

MARTHOMA RESIDENTIAL SCHOOL, THIRUVALLA
SECOND MODEL EXAMINATION 2019-2020
BIOLOGY
SCIENCE Paper -- 3
STD X
(Two hours)

Answers to this paper must be written on the paper separately.

*You will **not** be allowed to write during the first 15 minutes.*

This time is to be spent in reading the Question Paper.

The time given at the head of this Paper is the time allowed for writing the answers.

*Attempt **all** questions from **Section I** and **any four** questions from **Section II***

The intended marks for questions or parts of questions are given in brackets [].

SECTION I (40 marks)

Attempt **all** questions from this section.

Question I

- (a) Name the following. [5]
- (i) The process of conversion of several molecules of glucose into one molecule of starch.
 - (ii) Knot like masses of blood capillaries inside the Bowman's capsule
 - (iii) The type of gene which in the presence of a contrasting allele is not expressed.
 - (iv) The blood vessel which supplies deoxygenated blood to the liver.
 - (v) The soluble protein in blood plasma responsible for blood clotting.
- (b) Choose the correct answer from the four options given for each below [5]
- (i) The space between the cell wall and plasma membrane in a plasmolysed cell is filled with
 - A. isotonic solution
 - B. hypotonic solution
 - C. hypertonic solution
 - D. water
 - (ii) The cell component visible only during division
 - A. Mitochondria
 - B. Chloroplast
 - C. Chromosome
 - D. Chromatin
 - (iii) The site of maturation of human sperm.
 - A. Seminiferous tubule
 - B. Interstitial cells
 - C. Epididymus
 - D. Prostate gland

- (iv) Marine fish when placed in tap water bursts because of:
- A Endosmosis
 - B Exosmosis
 - C Diffusion
 - D Plasmolysis

- (v) The nephrons discharge their urine at the:
- A Urinary bladder
 - B Urethra
 - C Renal Pelvis
 - D Renal Pyramid

(c) Correct and rewrite the following statements by changing the underlined word [5]

- (i) Nitrogen bonds are present between complementary nitrogenous bases of DNA
- (ii) The solvent used to dissolve chlorophyll pigments while testing a leaf for starch is soda lime.
- (iii) The part of eye which can be donated from a clinically dead person is retina.
- (iv) The theory of inheritance of acquired character is proposed by Watson and Crick.
- (v) Wooden doors swell up in rainy season due to endosmosis.

(d) Give the exact location of the following. [5]

- (i) Pituitary gland
- (ii) Prostate gland.
- (iii) Loop of Henle
- (iv) Lacrimal Gland
- (v) Hydathode

(e) Differentiate between the following on the basis of what is given in brackets. [5]

- (i) Tonoplast and Plasma membrane (Location)
- (ii) Lymphocytes and Neutrophils. (Structure of nucleus)
- (iii) Active transport and diffusion (Use in plants)
- (iv) Guttation and bleeding. (Cause)
- (v) Light dependent Phase and Biosynthetic phase (Products)

(f) Choose between the two options to answer the question specified in the brackets for following .

An example is given below.

Dura mater or Pia mater (Which one is the outer layer?)

Ans: Dura mater.

- (i) Perilymph or Endolymph.(Which one surrounds the organ of corti?)
- (ii) Sclerotic layer or Choroid (Which one forms the iris?)
- (iii) LUBB or DUP (Which is the sound produced by the closure of mitral valve?)
- (iv) Vasopressin or Insulin (The deficiency of which hormone causes diabetes insipidus.)
- (v) Lenticels or Stomata (Which one remains always open?)

- (g) Given in the box are a set of 14 biological terms. Of these 12 can be grouped into 6 matching pairs. Out of it one has been done for you as an example [5]

Example: Endosmosis – Turgid cell

Cushing's syndrome, Turgid cell, Iris, Free of rod and cone cells, Colour of the eyes, Hypoglycaemia, Active transport, Acrosome, Addison's disease, Blind spot, Hyperglycaemia, Spermatozoa, Endosmosis, Clotting of blood.

- (h) Given below is an example of a particular structure and its functional activity:
Example: Kidney and Excretion. On a similar pattern complete the following [5]

- (i) Corpus Luteum and _____
- (ii) Suspensory ligament and _____
- (iii) Semi-circular canal and _____
- (iv) Myelin sheath and _____
- (v) Organ of corti and _____

SECTION II (40 marks)

Attempt any **four** questions from this section

Question 2

- (a) Given below is a diagram representing a stage in mitotic cell division. Study it carefully and answer the questions that follow: [5]



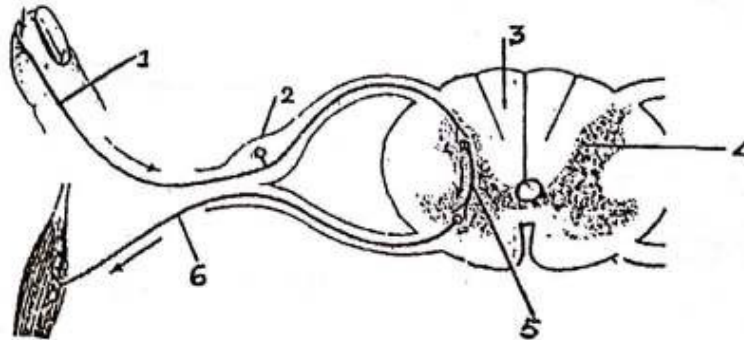
- (i) Is it a plant cell or an animal cell? Give a reason to support your answer
- (ii) Identify the stage shown
- (iii) Name and draw the stage that follows the one shown here. How is that stage identified?
- (iv) How will you differentiate between mitosis and meiosis on the basis of the number of chromosomes in the daughter cells?
- (v) Draw a duplicated chromosome and label its parts

(b) Give biological explanations for the following:

- (i) Colour blindness is more common in men than in women.
- (ii) Carbon monoxide is dangerous when inhaled
- (iii) When an ovum gets fertilized menstrual cycle stops temporarily in a women.
- (iv) People in hilly region suffer from goitre
- (v) Some women have facial hair like beard and moustache.

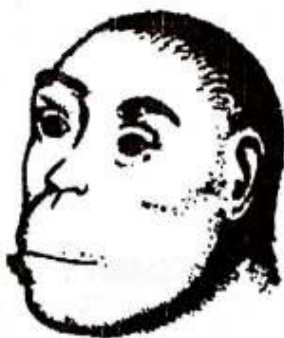
Question 3

(a) The diagram given below is a representation of a certain phenomenon pertaining to the nervous system. Study it carefully and answer the questions that follow [5]



- (i) Name the phenomenon that is being depicted
- (ii) Give the technical term for the point of contact between the neurons
- (iii) Name the parts 1, 2, 3 and 4.
- (iv) Write the functions of parts 5 and 6
- (iv) Draw a labelled diagram of a myelinated neuron

(b) Given below are two stages in the evolution of man. Study the stages and answer the questions that follow: [5]



(A)

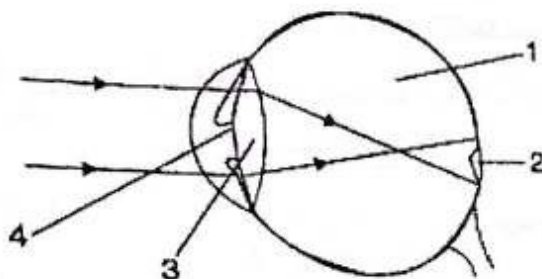


(B)

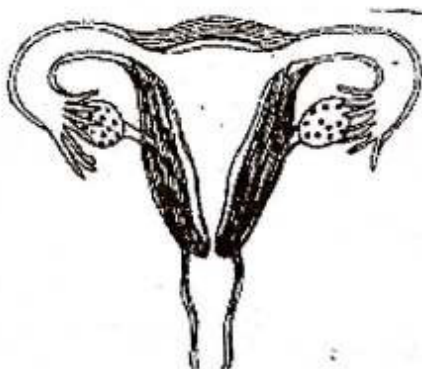
- (i) Identify the ancestral stages A and B
- (ii) Mention two characteristic features each for the two stages
- (iii) Who proposed the theory of Natural selection?
- (iv) Name the organism used to study industrial melanism
- (v) Give two vestigial organs in man

Question 4

- (a) Give below is a diagram depicting a defect of human eye. Study it and answer the questions that follow [5]



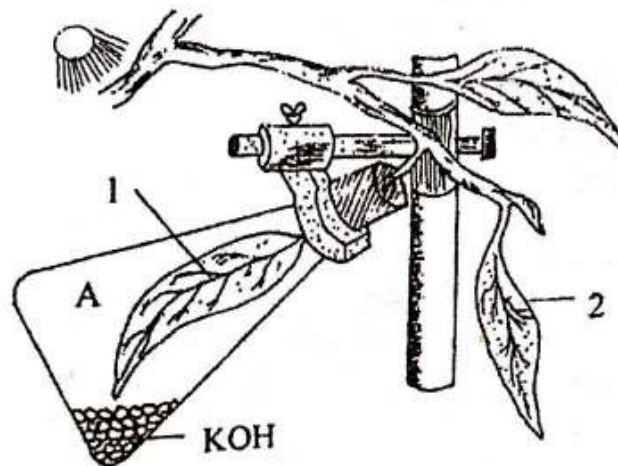
- (i) Name the defect.
(ii) Give two possible causes for this defect
(iii) Name the parts numbered 1 to 4
(iv) Name the type of lens used to correct this eye defect
(v) Draw a neat labelled diagram of inner ear and name the parts responsible for static balance.
- (b) Given below is a diagrammatic representation of the ventral sectional view of the female reproductive system [5]



- (i) Redraw the same on your answer sheet and then fill in and label the following parts:
1. Right ovary
 2. Uterus
 3. Placenta
 4. Embryo
 5. Amnion
 6. Oviducal funnel
- (ii) State the functions of:
1. Placenta
 2. Amniotic fluid
- (iii) Using the symbol 'X' indicate the region in the diagram where fertilisation occurs.

Question 5.

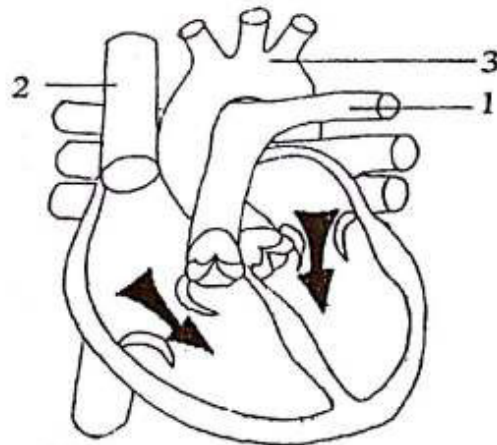
- (a) A homozygous tall plant (T) bearing red flowers(R) is crossed with a homozygous dwarf plant (t) bearing white flowers (r): [5]
- (i) Give the phenotype and genotype of the F1 generation
 - (ii) Mention the possible combinations of the gametes that can be produced from F1 hybrid plant
 - (iii) Name and state the law that explains the above cross.
 - (iv) Mention the phenotypes of the offsprings obtained in the F2 generation
 - (v) What is the phenotypic ratio obtained in the F2 hybrid
- (b) The figure given below represents an experiment to demonstrate a particular aspect of photosynthesis. The alphabet A represents a certain condition in the side the flask [5]



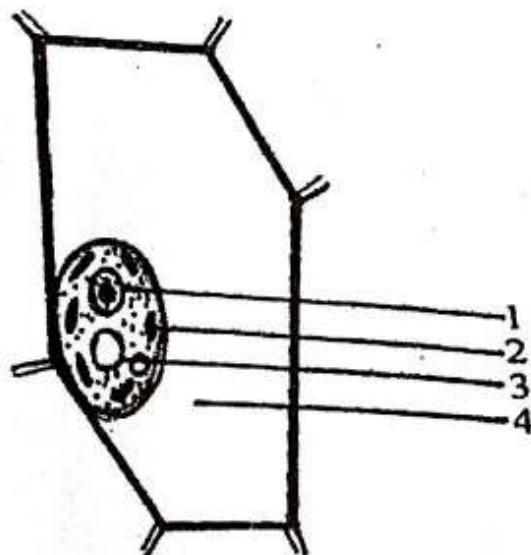
- (i) What is the aim of the experiment?
- (ii) Identify the special condition in the flask
- (iii) Name an alternative chemical that can be used instead of KOH
- (iv) In what manner do the leaves 1 and 2 differ at the end of the starch test?
- (v) Write a well-balanced equation to represent the process of photosynthesis
- (vi) Draw a neat labelled diagram of chloroplast

Question 6.

- (a) The diagram given below represents human heart in one phase of its functional activities. Study the same and answer the questions that follow: [5]



- (i) Name the Phase
(ii) Label the parts 1, 2 & 3
(iii) Which part of the heart is contracting in this phase? Give a reason to support your answer.
(iv) Draw a labelled diagram of part 1 and 2 to show the structural differences between them
- (b) Given below is the diagram of a cell as seen under the microscope after having been placed in a solution. [5]



- (i) What is the technical term used for the state/condition of the cell given above?
(ii) Give the technical term for the solution in which the cell was placed.
(iii) Name the parts numbered 1 to 4.
(iv) Is the cell given above a plant cell or an animal cell? Give two reasons in support of your answer as evident from the diagram.
(v) What would you do to bring the cell back to its original condition?
(vi) Draw a neat diagram of root hair cell as it would appear when a concentrated solution of fertilizers are added to it.

Question 7

[5]

(a) State the main functions of the following

- (i) Centrosome
- (ii) Chordae tendinae
- (iii) Eustachian tube
- (iv) Vitreous humour.
- (v) Tears

[5]

(b) Explain the following biological terms

- (i) Vasectomy
- (ii) Osmoregulation
- (iii) Ozone layer depletion
- (iv) Mutation
- (v) Homologous chromosome