KARNATAKA ICSE SCHOOLS ASSOCIATION

ICSE STD. X Preparatory Examination 2025

Subject – BIOLOGY

Duration : 2 Hrs **Maximum Marks : 80** **Date: 21.01.2025**

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

*You will not be allowed to write during 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 answer.

Section A is compulsory.** Attempt **any four** questions from **Section B.

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

SECTION A

*(Attempt **all** questions from this section.)*

Question 1

Choose the correct answers to the questions from the given options. [15]

(Do not copy the question, write the correct answers only.)

(i) A horticulturist wants to make an ornamental plant bushier. Which hormone can he apply to the plant to enhance lateral shoot growth?

(a) Auxins

(b) Gibberellins

(c) Cytokinins

(d) Ethylene

(ii) The plant organelle that contains its own DNA:

(a) Mitochondria and chloroplast

(b) Golgi bodies and mitochondria

(c) Endoplasmic reticulum and golgi bodies

(d) Golgi bodies and chloroplast

(iii) **Assertion (A):** Ultrafiltration in glomerulus is a process driven by high hydrostatic pressure.

Reason (R): Afferent arteriole has a wider diameter than efferent arteriole.

(a) Both A and R are True

(b) Both A and R are False

(c) A is True and R is False

(d) A is False and R is True

(iv) Pragya experiences vision problems due to insufficient blood flow to the retina, reducing nutrient supply to it. Which part of the eye is impaired in this condition?

(a) Optic nerve

(b) Cornea

(c) Sclera

(d) Choroid

(v) In humans, gestation period is vital for the complete development of the foetus. The average gestation period in humans is:

(a) 180 days

(b) 190 days

(c) 280 days

(d) 290 days

(vi) Which of the following is a non-biodegradable pollutant?

(a) Paper

(b) Plastics

(c) Vegetable waste

(d) Animal remains

(vii) **Assertion (A):** Imbibition is the phenomenon responsible for the swelling of wooden doors during rainy season.

Reason (R): Imbibition involves absorption of water by hydrophobic substances like cellulose in the wood.

(a) Both A and R are True

(b) Both A and R are False

(c) A is True and R is False

(d) A is False and R is True

(viii) The liver breaks down old red blood cells and produces a substance known as:

(a) Glucagon

(b) Insulin

(c) Bilirubin

(d) Glycogen

(ix) A Lab technician notices that a patient's urine is darker than usual. The pigment likely to be responsible for this increase in colour is:

(a) Melanin

(b) Haemoglobin

(c) Creatinine

(d) Urochrome

(x) Ritesh was performing an experiment on transpiration. He placed a strip of paper on the lower surface of a leaf, which changed from blue to pink. The indicator of moisture that he used in the experiment was:

(a) Filter paper

(b) Blotting paper

(c) Litmus paper

(d) Cobalt chloride paper

(xi) The term 'heterozygous' refers to:

(a) Two identical alleles for a gene

(b) Two different alleles for a gene

(c) A dominant allele

(d) A recessive allele

(xii) **Assertion (A):** Adrenaline is released during stress to prepare the body for a 'fight or flight' response.

Reason (R): During stress, adrenaline decreases blood glucose levels by stimulating the breakdown of glycogen in liver.

(a) Both A and R are True

(b) Both A and R are False

(c) A is True and R is False

(d) A is False and R is True

(xiii) Arrange the following steps in the correct sequence as they occur during photosynthesis.

1. Photophosphorylation generates ATP
2. A photon excites chlorophyll molecules in the photosystem
3. Photolysis of water occurs, releasing hydrogen and hydroxyl ion
4. Glucose is synthesized during biosynthetic phase

(a) 4, 2, 3, 1

(b) 3, 2, 1, 4

(c) 2, 3, 1, 4

(d) 1, 3, 2, 4

(xiv) **Assertion (A):** Acid rain can damage buildings and monuments made of limestone and marble.

Reason (R): The acids in acid rain react with calcium carbonate in limestone and marble, leading to the erosion of the monuments.

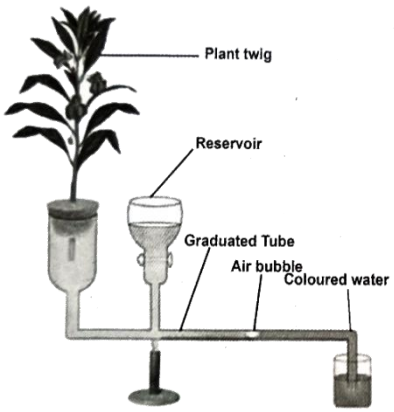
(a) Both A and R are True

(b) Both A and R are False

(c) A is True and R is False

(d) A is False and R is True

(xv) Riya sets up a Ganong's potometer to measure the rate of transpiration in a plant. She tests the plant under different conditions. What would be her observation?



(a) The air bubble moves quickly towards the twig when the apparatus is placed in humid conditions.

(b) The air bubble moves very quickly towards the twig when the apparatus is placed in complete darkness.

(c) The air bubble moves very quickly towards the twig when the apparatus is placed in bright light with a fan blowing air across the leaves.

(d) The air bubble does not move towards the twig when the apparatus is placed in bright light with a fan blowing air across the leaves.

Question 2

(i) Name the following: [5]

(a) The vitamin necessary for the production of prothrombin.

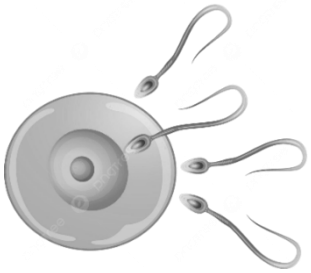
(b) Point of contact between homologous chromosomes during the exchange of genes during meiosis.

(c) Condition characterised by the development of male features in females, caused by the overgrowth of adrenal cortex.

(d) Metallic element present in the chlorophyll molecule that facilitates photosynthetic activities.

(e) Part of the human ear that plays a key role in maintaining static balance.

(ii) Given below is the diagrammatic representation of fertilization in human body.
Read the information below the diagram and fill in the blanks: [5]



Fertilization in humans is the process where male gametes fuses with the female gametes to form a single cell called the zygote. The resulting zygote contains a complete set of 46 chromosomes, half of which comes from the father and the other half from the mother. This process is essential for sexual reproduction, as it combines genetic material from both the parents, giving rise to a genetically distinct individual.

During fertilization many sperm reach the egg, but only one fuses with the egg. The successful sperm releases an enzyme called hyaluronidase from its (a) _____ to dissolve the egg's outer layer. This process occurs in the (b) _____ of the female reproductive system. The resulting zygote undergoes repeated cell division to form a hollow ball of cells called (c) _____ which travels to the (d) _____ and fixes itself into its lining during a process called (e) _____.

(iii) Arrange and rewrite in each group in the correct order so as to be in a logical sequence beginning with the term that is **underlined.** [5]

(a) Chromatin fibres, Nucleosome, Genes, DNA.

(b) Anterior vena cava, Lymph vessels, Right auricle, Lymph.

(c) Hypothalamus, Cortisone, Adrenal cortex, Anterior Pituitary Gland.

(d) Central nervous system, Stimulus, Effector, Motor neuron.

(e) Xylem of the leaf, Substomatal space, Water, Stomata.

(iv) Read the explanations given below and name the structure**:** [5]

Example: The largest gland in the human body that secretes bile.

Answer: Liver.

(a) Organ of hearing found within the cochlea that contains sensory cells.

(b) Openings in the leaf epidermis, located at the margins of the leaves, which are involved in the process of guttation.

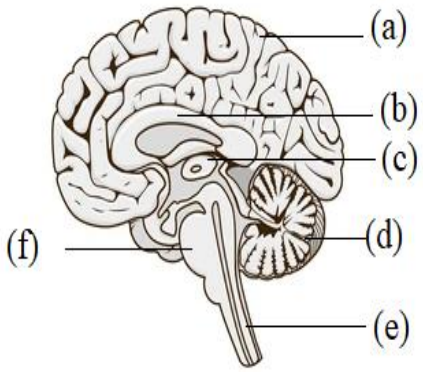
(c) Extensions of outer epidermal cells of the root.

(d) Type of leucocytes, characterised by a large, kidney shaped nucleus that plays a role in phagocytosis.

(e) Hollow muscular organ in the pelvic region that temporarily stores urine before it is excreted from the body.

(v) Given below is a cross section of the human brain**.** Match the structures marked (a) to (e) with their correct functions: [5]

Example: (f) – 6. Carries impulses from one hemisphere of the cerebellum to the other

Cross Section of Human Ear	**Functions**
	1. Relays pain and pressure impulses to cerebrum
	2. Coordinates muscular activity and maintains body balance
	3. Controls involuntary activities
	4. Transfer information from one cerebral hemisphere to the other
	5. Seat of intelligence and will power
	6. Carries impulses from one hemisphere of the cerebellum to the other

SECTION B

(*Attempt **any four** questions from this Section.*)

Question 3

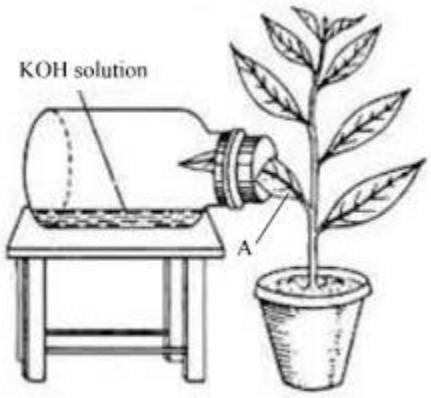
(i) State Mendel's Law of Dominance. [1]

(ii) Name the phenomenon that explains the increase in dark-coloured peppered moths during the Industrial Revolution. Give the scientific name of the peppered moth that was involved in this phenomenon. [2]

(iii) What are neurotransmitters? Give an example. [2]

(iv) During a routine inspection at a nuclear power plant, a technician discovers that a radioactive isotope has leaked into a nearby river. This is found to accumulate in the endocrine gland which is responsible for regulating metabolic activities in the human body. Mention the radioactive isotope and the endocrine gland. [2]

(v) A group of students is conducting an experiment to investigate how different factors affect the rate of photosynthesis in a plant. [3]



(a) Identify the factor being investigated.

(b) What is the reason for using potassium hydroxide in the experiment?

(c) What did the students observe when the leaf A was tested for starch?

Question 4

(i) Why do unripe bananas ripen when stored with ripe oranges? [1]

(ii) Differentiate between population density and natality. [2]

(iii) What would be the possible colour vision traits of the offsprings resulting from a marriage between a colourblind father and a mother with normal vision? [2]

(iv) A team of anthropologists has discovered a set of fossilised remains in a remote area. The team is trying to identify which early human ancestor these characteristics might belong to. Based on the characteristics, identify the human ancestors. [2]

(a) Cranial capacity ranging between 450 – 600 cm^3, prognathous face and lack of chin.

(b) Cranial capacity ranging between 1450 – 1600 cm^3, orthognathous face and well developed chin.

(v) Draw a neat, labelled diagram of stomatal apparatus. [3]

Question 5

(i) Why is blood group 'O' referred to as the universal donor? [1]

(ii) Write two functions of centromere. [2]

(iii) What are the factors contributing to the population growth in India? [2]

(iv) Sanjesh was walking in a forest when he suddenly encountered a wild animal. How did the activation of his sympathetic nervous system affect his pupils and blood vessels in this high stress situation? [2]

(v) Rhea is finding it difficult to read her Physics textbook. Answer the following questions: [3]

(a) What condition is Rhea likely to be suffering from?

(b) What could be the possible cause of this condition?

(c) How can this condition be corrected?

Question 6

(i) Why is blind spot considered as an area of no vision? [1]

(ii) What is the natural pacemaker of the human body? Where is it located? [2]

(iii) In what ways does the amnion support the foetus during pregnancy? [2]

(iv) In the process of pickling vegetables, how does salt help preserve the food and prevent spoilage? [2]

(v) The image shows two individuals with extreme differences in height. This condition is caused due to a hormone secreted by an endocrine gland. [3]

(a) Where is this gland located?

(b) Define tropic hormones.

(c) A couple struggling with infertility was advised to check the hormone secreted by this gland, that plays a key role in gametogenesis. Name the hormone.

Question 7

(i) Why do plants droop or wilt in the afternoon? [1]

(ii) What is the role of prostate gland and seminal vesicles in male reproductive system? [2]

(iii) During which stage of mitosis do the following events occur? [2]

(a) Chromosomes condense and become visible inside the nucleus.

(b) The mitotic spindle forms and chromosomes align themselves along the cell's equatorial plane.

(iv) What are the key functions of distal convoluted tubule in the process of formation of urine? [2]

(v) Draw a neat, labelled diagram of a cross section of the blood vessel that transports blood towards the heart. [3]

Question 8

(i) What is cytokinesis? [1]

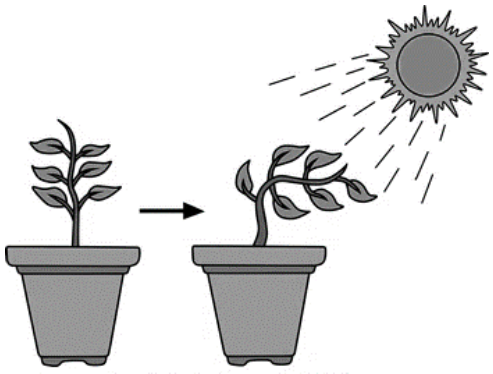
(ii) Given below are two statements which are incorrect. Rewrite the correct statements. [2]

(a) Depletion of ozone layer is caused by increased levels of carbon monoxide in the atmosphere.

(b) Vasopressin causes contraction of uterus during childbirth.

(iii) What is the phenotypic ratio in F_2 generation of a Monohybrid Cross and a Dihybrid cross? [2]

(iv) Plants exhibit the ability to grow towards light, a process that helps them optimise photosynthesis. This movement is not random but is controlled by a specific biological mechanism that involves the distribution of plant hormones. [2]



(a) Define the phenomenon demonstrated in the picture?

(b) How does the hormone auxin contribute to this process?

(v) Draw a neat, labelled diagram of a neuron. [3]

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