



Fourth Term Examination - 2022

Conducted by
Field Work Centre, Thondaimanaru.

Biology

Two Hours

09

E

I

Gr -13 (2022)

- ❖ Answer **all** questions.
- ❖ In each of the question 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 (X)** on the number using blue or black pen.

01) Which of the following can be considered as an adaptation?

- (1) Insulin secretes when the blood glucose level rises.
- (2) Viviparity in some mangroves.
- (3) Irreversible changes that occur during the life span.
- (4) Genes that pass from one generation to the next.
- (5) For efficient biological activities, there is an order from molecules to biosphere.

02) Organic compound that has a glycosidic bond

- | | | |
|--------------------|------------|-----------------------|
| (1) Glyceraldehyde | (2) ATP | (3) NADP ⁺ |
| (4) Sucrose | (5) Inulin | |

03) a. Phospholipid

b. Cholesterol

c. Protein

d. Glycolipid

e. Glycoprotein

Substance / substances that maintains / maintain the fluidity of plasma membrane

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

04) The following events take place in the mitosis.

- a. Microtubules attached to kinetochore get shorten and pull sister chromatids.
- b. Spindle microtubules get depolymerized.
- c. Kinetochore attaches the sister chromatids of each chromosome.
- d. Each chromosome attached to the kinetochore microtubule at the centromere.
- e. Chromosomal arms of the sister chromatids attached by proteins called cohesion.

Correct sequential order.

- | | | |
|-------------------|-------------------|-------------------|
| (1) e, c, d, a, b | (2) e, d, c, a, b | (3) a, c, b, d, e |
| (4) d, a, c, e, b | (5) e, a, b, c, d | |

05) Enzymes

- (1) increase the velocity of reactions by reducing the activation energy.
- (2) contain active sites which can combine the activators.
- (3) need proteinous cofactors for the catalytic activities.
- (4) alter the nature of the end products.
- (5) are not being used up during the reaction.

06) In the Calvin cycle of photosynthesis,

- (1) PEP carboxylase enzyme involves in the carbon fixation first time.
- (2) glyceraldehyde-3-phosphate would be reduced.
- (3) decarboxylation takes place during reduction.
- (4) regeneration of RuBP needs energy in the form of ATP.
- (5) only NADPH could be needed for the reduction.

07) When a leaf of a maize plant placed in the sunlight,

- (1) PS I, PS II light reactions occurs in the bundle sheath cells.
- (2) only the malate can be transported via plasmodesmata.
- (3) regeneration of PEP takes place in the mesophyll cells.
- (4) mesophyll cells generate pyruvate.
- (5) photorespiration takes place where there is an intense light.

08) The process that takes place during the glycolysis not in the Krebs cycle.

- | | |
|--------------------------------|-------------------------------------|
| (1) Production of NADH; | (2) Production of FADH ₂ |
| (3) Substrate phosphorylation | (4) Utilization of ATP |
| (5) Release of CO ₂ | |

09) Eon / eons that in include / includes the Cenozoic era?

- | | | |
|-----------------|---------------------------------|--------------|
| (1) Phanerozoic | (2) Proterozoic | (3) Archaean |
| (4) Hadean | (5) Proterozoic and Phanerozoic | |

10) The plant phylum having the least developed gametophytes.

- | | | |
|----------------|----------------|----------------|
| (1) Bryophyta | (2) Anthophyta | (3) Pterophyta |
| (4) Gnetophyta | (5) Lycophyta | |

11) The following characteristic features are found in an animal class.

- Possess lungs for gaseous exchange.
- Ectothermic.
- Eggs without shells.

Another characteristic found in the above-described animal class.

- (1) Marine habitat.
- (2) Diaphragm.
- (3) Four chambered heart.
- (4) Skin without scales.
- (5) Differentiated teeth.

12) The followings are some characteristics of fungal reproduction.

Phylum	Reproductive structure	Reproduction
a. Chytridiomycota	p. zygosporangium	x. sexual reproduction
b. Zygomycota	q. ascus	y. asexual reproduction
c. Ascomycota	r. basidium	
d. Basidiomycota	s. conidium	

Correct combination

- (1) a, p, x (2) d, s, x (3) b, p, x (4) c, q, y (5) c, s, y

13) Compared with the meristematic region in the stem apex, root apex meristematic region

- (1) contains cells in anaphase II of cell division.
- (2) shows only primary growth.
- (3) protected by leaf primordia.
- (4) produces vascular cylinder.
- (5) contains differentiated cells.

14) *Tradescantia* epidermal peels were placed in sucrose solutions with different concentrations. Select correct the statements regarding this experiment.

- (1) Turgid, flaccid and incipient plasmolyzed cells can be observed under the microscope.
- (2) When sucrose concentration increases, more cells become turgid.
- (3) Solute potential of the tissue is calculated based on the solution that would give 50% plasmolysis.
- (4) Cells of the epidermis are observed under the microscope.
- (5) There is linear relationship between concentration of solutions and percentage of plasmolysis.

15) Correct comparisons between vessel elements and tracheids.

Vessel elements

- (1) Contain thick wall
- (2) Found only in angiosperms
- (3) Contain tapering end
- (4) Lignin found in secondary wall
- (5) Water flows from end to end through perforation plates.

Tracheids.

- Contain thin wall.
Found only in gymnosperms.
Cylindrical shaped.
Lignin is not found in secondary wall.
Water moves from end to end through pits.

16) Which of the following statement is correct regarding cork cambium?

- (1) It arises in the outer layer of cortex in roots.
- (2) It arises in the outer layer of pericycle in stems.
- (3) Cork cambium and tissues that produces are collectively called periderm.
- (4) Cork cells that produced by it have a waxy deposit called suberin and they become dead cells.
- (5) For gaseous exchange there are lenticels which are surrounded by guard cells.

17) Constitutive elements of a chlorophyll molecule.

- (1) N and Mg (2) N and P (3) S and Mg
(4) N and Fe (5) Fe and B

- 18) Combination of plant growth regulators regarding apical dominance, which act antagonistically.
- | | |
|-------------------------------|----------------------------|
| (1) Auxin- gibberellins. | (2) Auxin - cytokinin |
| (3) Absciscic acid - ethylene | (4) Auxin - absciscic acid |
| (5) Gibberellins – cytokinin | |
- 19) Pollen tube
- (1) participates in the transportation of sperms in seed plants.
 - (2) grows with the stimulation of cytokinin.
 - (3) which involves in the absorption of nutrients from the nucellus in *Cycas*.
 - (4) found in all vascular plants.
 - (5) participates in cross pollination.
- 20) A response to the moderate soil salinity.
- (1) Increase the synthesis of absciscic acid.
 - (2) Produce solutes that are well tolerated at high concentrations.
 - (3) Produce poisonous glands.
 - (4) Develops salt glands in roots.
 - (5) Increase the proportion of unsaturated fatty acids in the plasma membrane.
- 21) Correct statement regarding the associated glands of the alimentary canal.
- (1) They include only liver and pancreas.
 - (2) The functional unit of the liver is hepatocytes.
 - (3) Between the pair of columns of cells there are bile canaliculi.
 - (4) A large number of lobules are found in the pancreas.
 - (5) Both liver and pancreas act as endocrine glands.
- 22) Correct statement regarding the basic plan of the human blood circulatory system.
- (1) First aorta branches into carotid artery.
 - (2) Double circulation occurs at different time.
 - (3) Right ventricles pump the oxygen poor blood into the two lungs via pulmonary arteries.
 - (4) Capillary beds are directly form from major arteries.
 - (5) Pulmonary circulation takes oxygen rich blood in to the lungs.
- 23) Location of AV node in the human heart.
- | | |
|---------------------------------------|---------------------------------------|
| (1) Inter ventricular septum. | (2) Wall of the left and right atria. |
| (3) Right atrium. | (4) Left ventricle. |
| (5) Wall of the atrium and ventricle. | |
- 24) Correct statement regarding the structure and function of the human respiratory system
- (1) Vocal cord produces sound when inspired air rushes the vocal cord.
 - (2) Mucus escalator is the removal of mucus into the pharynx.
 - (3) Parietal pleura adheres the outer surface of the lungs.
 - (4) Larynx is strengthened by muscles.
 - (5) In the respiratory passage air is warmed to the body temperature.

- 25) Which one of the following statements is correct regarding inflammatory response?
- (1) It's the barrier defense of the innate immunity.
 - (2) During inflammation, activated complement proteins can cause further histamine release.
 - (3) Constriction of blood vessels causes redness.
 - (4) Histamine mainly released by mast cells, causes increased permeability and constriction of blood vessels.
 - (5) Phagocytes do not move and aid in the tissue repair.
- 26) An organism consists of excretory structure with cilia.
- (1) *Hydra* (2) *Planaria* (3) Cockroach (4) Prawn (5) Bat
- 27) Correct regarding formation of urine.
- (1) Secretion is an active process.
 - (2) Secretion occurs in the proximal convoluted tubule and collecting duct.
 - (3) Aldosterone induces the reabsorption water in the collecting duct.
 - (4) Reabsorption of K^+ occurs actively in proximal convoluted tubule.
 - (5) Reabsorption of water occurs in both arms of loop of Henle.
- 28) Correct comparison regarding sympathetic and parasympathetic systems.
- | Sympathetic | Parasympathetic |
|---|---|
| (1) Nerves arise only from the base of the brain. | Nerves arise from spinal cord. |
| (2) Exit as spinal nerves. | Exit as spinal and cranial nerves. |
| (3) Acetylcholine is secreted. | Nor epinephrine is secreted. |
| (4) Promote calming. | Prepare body with stressful situations. |
| (5) Ganglia found far from spinal cord. | Ganglia found near the spinal cord. |
- 29) Correct regarding accommodation of eye.
- (1) In nearer vision, there would be a reduction of the pull of suspensory ligaments.
 - (2) In nearer vision, ciliary body move outwards towards the lens.
 - (3) When seeing distant objects, convexity of the lens is increased.
 - (4) When seeing distant objects, the ciliary muscles contract.
 - (5) When seeing a distant vision, ciliary body moves towards the lens.
- 30) Parathyroid glands
- (1) are embedded in the anterior surface of the thyroid gland.
 - (2) secrete a hormone that promotes storage of calcium within bone tissues.
 - (3) secrete PIH.
 - (4) secrete a hormone that promotes calcium absorption through small intestine.
 - (5) secrete a hormone that inhibits calcium reabsorption in the kidney tubules.
- 31) a. Constriction of blood vessels b. Secretion of sweat
 c. Shivering d. Contraction of hair erector muscle
- Which of the above is / are heat gain mechanism / mechanisms?
- (1) a, b, c and d (2) a, c and d (3) c and d (4) Only c (5) a and b

32) Select the correct statement regarding spermatogenesis.

- (1) It takes ten weeks to produce a mature sperm from spermatogonium in the seminiferous tubules.
- (2) Hundreds of millions of sperms are produced each day by spermatogenesis.
- (3) In spermatogenesis one spermatogonium produces many sperms.
- (4) In spermatogenesis only meiosis I and II cell divisions are involved.
- (5) Spermatogenesis is a discontinuous sequence.

33) An early site for the formation of blood cells in human embryo.

- | | | |
|--------------|-------------|--------------|
| (1) Amnion | (2) Chorion | (3) Placenta |
| (4) Yolk sac | (5) Liver | |

34) Correct regarding typical vertebra of human.

- (1) Vertebral arch is the continuation of its body.
- (2) Its spinous process is bifid.
- (3) A superior process is found above the vertebral arch.
- (4) It has foramen for vertebral artery.
- (5) Its vertebral arch has two pairs of articular surfaces.

35) Number of bones that make the thoracic cage in human.

- (1) 25 (2) 39 (3) 37 (4) 13 (5) 27

36) Which of the following statement is correct regarding alleles?

- (1) An allele is the basic unit of the inheritance.
- (2) An allele encodes for a particular character.
- (3) The alternative version of gene is called allele.
- (4) Number of alleles found in polyallelism is two.
- (5) Alleles are located in different loci of a chromosome.

37) A cross between AaBb and aabb resulted in the following genotypic ratio.

AaBb – 25% Aabb – 25% aaBb – 25% aabb – 25%

The ratio of obtaining AABB among the offspring from the cross between AaBb x AaBb.

- (1) $\frac{1}{4}$ (2) $\frac{1}{16}$ (3) $\frac{3}{16}$ (4) $\frac{9}{16}$ (5) $\frac{6}{16}$

38) In which of the of the external feature, can the genotype be known as soon as it is seen?

- | | |
|-----------------------|----------------------|
| (1) Rolling tongue | (2) Dimples on cheek |
| (3) Attached ear lobe | (4) Straight thumb |
| (5) Widow's peak | |

39) One of the parents has blood group O. These parents have a probability of 50% of bearing a child that has blood group O. The genotype of the other parent.

- | | | |
|---------------|---------------|---------------|
| (1) $I^A I^B$ | (2) $I^A I^A$ | (3) $I^B I^B$ |
| (4) ii | (5) $I^A i$ | |

40) Select the correct statement of the followings.

- (1) Doubling of genes does not lead to the polyploidy.
- (2) Inbreeding increases the hybrid vigour.
- (3) Mutations leads to modified gene pool.
- (4) There would not be genetic variations due to immigration and emigration.
- (5) To maintain the Hardy-Weinberg equilibrium allelic(gene) frequencies will be altered.

➤ Use the following instructions for the questions 41– 50.

A B D correct	A C D correct	A B correct	C D correct	Any other response
1 st Answer	2 nd Answer	3 rd Answer	4 th Answer	5 th Answer

41) Which of the following statement / statements is/are correct regarding proteins?

- A. As a result of coiling and folding of a single polypeptide chain, secondary structure forms.
- B. Hemoglobin protein contains both α and β sub units.
- C. All the proteins get modified within the cell.
- D. Three-dimensional shape of the tertiary proteins resulting from interactions between the side chains or R group of the amino acids.
- E. Some quaternary structure proteins consist of only one polypeptide chain.

42) Molecule / molecules that can be formed during the photosynthetic pathways.

- A. Pyruvate B. FAD C. NADP⁺ D. RuBP E. Acetyl Co - A

43) The following are some characteristics found among some protists.

- Cell wall
- Multicellular thallus
- Pellicle

Select the response / responses that indicate / indicates the correct sequential order regarding the above characteristics of the organisms.

- A. *Ulva, Gelidium, Euglena.*
- B. *Gelidium, Sargassum, Paramecium.*
- C. *Euglena, Gelidium, Paramecium.*
- D. *Diatom, Euglena, Paramecium.*
- E. *Sargassum, Gelidium, Amoeba.*

44) In phloem translocation,

- A. loading always an active process.
- B. forces the sap under a negative pressure.
- C. sinks usually receive sugar from the nearest sugar source.
- D. phloem sap can be transported in opposite directions.
- E. water cannot move by osmosis.

- 45) The reason / reasons that the life cycle of *Nephrolepis* differs from life cycle of *Pogonatum* In *Nephrolepis*
- A- presence of archegonia.
 - B- presence of photosynthetic gametophytes.
 - C- presence of sori.
 - D- presence of prothallus.
 - E- presence of sporophylls.
- 46) Structure / structures always found in an epithelial tissue.
- A. Nucleus
 - B. Matrix
 - C. Basement membrane
 - D. Cilia
 - E. Collagen fibre.
- 47) Which of the following / followings is / are warmth receptors?
- A. Krouse end bulbs
 - B. Merkel's disc
 - B. Ruffini corpuscle
 - D. Free nerve endings
 - F. Meissner's corpuscle.
- 48) Hormone / hormones that inhibits / inhibit the secretion of milk in pregnant as well as normal women,
- C. hCG
 - B. Estradiol
 - C. Progesterone
 - D. PIH
 - E. PRH
- 49) Which of the following / followings is / are correct regarding human skeleton?
- A. There are 26 bones found in the vertebral column.
 - B. The largest, single vertebral bone is the sacrum.
 - C. The first pair of rib is firmly fixed with the sternum and first thoracic vertebra.
 - D. Mastoid process is found at the behind of the temporal bone.
 - E. Except atlas and axis other cervical vertebrae have bifid spinous process.
- 50) Which of the following statement / statements is / are correct regarding non-Mendelian inheritance?
- A. In both epistasis and polygenic inheritance, two or more genes are involved in determining a particular phenotype.
 - B. Co-dominance shows 1: 2: 1 phenotypic ratio.
 - C. Human blood group is the example for polygenic inheritance.
 - D. Both dominant alleles are necessary for the expression of purple colour in sweet pea plants which shows recessive epistasis.
 - E. Back cross should be done to determine the genetic linkage.



Fourth Term Examination – 2022

Conducted by

Field Work Centre, Thondaimanaru.

Biology

- II

Three Hours ten min.

09

E

II

Gr -13 (2022)

Index No:

Instructions:

- ❖ This question paper consists of **10** questions in **12** pages.
- ❖ This question paper comprises Part **A** and **B**. The time allotted for **both parts** is **three hours**. (Additional reading time is **10 minutes**)
- ❖ Use additional reading time to go through the question paper, select the questions and decide on the questions that you give priority in answering.

Part A – Structured essay (Pages 2 – 11)

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

Part B – Essay (Page 12)

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

For examiner's use only

Part	Question No.	Marks
A	01	
	02	
	03	
	04	
B	05	
	06	
	07	
	08	
	09	
	10	
Total		

In numbers	
In words	

Examiner 1	
Examiner 2	
Checked by	
Supervised by	

A – Structured Essay

❖ **Answer all questions in this paper itself.**

(Each question carries 100 marks)

01. A) i) Irritability, reproduction and evolution are some characteristics of organisms.

What is meant by each of them?

Irritability

.....

Reproduction

.....

Evolution

.....

ii) Due to cohesion between water molecules, water and minerals can be transported via xylem.

Name another ability of water due to cohesion.

.....

iii) Indicate the major types of monosaccharides and give an example for each type.

.....

.....

iv) Name **one** sugar which is stored in some plants.

.....

v) Indicate **two** main organic compounds, that travel through the body, function as signaling molecules.

.....

vi) What is meant by magnification and resolution which are important parameters of microscopes?

Magnification

.....

Resolution

.....

B) i) a) Indicate **two** main structural components of plasma membrane.

.....

b) Which specific molecule interact with the protein molecules found in the plasma membrane.

.....

.....

.....

ii) Indicate an organelle each of the following function.

a) Produce transport vesicle along with storage of Ca⁺⁺

b) Regulation of osmosis

iii) a. What is cell cycle?

.....
.....

b. Indicate the events that take place in the S phase.

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

iv). Indicate **one** function of each protein.

a. **Kinetochores**

.....

b. **Cohesin**

.....

v). What is Metastasis?

.....

C) i) What are the global importance of photosynthesis?

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

ii) Which photosynthetic molecule directly participates in the light dependent reactions of photosynthesis?

.....

iii) Name the origin of the electrons which could neutralize the photo system I and photosystem II.

Photosystem I

Photosystem II

iv) Briefly describe the regeneration of carbon dioxide acceptor, one of the steps, in the Calvin cycle.

.....
.....

v). How bundle sheath cells are interconnected tightly with mesophyll cells in C4 plants?

.....

vi). What is the importance of C4 plants having only PS I and not having PS II in bundle sheath-cells?

.....

vii). Briefly explain how the enzymatic activities are regulated by cooperativity.

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

viii). Indicate an example for the irreversible inhibitor.

.....

02. A) i) Write in correct sequence, **four** main stages by which the proto cell have been produced according to the theory of biochemical evolution.

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

ii) Name the Kingdom / Kingdoms of biological classification that was introduced by Robert Whittaker.

.....

iii) Name **two** protists which possess both contractile vacuoles and food vacuoles.

.....

iv) Indicate **three** characteristics that can be seen only in nematodes.

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

v) Indicate **three** characteristics that can be seen in bony fishes and that cannot be seen in cartilaginous fishes.

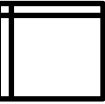
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B) i) Indicate **two** characteristics common to both parenchyma cells and collenchyma cells.

.....
.....

ii) Name the plant phyla that could possess vessel elements.

.....



iii) Which allows the movement of fluid from one sieve tube to the next?

.....

iv) How the pericycle of a monocot root differs from the pericycle of a dicot root?

.....

.....

v) Briefly describe the leaf orientation to prevent the possible damage caused by exposure of leaf to the over intense light.

.....

.....

vi) How the guard cells get the energy to accumulate K^+ ?

.....

.....

vii) a. Give the water potential equation.

.....

b. State whether the value of Ψ_p is higher than or lower than or equal to the value of Ψ_s when a flaccid plant cell was immersed in pure water.

.....

C) i) a. What is apoplastic path way?

.....

.....

b. How the access to water in apoplastic path way takes place?

.....

c. Briefly describe benefits to plants by the apoplastic path way of the endodermis.

.....

.....

.....

iii) What are the significances of transpiration to plants?

.....

.....

iv) How the root pressure differs from transpiration pull?

.....

v) Which are the essential nutritional elements to plants having the atmosphere as the source?

.....

vi) What is pollination?

.....
.....

vii) a. What is parthenogenesis in some plants?

.....

c. Indicate **two** instances that the parthenogenesis takes place in some plants.

.....
.....

03. A) i) What are the functions of cholecystokinin in the regulation of digestion in human?

.....
.....

ii) a). What are essential amino acids?

.....

b). Indicate an example for an essential amino acid.

.....

iii) Name the vitamin essential for the synthesis of collagen.

.....

iv) a. How the most portion of venous blood in the coronary circulation returns?

.....

b. What is the reason for stroke?

.....

c. What is the contribution of heparin in the prevention of blood clotting within the body?

.....
.....

v) a. What is functional residual capacity?

.....

b. What is the significance of functional residual capacity?

.....

c. Name an auto immune disease that is caused by the attack of T cells to destruct some cells of the body, other than neurons.

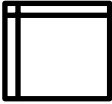
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vi) a. What is glomerulus?

.....

b. What is the significance of glomerulus in the nephron?

.....



B) i) What is nerve?

.....

ii) a. Which is the supportive cell in a nervous tissue?

.....

b. Indicate **two** functions of the above-mentioned cell in B ii) a, other than support.

.....
.....

iii) Indicate the nervous organization of leech.

.....
.....

iv) a. What are ventricles of brain?

.....

b. Which maintains a uniform pressure within ventricles of brain?

.....

v) a. Three phases are included in the action potential. Indicate that in which phase / phases the refractory period should be included.

.....

b. What is the significance of refractory period?

.....

vi) a. Give the sequential order of the path way of impulse from retina to the area of perception.

.....
.....

b. Which part of the retina contains only cones?

.....

vii) a. Name **two** cells that found in the organ of Corti.

.....

b. Which is the part of the ear that perceives position with respect to the linear movements of head?

.....

C) i) a. Name the epithelial tissue that found in the outermost layer of human skin.

.....

b. What is the function of collagen fibers in the dermis?

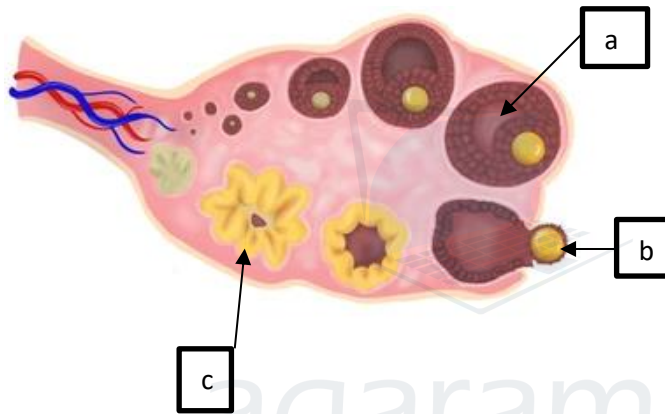
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ii) What is tropic hormone?

.....
.....

- iii) Name **two** pituitary hormones which have non-tropic effects.
.....
- iv) a. Indicate the part of the gland which secrete hormones to mediate ‘short term stress responses’
.....
- b. What is the contribution of the above-mentioned hormone in iv) a. on fat cells?
.....
- v) Name the hormone that involved in each of the following functions.
 - a) Maintenance of muscle tone
 - b) Coordination of diurnal rhythms
 - c) Synthesis of glucose from proteins
 - d) Production of milk

04. A) The following labelled diagram shows the longitudinal section of an ovary of a female.



- i) Identify a, b and c.
 - a. b.....
 - c.
- ii) Name the modified structure of lysosomes found in the structure ‘b’.
.....
- iii). Name the hormones which maintains the structure ‘c’.
.....
- iv) When the completion of oogenesis takes place in a female?
.....
- v) What is the final stage in the process of parturition?
.....
- vi) a. What is lactation?
.....
- b. Name an anti-microbial protein that found in the human milk.
.....

vii) a. What is infertility?

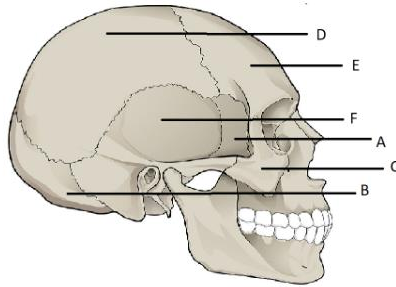
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b. How the Depo-Provera act as a birth control method?

.....

.....

B)



i) Name the bones of a human skull labelled as A,C,E and F.

A..... C.....

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

ii) Among the labelled bones of the human skull, which contains sinuses as well as forms the facial region?

.....

iii) In which bone, condyloid process of the mandible articulates?

.....

iv) Indicate **two** types of joints found in the upper arm of human.

.....

.....

v) Name the specific parts involved in the formation of wrist joint.

.....

.....

vi) a Indicate the adaptation found in the thumb allows more mobility than the other fingers.

.....

b. What is precision grip?

.....

c. Indicated **two** causative factors for osteoporosis.

.....

.....

C) i) What is meant by homozygous, phenotype and F1 generation?

Homozygous

.....

Phenotype

.....

F₁ generation

.....

ii) Indicate **two** circumstances applies for the Mendel's law of independent assortment according to current knowledge.

.....

.....

iii) Give the parental genotypes which have equal proportions of all four blood groups in the generations.

.....

iv) a. What is meant by polygenic inheritance?

.....

b. Name **two** X linked disorders.

.....

v) a. What is meant by Hardy-Weinberg equilibrium?

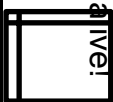
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c. What are denoted by **p** and **2pq** in the Hardy-Weinberg equilibrium?

p

2pq





Fourth Term Examination – 2022

Conducted by

Field Work Centre, Thondaimanaru.

Biology - II

Grade 13(2022)

09

E

II B

B –Essay

- **Answer four questions only.**
- **Draw fully labelled diagrams where necessary.**
- **Each question carries 150 marks.**

05. Describe the behaviour of chromosomes during meiosis and indicate the significances of meiosis.
06. a) Briefly explain the carpels of the flowering plants.
b) Describe the responses to the mechanical stimuli in plants.
07. a) Describe the grouping of ABO blood groups in human according to agglutigen and agglutinin.
b) Briefly describe the cerebrum of human and its functions.
08. a) Describe the development of human zygote and implantation.
b) Indicate the structure of the sternum of human and its significance.
09. a) Briefly describe how human sex is determined.
b) Describe the mutation breeding of breeding techniques.
10. Write short notes for the followings:
- a) Electron microscopes.
 - b) Characteristics of phylum Basidiomycota.
 - c) Positive feedback mechanism.

