



STD: X  
(2 hours)

DATE: 11.01.19  
Marks: 80

**BIOLOGY**  
**SCIENCE PAPER 3**

(Two Hours)

*Answers to this paper must be written on the paper provided 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 A and any four from Section B.*

*The intended marks for questions or parts of a question are given in the brackets [ ]*

**SECTION - A [Marks 40]**

(Attempt all questions from this Section.)

**Question 1**

(a) Give the equivalent term for the following.-

[5]

- (i) Name the hormone which promotes movement of calcium ions from blood to bones.
- (ii) The tubular knot fitting like a cap on the upper side of the testes.
- (iii) A part of large intestine projects from the blind end of the caecum as a narrow worm like tube.
- (iv) The structure responsible to transmit characteristics from parent to offspring.
- (v) The process by which leucocytes engulf and destroy bacteria.

(b) Choose the correct answer from each of the four options given below:-

[5]

- (i) The photosensitive pigment present in the rod cells in the retina.  
(a) Melanin (b) Rhodospin (c) Iodospin (d) Podospin
- (ii) Which of the following is the Phenotypic monohybrid ratio in  $F_2$  generation.  
(a) 3:1 (b) 1:2:1  
(c) 2:2 (d) 1:3
- (iii) Receptors for heat and cold in the skin, due to change in temperature.  
(a) phonoreceptors (b) Thermoreceptors  
(c) photoreceptors (d) chemoreceptors.
- (iv) The recessive gene is one that expresses itself in.  
(a) Heterozygous condition (b) Homozygous condition  
(c)  $F_2$  generation (d) Y-linked inheritance
- (v) Which one of the following is mainly associated with the maintenance of the posture.  
(a) cerebrum (b) cerebellum (c) thalamus (d) pons

(c) Rewrite and complete the following sentences by inserting the correct word in the space indicated: [5]

- (i) \_\_\_\_\_ is the phenomenon of contraction of the protoplasm from the cell wall.
- (ii) Wooden doors swell up in rainy seasons due to \_\_\_\_\_.
- (iii) The blood vessels that begins and ends in capillaries is the \_\_\_\_\_.
- (iv) \_\_\_\_\_ is the scientific name of the garden pea, which Mendel used for his experiments.
- (v) A fluid that occupies the larger cavity of the eye ball behind the lens is \_\_\_\_\_.

(d) State the exact location:- [5]

- (i) Seminal vesicle      (ii) Incus      (iii) Corpus Callosum
- (iv) Amnion      (v) Pulmonary semilunar valve.

(e) State the main function of the following :- [5]

- (i) Cerebrospinal fluid      (ii) Eustachian tube      (iii) Suspensory ligament of the eye
- (iv) Sperm duct      (v) Hypothalamus.

(f) Given below are six sets with four terms each. In each set one term is odd and cannot be grouped in the same category to which the other three belong. Identify the odd one in each set and name the category to which the remaining three belong. The first one has been done as an example. [5]

Example: Calyx, Corolla, Stamens, Midrib

Odd term: Midrib

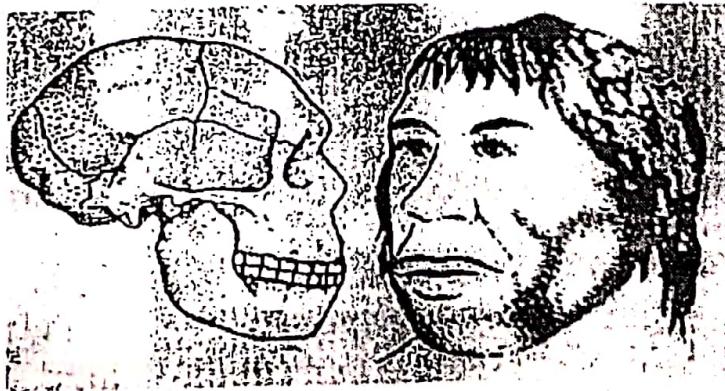
Category: parts of a flower.

- (i) Haemophilia, Colour blindness, Albinism, Night blindness.
- (ii) Urethra, Ureter, Urinary bladder, Uterus.
- (iii) Dendrites, Medullary sheath, Photon, Axon.
- (iv) Oxytocin, Insulin, Prolactin, Progesterone.
- (v) Haemoglobin, Glucagon, Iodospin, Rhodospin.

(g) What is meant by plant hormone? Give one example each of the plant hormone that: [5]

- (i) Induce formation of Parthenocarpic fruit \_\_\_\_\_.
- (ii) Promote the growth of internodes by cell elongation \_\_\_\_\_.
- (iii) Increase the tolerance of plants to various kinds of stresses \_\_\_\_\_.
- (iv) Inhibit apical dominance \_\_\_\_\_.

(h) Study the diagram given and answer the questions that follows:- [5]



- (i) Name the stage of human ancestor shown in the given figure.
- (ii) Differentiate between the human ancestor shown and Homo sapiens on the basis of the following  
(A) Locomotion (B) Head and forehead (C) Brow ridges.
- (iii) Write two features of the Pre- human ancestor.

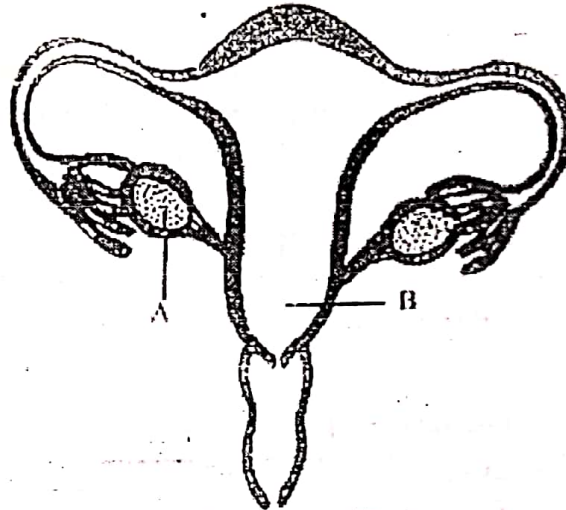
**SECTION – B [Marks 40]**

(Attempt any four questions from this Section)

**Question 2**

(a) Study the diagram given below and then answer the question that follow:-

[5]

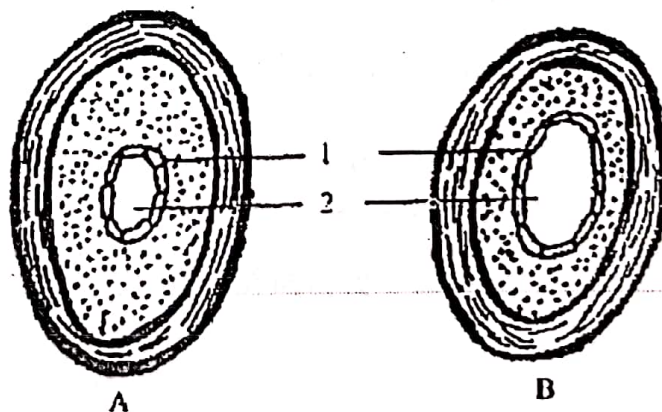


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- (i) Name the part labelled A. Name any two hormones produced by the part labelled A.
- (ii) What happened to the part labelled B –  
(1) If fertilization takes place?  
(2) If fertilization does not take place?
- (iii) Where does fertilization occur?
- (iv) Draw a neat diagram of the human sperm as seen under high magnification and label the following parts.  
(1) Acrosome (2) Mitochondria

(b) The diagram given below show the cross section of two kinds of blood vessels:  
Image:-

[5]



- (i) Identified the blood vessels A and B. In each case give a reason to support your answer.
- (ii) Name the parts numbered 1 and 2.
- (ii) When are sounds "LUB" and "DUB" produced during a heartbeat?
- (iv) Write any two functions of the spleen.

**Question 3**

(a) Give the biological / technical terms of the following:

[5]

- (i) Fixing of the developing zygote on the uterine wall.
- (ii) The permanent stoppage of menstruation at about the age of 45 years in a female.
- (iii) The hormone increasing reabsorption of water by kidney tubules.
- (iv) A thin membrane covering the entire front part of the eye.
- (v) The lens of eye losing flexibility resulting in a kind of long-sightedness in the middle aged people.
- (vi) Plasma devoid of fibrinogen.
- (vii) Alternative form of a gene on a pair of homologous chromosome.
- (viii) Period of complete intrauterine development of the foetus.
- (ix) The stage where daughter chromosomes move to opposite poles of the spindle.
- (x) Movement of molecules across the cell membrane from hypertonic to hypotonic using energy.

(b) Study the given figure and answer the following questions:-

[5]

Image:-



- (i) What does the figure depict?
- (ii) Write three sources of the figure.
- (iii) Mention two measures to control the above.
- (iv) Name the sources of radiation.

**Question 4**

(a)

[5]

- (i) What are the age restrictions for marriage by law for boys and girls in India?
- (ii) Name two surgical techniques (one for the human male and another for the human female) that can be used for prevent pregnancy. Explain in brief.
- (iii) Write three factors responsible for population explosion in India.

(b) Complete the following table by filling the blanks 1 to 10 with appropriate terms.

[5]

Gland	Secretion	Function / Effect on Body
1	Testosterone	2
Adrenal	3	4
5	6	Influences metabolism of cells
Lacrimal	7	8
9	10	Gigantism

### Question 5

(a) Give reason for the following:

[5]

- Bending of shoot towards the source of light.
- Injury to the medulla oblongata results in death.
- For sexual reproduction gametes must be produced with haploid chromosomes.
- Oxytocin hormone is administered into pregnant women.
- Rate of photosynthesis is low at high temperature.

(b)

[5]

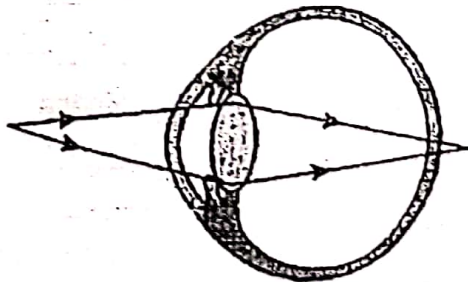
- Draw a neat labelled diagram to show the metaphase stage of mitosis in an animal cells having four chromosomes.
- How many daughter cells are found at the end of mitosis and at the end of meiosis?
- With Reference to cell division explain the terms,  
1. Centromere 2. Haploid
- Name the type of cell division that occurs during  
(a) formation of pollen grains (b) Repair of worn out tissues

### Question 6

(a) Differentiate between the following pairs on the basis of what is mentioned within brackets:- [5]

- Natality and mortality (definition)
- Transpiration and Guttation (Structure involved)
- Acromegaly and Cretinism (symptoms)
- Phototropism and Thigmotropism (define)
- Simple goitre and Exophthalmic goitre (symptoms)

(b) Study the following diagram carefully and then answer the questions that follow. The diagram is depicting a defect of the human eye: [5]

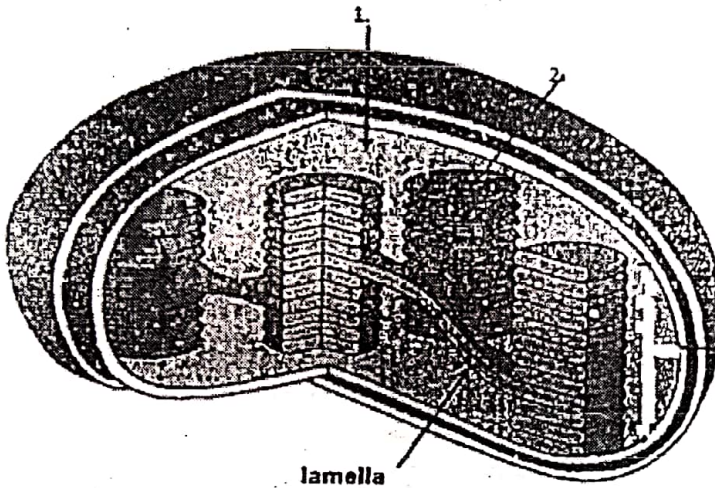


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- (i) Identify the defect shown in the diagram.
- (ii) Give two possible reasons for the above defect.
- (iii) Draw a neat labelled diagram to show how the above defect can be rectified.

**Question 7**

- (a) The given diagram is a diagrammatic representation of the internal structure of an organelle found in a plant cell. Study the same and then answer the questions that follow: [5]
- Images:-



- (i) Identify the organelle.
- (ii) Name the physiological process occurring in this organelle.
- (iii) Mention one way in which this process is beneficial to man.
- (iv) Name the phases of the process occurring in the part labelled '1' and '2'.
- (v) A chemical substance 'NADP' plays an active part in one of the phases. Give the expanded form of NADP and state its role in above process.
- (vi) Represent the physiological process mentioned in (ii) above in the form of a chemical equation.

- (b) (i) Explain the Lamarck's theory of inheritance of acquired characters. [5]
- (ii) What are vestigial organs? Give two examples of vestigial organs in humans.
- (iii) Give scientific name of the peppered moth.

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