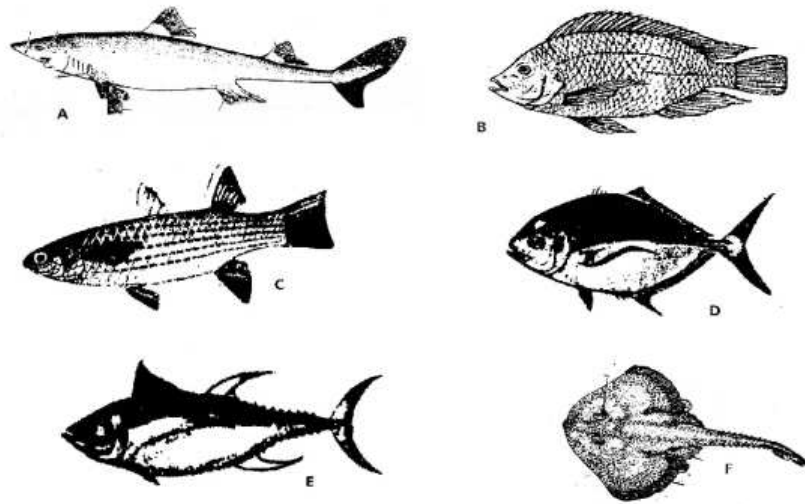
- iii. What is artificial dichotomous key?

.....

.....

.....

iv.



Classify the above fishes (A-F) using the dichotomous key provided below.

1. Have bony operculum
- Have no operculum.....
2. Have Ventral eyes.....
- Have lateral eyes.....
3. Have secondary fins.....
- Have no secondary fins.....
4. Have two spines separated from and fins.....
- No such spines.....
5. Have single dorsal fin.....
- Have double dorsal fins.....

v. The above organisms can be included in two classes. Name such classes.

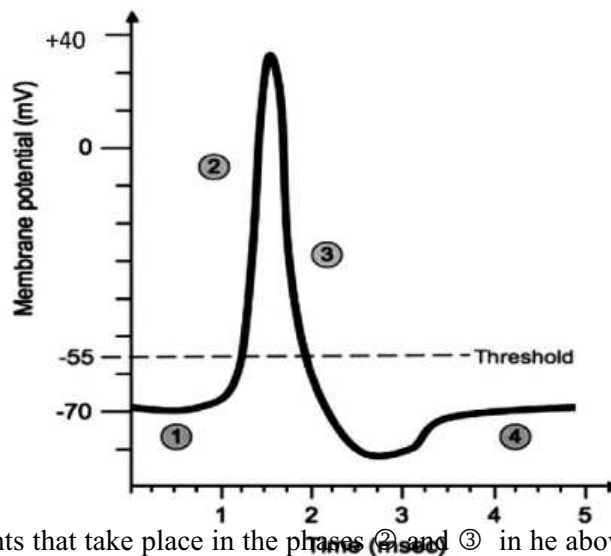
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2.A.i. a. What is resting potential?

b. What are the three factors responsible for the resting potential in a nerve cell?

ii. a. What is action potential?

b. The following diagram shows the membrane potential during an action potential is generated in a neurolemma of a neuron



Briefly describe the events that take place in the phases ② and ③ in the above diagram.

- ②
- ③

iii. Indicate the part of the human brain for the following functions.

a. Maintaining posture.

.....
b. Controls the reflex movement of eye muscles.

.....
c. Integrates sensory information.

.....
d. Control the mental emotions.

.....
iv. What is reflex arc?

.....
v. What are the components of simple reflex arc?

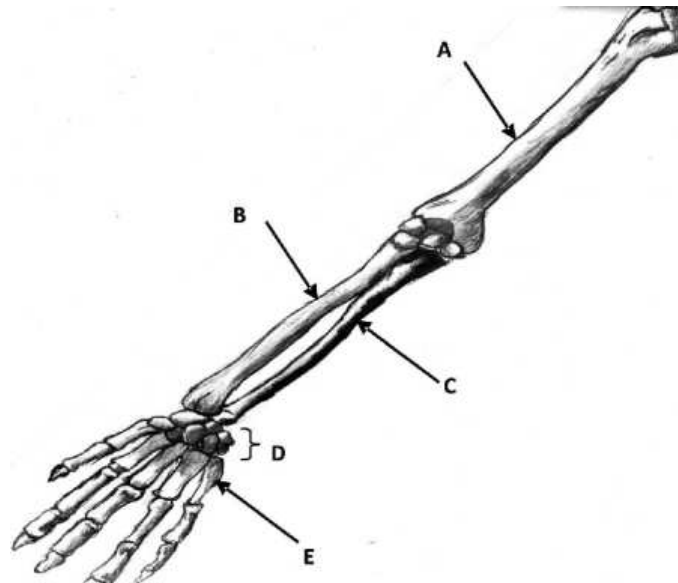
.....
vi. What is the contribution of circulatory system in co-ordination?

.....
B i.a. What is pulse pressure?

.....
b. Indicate four human that retaliate the human blood pressure.

.....
ii. What is hyper tension in human?

.....
iii. The following diagram shows the human upper limb



Name the parts A - E in the above diagram

A.

B.

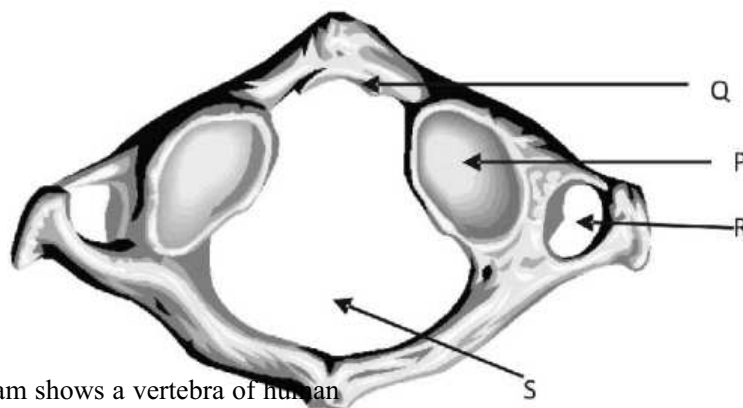
C.

D.

E.

iv. In which bone the bone A proximally articulates? and indicate the specific part of the articulation.

Bone Specific part.....



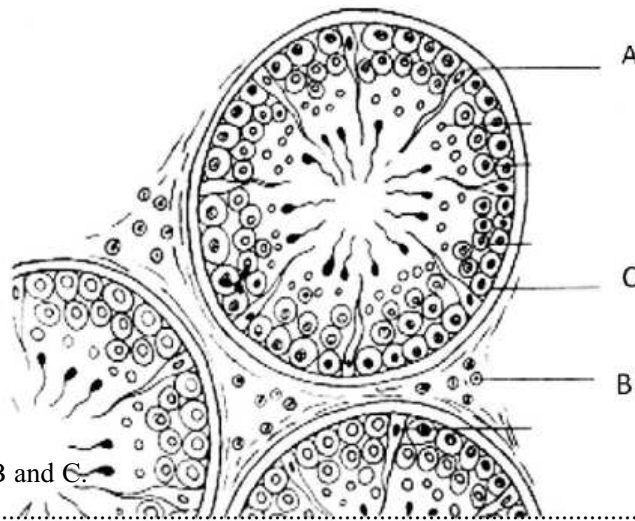
The above diagram shows a vertebra of human

v. a. Identify the above vertebra

b. Name P,Q,R,S in the above diagram

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

C. The following diagram shows the cross section of human testis.



i. Name the cells A,B and C.

A.

B.

C.

ii. Indicate three functions of cell A.

.....

.....

.....

iii. Name one hormone influences in the given cell type.

A.....

B.....

iv. a. What is meant by hyper activation?

.....

b. What is the significance of the above in the fertilization?

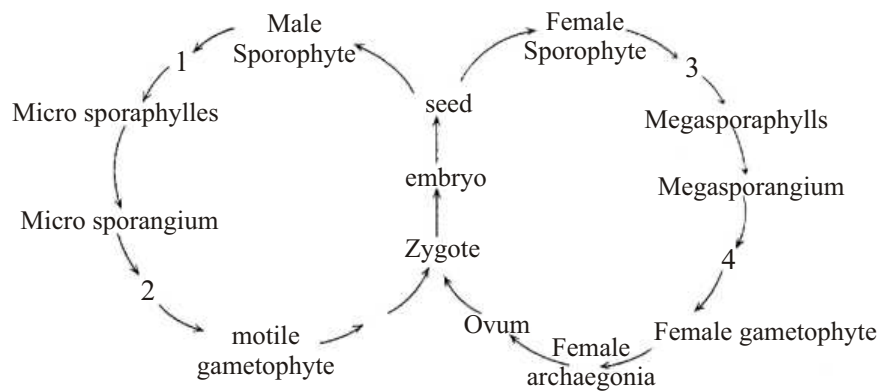
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.....

b. Which ion is involved with the Capacitation?

.....

vi. The following diagram shows the different stages found in the life cycle of Cycas.



a. Name 1 - 4 in the above stages.

1. 2.
3. 4.

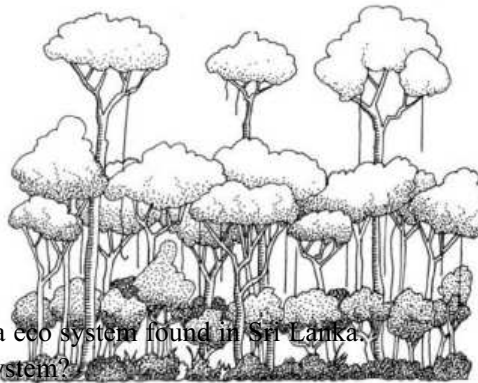
b. What is the resubalance part of stamen of flowering plants in the above diagram.

.....

c. Which parts can not be seen in flowering plants in the above diagram?

.....

3. A.



The above diagram shows a eco system found in Sri Lanka.

i.a. Identify the above ecosystem?

.....

b. Give two special features regarding the plants in the lateral view.

.....

.....

ii. In which climatic zone the above eco system found in Sri Lanka?

.....

iii. What are the reasons for the above ecosystem is considered as bio diversity hot spot of the world?

iv. What is biome?

v. Indicate three biomes in temperate zone.

vi. Name the biomes that show the following characters.

1. Evergreen trees with acicular leaves

2. Evergreen trees with broad leaves

3. Small herbs with short life shrubs

4. Grass land with fire adopted trees

B. i. What is the extinction of species?

ii. What is the significance of extinction that naturally occurs?

iii. Give the organisms that extinct in the mass extinction in oceans at different periods and the periods of extinction

Organisms

Period

.....

iv. a. What is IUCN Red Data Book?

.....

.....

b. Give four IUCN Groups from the highest threatens to a correct sequential order and give one example.

IUCN group	Example
1.
2.
3.
4.

v. Indicate the major features of the following convention of bio diversity.

CITES.....

Ramsar.....

C. i. a. Which hypothesis is accepted to the origin of life on earth?

.....

b. Name the biologists that proposed the above hypothesis

.....

ii. a. What is Hardy - Weinberg equilibrium?

.....

.....

b. Give four factors which maintain the above equilibrium

.....

.....

.....

.....

iii. Darwin's theory of evolution is based on some special observations on natural population and deduction of some inferences. Name such important observations of him.

.....

.....

iv. What is mutation?

.....

.....

v. Indicate human disorders that happens due to recessive gene mutation

.....

.....

vi. a. Which is the simple technology that is used to separate DNA fragments in laboratory?

.....

b. What are DNA probes?

.....

.....

.....

4. A.i. What is meant by sterilization in microbiology?

.....

.....

ii. Briefly describe the sterilization method for the followings.

.....

a. Thermo stable culture media

.....

.....

b. Petri dishes

.....

.....

.....

iii. Indicate three physical changes take place in spoiled foods by micro organisms.

.....

.....

iv.a. What is intoxication of food?

b. What is the causative microbe that responsible for canned foods?

v. Indicate the bacterial species that involves in the following in diestrual products.

a. Synthesis of amino acids.....

b. Production of vinegar.....

c. Bio pesticide.....

vi. Indicate the bacterial species regarding the following chemical changes is the nitrogen cycle.

a. NO_3^-

N_2

b. NO_2^-

NO_3^-

c. N_2 .

NH_4^+

B. i. a. What is stomata?

b. What is the major function of stomata?

ii. Make a fully labeled diagram of he surface view of a stoma in a dicotyledonous leaf to show its structure as seen under the high power of a light microscope.

iii. What is transpiration?

iv.a. Name an apparatus to measure the transpiration.

.....

b. Give three important parameters taken before to setup of the above mentioned meter.

.....

.....

v. What are the four adaptations that have plants to reduce transpiration?

.....

.....

.....

.....

C. i. What is plant growth substances?

.....

.....

.....

ii. Which plant growth substance is conducted through phloem tissue in plants?

.....

iii. Indicate the major plant growth substance for the following processes.

1. Ripening of fruits.....

2.Delay senescence.....

3.Prevent water loss during drought... ..

4.Break seed dormancy.....

5. Induce flowering.....

iv.,Indicate two lateral meristems participates in secondary growth of dicotyledonous plants and give two permanent tissues that produced by them.

1.

2.

.....

.....

.....

v. a. What is wood?

.....

b. How functionally differ heart wood from sap wood?

.....

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மொராட்டுவை பல்கலைக்கழக பொறியியற்பீட தமிழ் மாணவர்கள் நடாத்தும்
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முன்னோடிப் பரீட்சை - 2015

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General Certificate of Education (Adv. Level) Pilot Examination - 2015

Biology II

உயிரியல் II

09

E

II

Part - II

B. Essay

Answer Any Four Questions

5. a. Describes the fine structure of mitochondria.
b. Describe the events that takes place during a glucose molecule as a substrate under go complete oxidization and generate energy in an eukaryotic cell.
6. a. Briefly describe the gross structure of human lungs.
b. Explain the role of nervous control in normal ventilation of human lungs.
c. Briefly give the illness of cigarette smoking
7. a. Describe the gross structure of human eye.
b. Indicate the functions of each part of the human eye.
8. Write an essay in natural resources and their judicious use.
9. Briefly describe the role of micro organisms in the following processes.
a. Extraction of metals b. Bio remediation c. Pathogenecity
10. Write short notes on the followings:
a. Formation of urine in human
b. Micro propagation
c. Epistasis

* * *

