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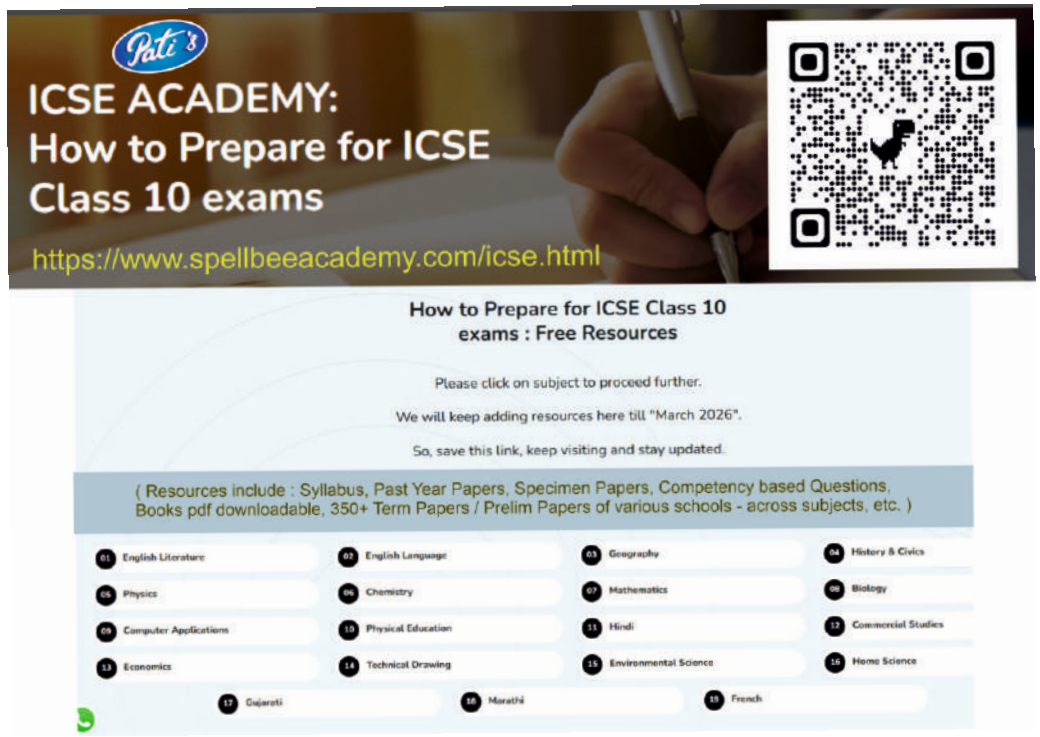

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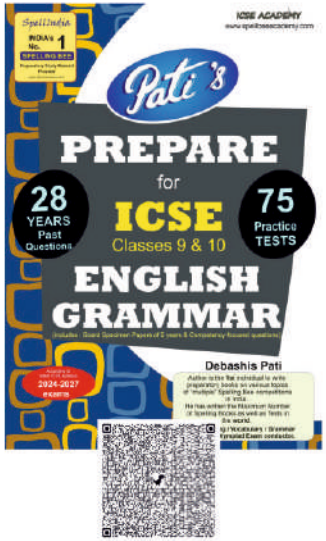

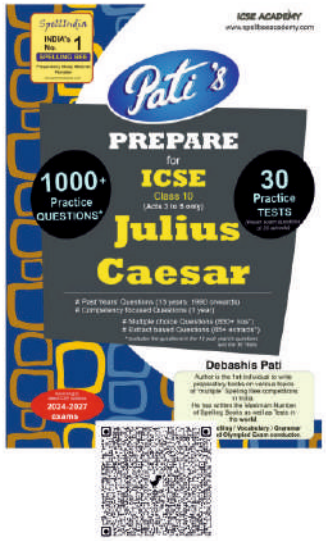

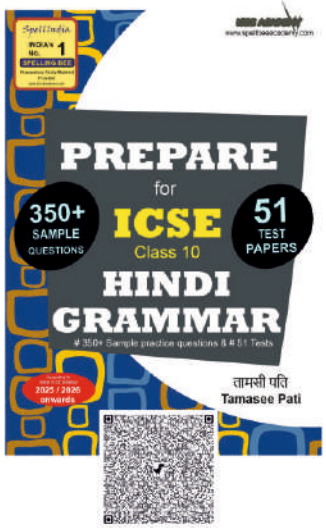

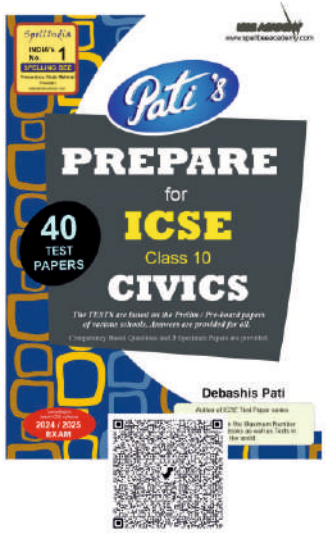

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Note : There was no board exam in 2021 and 2022 due to COVID.

ICSE Board
Class X Biology
Board Paper 2024
(Two hours)

General Instructions: **Total Marks: 80**

1. Answers to this paper must be written on the paper provided separately.
*2. You will **not** be allowed to write during the first **15** minutes.*
This time is to be spent in reading the question paper.
3. The time given at the head of the paper is the time allowed for writing the answers.
*4. Attempt **all** questions from **Section I** and **any four** questions from **Section II**.*
5. The intended marks of questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)

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

Question 1

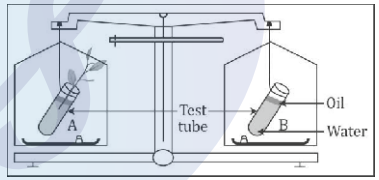
(a) Name the following:
(i) The part of the brain associated with memory.
(ii) The ear ossicle which is attached to the tympanum.
(iii) The type of gene which is not expressed in the presence of a contrasting allele.
(iv) The hormone secreted by islets of langerhans.
(v) The process of conversion of ADP into ATP during photosynthesis. [5]

(b) State the main function of the following:
(i) Cerebrospinal fluid
(ii) Eustachian tube
(iii) Suspensory ligament of the eye
(iv) Sperm duct
(v) Lenticels [5]

(c) Copy and complete the following by filling in the blanks 1 to 5 with appropriate words:
The human female gonads are ovaries. A maturing egg in the ovary is present in a sac of cells called _____(1). As the egg grows larger, the follicle enlarges and gets filled with a fluid and is now called the _____(2) follicle. The process of releasing the egg from the ovary is called _____(3). The ovum is picked up by the oviducal funnel and fertilisation takes place in the _____(4). In about a week, the blastocyst gets fixed in the endometrium of the uterus and this process is called _____(5). [5]

(d) 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.
Example: Calyx, Corolla, Stamens, Midrib
Odd term: midrib
Category: Parts of a flower
(i) Haemoglobin, Glucagon, Iodopsin, Rhodopsin
(ii) Urethra, Uterus, Urinary bladder, Ureter
(iii) Transpiration, Photosynthesis, Phagocytosis, Guttation
(iv) Cyton, Photon, Axon, Dendron
(v) Oxytocin, Insulin, Prolactin, Progesterone [5]

(e) The figure given below represents an experimental setup with a weighing machine to demonstrate a particular process in plants. The experimental setup was placed in bright sunlight. Study the diagram and answer the following questions:



(i) Name the process intended for study.
(ii) Define the above mentioned process.
(iii) When the weight of the test tube (A & B) is taken before and after the experiment, what is observed? Give reasons to justify your observation in A & B.
(iv) What is the purpose of keeping the test tube B in the experimental setup? [5]

(f) Match the items given in Column A with the most appropriate ones in Column B and rewrite the correct matching pairs from Column A and Column B: [5]

Sr. No.	Column A	Column B	
1	Pituitary gland	a.	Testosterone
2	Sulphur dioxide	b.	Calcium
3	Seminiferous tubules	c.	Growth hormone
4	Clotting of blood	d.	Acid rain
5	Guttation	e.	Sperms
		f.	Global warming
		g.	Magnesium
		h.	Hydathodes

(g) Choose the correct answer from the options given below:

(i) Cretinism and Myxoedema are due to
- A. Hypersecretion of thyroxin
- B. Hypersecretion of growth hormone
- C. Hyposecretion of thyroxin
- D. Hyposecretion of growth hormone

(ii) Which of the following is not a natural reflex action?
- A. Knee-jerk
- B. Blinking of eyes due to strong light
- C. Salivation at the sight of food
- D. Sneezing when any irritant enters the nose

(iii) After mitotic cell division, a female human cell will have
- A. XX chromosomes
- B. XY chromosomes
- C. X chromosomes
- D. Y chromosomes

(iv) The antibiotic penicillin is obtained from
- A. Protozoan
- B. Bacteria
- C. Virus
- D. Fungus

(v) The site of maturation of human sperms is the
- A. Seminiferous tubule
- B. Interstitial cells
- C. Epididymis
- D. Prostate gland [5]

(h) State the exact location of the following:

(i) Tricuspid valve
(ii) Amnion
(iii) Yellow spot
(iv) Seminal vesicle
(v) Adrenal gland [5]

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SECTION II [40 Marks]

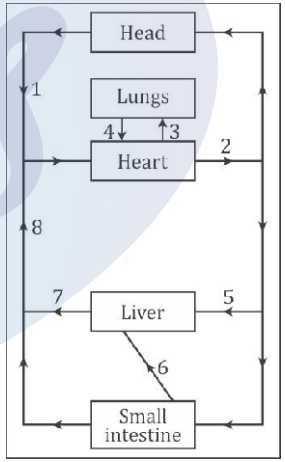
*Attempt any **four** questions from this section.*

Question 2

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

(i) Spinal nerves and Cranial nerves (number of nerves)
(ii) Near vision and Distant vision (shape of the eye lens)
(iii) Corpus callosum and Corpus luteum (function)
(iv) Turgor pressure and Wall pressure (explain)
(v) Disinfectant and Antiseptic (definition) [5]

(b) The diagram below represents the simplified pathway of the circulation of blood. Study the same and answer the questions which follow:



(i) Name the blood vessels labelled 1 and 2
(ii) State the function of blood vessels labelled 5 and 8
(iii) What is the importance of the blood vessel labelled 6
(iv) Which blood vessel will contain a high amount of glucose and amino acids after a meal?
(v) Draw a diagram of the different blood cells as seen in a smear of human blood. [5]

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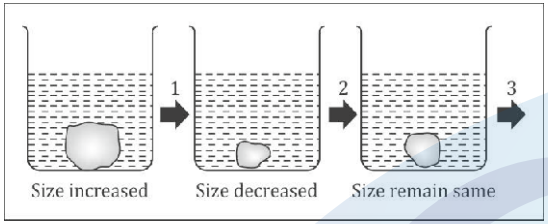
Question 3

(a) A candidate in order to study the process of osmosis has taken 3 potato cubes and put them in 3 different beakers containing 3 different solutions. After 24 hours, in the first beaker the potato cube increased in size, in the second beaker the potato cube decreased in size and in the third beaker there was no change in the size of the potato cube. The following diagram shows the result of the same experiment:



(i) Give the technical terms of the solutions used in beakers 1, 2 and 3
(ii) In beaker 3 the size of the potato cube remains the same. Explain the reason in brief.
(iii) Write the specific feature of the cell sap of root hairs which helps in absorption of water.
(iv) What is osmosis?
(v) How does a cell wall and a cell membrane differ in their permeability? [5]

(b) A potted plant was taken in order to prove a factor necessary for photosynthesis. The potted plant was kept in the dark for 24 hours. One of the leaves was covered with black paper in the centre. The potted plant was then placed in sunlight for a few hours.
(i) What aspect of photosynthesis was being tested?
(ii) Why was the plant placed in the dark before beginning the experiment?
(iii) During the starch test, why was the leaf
(1) boiled in water
(2) boiled in methylated spirit
(iv) Write a balanced chemical equation to represent the process of photosynthesis.
(v) Draw a neat diagram of a chloroplast and label its parts. [5]

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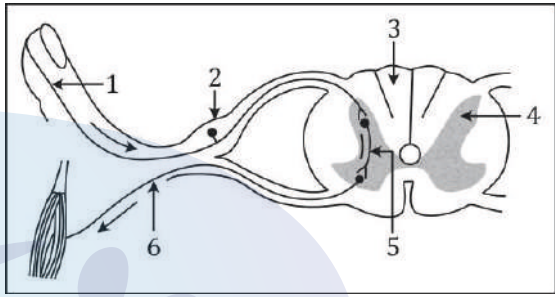
Question 4

(a) The diagram given below is a representation of a certain phenomenon pertaining to the nervous system. Study the diagram and answer the following questions:



(i) Name the phenomenon which is being depicted.
(ii) Give the technical term for the point of contact between the two nerve cells.
(iii) Name the parts 1, 2, 3 and 4
(iv) Write the functions of parts 5 and 6
(v) How does the arrangement of neurons in the spinal cord differ from that of the brain? [5]

(b) Give scientific reasons for the following statements:
(i) Use of CFC is banned in many countries.
(ii) We cannot distinguish colours in moonlight.
(iii) Balsam plants wilt during mid-day even if the soil is well watered.
(iv) Carbon monoxide is highly dangerous when inhaled.
(v) A person walks clumsily after consuming alcohol. [5]

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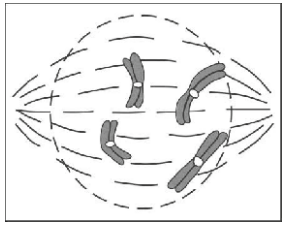
Question 5

(a) Given below is a diagram representing a stage during mitotic cell division. Study it carefully and answer the questions which follow:



(i) Is it a plant cell or an animal cell? Give a reason to support your answer.
(ii) Identify the stage shown.
(iii) Name the stage which follows the one shown here. How is that stage identified?
(iv) How will you differentiate between mitosis and meiosis on the basis of the chromosome number in the daughter cells?
(v) Draw a duplicated chromosome and label its parts. [5]

(b)

(i) Name the disease for which the following types of vaccines are given:
(1) BCG vaccine
(2)
(ii) Give one example of each of the following:
(1) A water pollutant
(2) An aquatic plant used in the laboratory to demonstrate O_2 liberation during photosynthesis
(3) An antibiotic
(4) A nitrogenous base in DNA
(iii) Expand the following biological abbreviations:
(1) ATP
(2) TSH
(3) DPT
(4) DNA [5]

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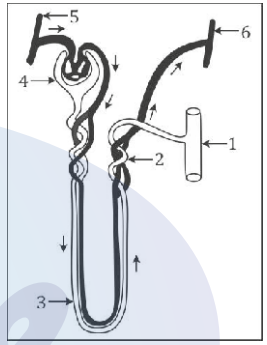
Question 6

(a) The given diagram represents a nephron and its blood supply. Study the diagram and answer the following questions:



(i) Label parts 1, 2, 3 and 4
(ii) State the reason for the high hydrostatic pressure in the glomerulus.
(iii) Name the blood vessel which contains the least amount of urea in this diagram.
(iv) Name the two main stages of urine formation.
(v) Name the part of the nephron which lies in the renal medulla. [5]

(b) Briefly explain the following terms.
(i) Monohybrid cross
(ii) Biomedical waste
(iii) Innate immunity
(iv) Diapedesis
(v) Hormones [5]

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Question 7

(a)

(i) State any two harmful effects of noise pollution on human health.

(ii) Categorise the following activities according to the functions of the Red Cross Society and the WHO:

(1) To suggest quarantine measures to prevent spread of disease

(2) Humanitarian services to victims of war

(3) To educate people in accident prevention

(4) To promote projects for research on disease

(iii) Write any two major reasons for the population explosion in India.

(iv) [5]

(b) Give technical terms for the following:

(i) A method of contraception in which the sperm duct is cut and ligated

(ii) Statistical study of human population

(iii) The protective covering of the heart

(iv) A sudden heritable change in the gene

(v) Repeated units of DNA molecule

(vi) The fluid portion of blood

(vii) The nerve which transmits impulses from the ear to the brain

(viii) Group of hormones which influence other endocrine glands to produce hormones

(ix) Thin walled sac of skin which covers the testes

(x) The permanent stoppage of the menstrual cycle in a woman aged 8 years [5]

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ICSE Board
Class X Biology
Board Paper 2015
(Two hours)

General Instructions: **Total Marks: 80**

1. Answers to this paper must be written on the paper provided separately.
*2. You will not be allowed to write during the first **15** minutes.*
This time is to be spent in reading the question paper.
3. The time given at the head of the paper is the time allowed for writing the answers.
*4. Attempt **all** questions from **Section I** and **any four** questions from **Section II**.*
5. The intended marks of questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Question 1

(a) Name the following:

(i) The process of uptake of mineral ions against the concentration gradient using energy from cell.

(ii) The form in which glucose in stored in liver.

(iii) The vein that carries oxygenated blood.

(iv) The cross between two parents having one pair of contrasting characters.

(v) The structure formed by the villi of the embryo and the uterus of the mother. [5]

(b) The statements given below are false. Rewrite the correct form of the statement by changing the word which is underlined:

(i) Alpha cells of pancreas secrete Insulin.

(ii) Formalin is an example of an Antiseptic.

(iii) CNG is mainly responsible for the formation of acid rain.

(iv) Sulphadiazine is an example of an Antiseptic.

(v) Cretinism is caused due to deficiency of Adrenaline. [5]

(c) Choose the correct answer from the four options given below:

(i) A single highly coiled tube where sperms are stored, gets concentrated and mature us known as:

A. Epididymis
B. Vas efferentia
C. Vas deferens
D. Seminiferous tubule

(ii) Chromosomes get aligned at the centre of the cell during:
A. Metaphase
B. Anaphase
C. Prophase
D. Telophase

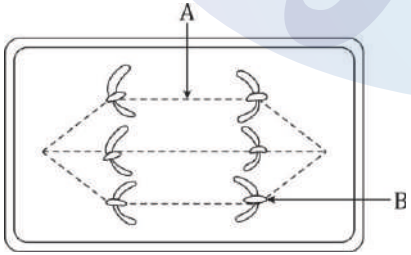
(iii) BCG vaccine is effective against
A. Cholera
B. Mumps
C. Tuberculosis
D. Measles

(iv) Which one of the following associated with the maintenance of the posture?
A. Cerebrum
B. Cerebellum
C. Thalamus
D. Pons

(v) An example of non-biodegradable waste is
A. Vegetable peels
B. Sewage
C. Livestock waste
D. DDT [5]

(d) Mention the exact location of the following structures:
(i) Thylakoids
(ii) Organ of Corti
(iii) Lenticels
(iv) Bicuspid value
(v) Loop of Henle [5]

(e) The diagram given below represents a certain stage of mitosis:



(i) Identify the stage of cell division.
(ii) Name the parts labelled A and B
(iii) What is the unique feature observed in this stage?
(iv) How many daughter cells are formed from this type of cell division? [5]

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(f) Given below is an example of a certain structure and its special functional activity. On a similar pattern fill in the blanks with suitable functions:
Example: Chloroplast and photosynthesis
(i) Xylem and _____.
(ii) Ciliary body and _____.
(iii) Seminiferous Tubule and _____.
(iv) Thyroid gland and _____.
(v) Eustachian Tube and _____. [5]

(g) Rewrite and complete the following sentences by inserting the correct word in the space indicated:
(i) The phenomenon of loss of water through a cut stem or injured part of plant is called _____.
(ii) _____ is the scientific name of garden pea, which Mendel used for his experiments.
(iii) A fluid that occupies the larger cavity of the eye ball behind the lens is _____.
(iv) Oxygen combines with haemoglobin present in RBC and forms _____.
(v) _____ causes corrosion of the marble or brick surface. [5]

(h) Match the items in Column
Rewrite the matching pairs as shown in the example: [5]
Example: Fibrinogen . Clotting of blood.

Column A	Column B
(1) Allele	(a) Control of automobile exhaust
(2) Leydig cells	(b) Tourniquet
(3) Utriculus	(c) Alternate forms of genes
(4) Snake bite	(d) Dynamic equilibrium
(5) Euro IV norms	(e) Testosterone
	(f) Sudden change in genes
	(g) Static equilibrium

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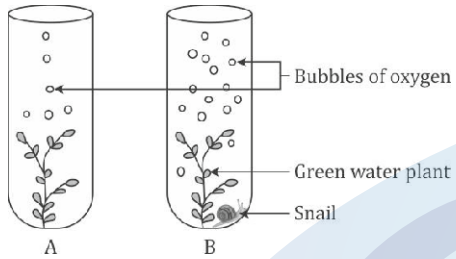
SECTION II (40 Marks)

Attempt any four questions from this Section

Question 2

(a) The diagram below shows two test-tubes A and B. Test-tube A contains a green water plant. Test-tube B contains both a green water plant and a snail. Both test-tubes are kept in sunlight. Answer the questions that follow:

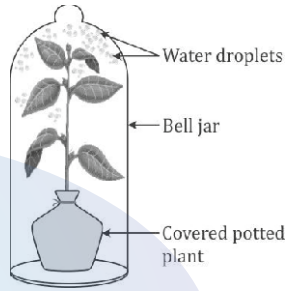


(i) Name the physiological process that releases the bubbles of oxygen.
(ii) Explain the physiological process as mentioned above in Q.2(a)(i).
(iii) What is the purpose of keeping a snail in test-
(iv) Why does test- have more bubbles of oxygen?
(v) Given an example of a water plant that can be used in the above process.
(vi) Write the overall chemical equation for the above process. [5]

(b) Give the biological/technical terms for the following:
(i) A mixture of smoke and fog.
(ii) Capacity of our body to resist disease.
(iii) Fixing of developing zygote on the uterine wall.
(iv) The permanent stoppage of menstruation at about the age of 45 years in a female.
(v) The hormone increasing reabsorption of water by kidney tubules.
(vi) A thin membrane covering the entire front part of the eye.
(vii) The lens of eye losing flexibility resulting in a kind of long-sightedness in middle aged people.
(viii) The number of persons living per square kilometre at any given time.
(ix) The sound produced when the atrio-ventricular valves close in the heart.
(x) The process by which white blood cells engulf bacteria. [5]

Question 3

(a) An apparatus as shown below was set up to investigate a physiological process in plants. The setup was kept in sunlight for two hours. Droplets of water were then seen inside the bell jar. Answer the questions that follow:

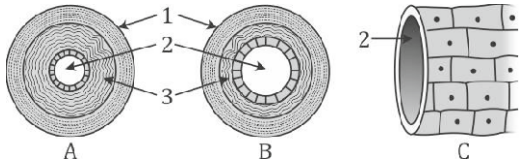


(i) Name the process being studied.
(ii) Explain the process named above in Q.3(a)(i).
(iii) Why was the pot covered with a plastic sheet?
(iv) Suggest a suitable control for this experiment.
(v) Mention two ways in which this process is beneficial to plants.
(vi) List three adaptations in plants to reduce the above mentioned process. [5]

(b) Briefly answer the following questions:
(i) State two reasons for the increase of population in India.
(ii) What is the significance of amniotic fluid?
(iii) What is the function of ear ossicles?
(iv) Mention any two activities of the WHO.
(v) State aw of Dominance. [5]

Question 4

(a) The diagrams given below are cross sections of blood vessels:

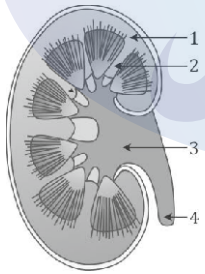


(i) Identify the blood vessels A, B and C.
(ii) Name the parts labelled 1 to 3
(iii) Name the type of blood that flows through A.
(iv) Mention one structural difference between A and B.
(v) In which of the above vessels does exchange of gases actually take place? [5

(b) Differentiate between the following pairs on the basis of what is mentioned within brackets:
(i) Diffusion and Osmosis (Definition)
(ii) RBC and WBC (Shape)
(iii) Tubectomy and Vasectomy (Part cut and tied)
(iv) Vasopressin and Insulin (Deficiency disorder)
(v) Rods and Cones of Retina (Type of pigment) [5

Question 5

(a) The diagram given below shows a section of human kidney. Study the diagram carefully and answer the questions that follow:

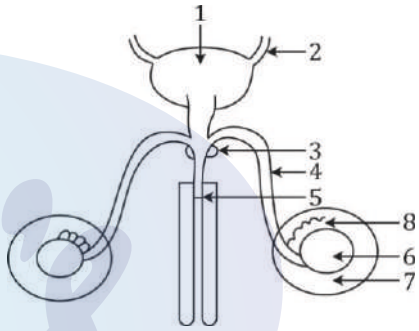


(i) Label the parts numbered 1 to 4
(ii) ....
(iii) .....
present in it.
(iv) Mention the structural and functional units of kidneys.
(v) Name the two major steps in the formation of the fluid mentioned in Q.5(a) (iii). [5

(b) Draw neat and labelled diagrams of the following:
(i) Malpighian Capsule
(ii) A Myelinated Neuron [5

Question 6

(a) The diagram given below shows the male urinogenital system of a human being. Study the diagram and answer the questions that follow:

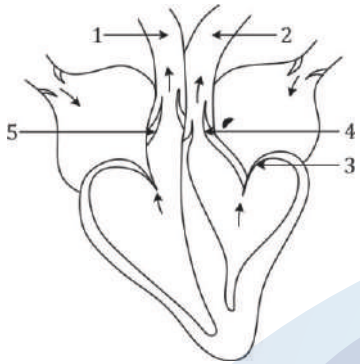


(i) Label the parts numbered 1 to 8
(ii) Name the corresponding structure of part (3) in female reproductive sys tem.
(iii) What is the role of part 7 [5

(b) In a homozygous plant round seeds (R) are dominant over wrinkled seeds (r):
(i) Draw a Punnett square to show the gametes and offspring when both the plants have heterozygous round seeds (Rr).
(ii) Mention the Phenotype and Genotype ratios of the offspring in F_2 generation.
(iii) Name the sec chromosomes in human males and females.
(iv) ....
(v) What is the number of chromosomes in the gametes of human beings? [5

Question 7

(a) The diagram below represents the human heart in one phase of its function. Study the diagram carefully and answer the questions that follow:



(i) Name the phase.
(ii) Which part of the heart is contracting in this phase? Give a reason to support your answer.
(iii) Name the parts labelled 1 to 4
(iv) ...
(v) ...
(vi) Name the membrane that covers the heart. [5]

(b) Explain the following terms:
(i) Greenhouse effect
(ii) Turgor pressure
(iii) Selective reabsorption
(iv) Natality
(v) Pulse

ICSE ACADEMY

ICSE Board
Class X Biology
Board Paper 2016
(Two hours)

General Instructions: **Total Marks: 80**

1. Answers to this paper must be written on the paper provided separately.
*2. You will **not** be allowed to write during the first **15** minutes.*
This time is to be spent in reading the question paper.
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*4. Attempt **all** questions from **Section I** and **any four** questions from **Section II**.*
5. The intended marks of questions or parts of questions are given in brackets [ ].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Question 1

(a) Name the following:
(i) The exchange of chromatid parts between the maternal and the paternal chromatids of a pair of homologous chromosomes during meiosis.
(ii) The number of individuals inhabiting per unit area.
(iii) The immunity acquired by providing readymade antibodies from outside for treating certain infectious diseases.
(iv) The pollutants that cannot be broken down to simple and harmless products.
(v) The part of the brain that carries impulses from one hemisphere of the cerebellum to the other.
[5]

(b) Choose the correct answer from each of the four options given below:
(i) A plant cell may burst when:
A. Turgor pressure equalises wall pressure.
B. Turgor pressure exceeds wall pressure.
C. Wall pressure exceeds turgor pressure.
D. None of the above

(ii) The individual flattened stacks of membranous structures inside the chloroplasts are known as :
A. Grana
B. Stroma
C. Thylakoids
D. Cristae

ICSE ACADEMY

(iii) The nephrons discharge their urine at the :
A. Urinary bladder
B. Urethra
C. Renal pelvis
D. Renal pyramid

(iv) Gigantism and Acromegaly are due to :
A. Hyposecretion of Thyroxine
B. Hyposecretion of Growth hormone
C. Hypersecretion of Thyroxine
D. Hypersecretion of Growth hormone

(v) The mineral ion needed for the formation of blood clot is :
A. Potassium
B. Sodium
C. Calcium
D. Iron

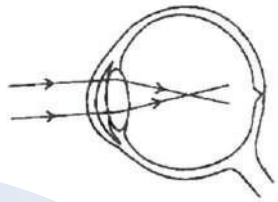
(c) In each set of terms given below, there is an odd one and cannot be grouped in the same category to which the other three belong. Identify the odd erm in each set and name the category to which the remaining three belong. [5]
Example : ovary, Fallopian tube, Ureter, Uterus.
Odd term : Ureter
Category : Parts of female reproductive system.
(i) Sewage, newspaper, Styrofoam, Hay.
(ii) Thymine, Cytosine, Adenine, Pepsin.
(iii) Malleus, iris, Stapes, Incus.
(iv) Cortisone, Somatotropin, Adrenocorticotropic hormone, Vasopression.
(v) Typhoid, Haemophilia, Albinism, Colour blindness.

(d) Complete the following paragraph by filling in the blanks (i) to (v) with appropriate words: [5]
(i) _____ secreted by the (ii) _____ lobe of the pituitary gland. If this hormone secretion is reduced, there is an increased production of urine. This disorder is called (iii) _____. Sometimes excess glucose is passed with urine due to hyposecretion of another hormone called (iv) _____ leading to the cause of a disease called (v) _____.

(e) State the exact location of the following structures: [5]
(i) Centromere
(ii) Chordae tendinae
(iii) Thyroid gland
(iv) Ciliary body
(v) Proximal convoluted tubule.

ICSE ACADEMY

(f) Given below is a diagram depicting a defect of the human eye, study the same and then answer the questions that follow: [5]



(i) Name the defect shown in the diagram.
(ii) What are the two possible that cause this defect?
(iii) Name the type of lens used to correct this defect.
(iv) With the help of a diagram show how the defect shown above is rectified using a suitable lens.

(g) Given in the box below are a set of 14 biological terms. Of these, 12 can be paired into 6 matching pairs. Out of the six pairs, one has been done for you as an example. [5]
Example : endosmosis - Turgid cell.
Identify the remaining *five* matching pairs :

.....
..... disease, Blind spot, Hyperglycemia, Spermatozoa, Endosmosis, Clotting of blood.

(h) State the main function of the following : [5]
(i) Lymphocytes of blood
(ii) Leydig cells
(iii) Guard cells
(iv) Eustachian tube
(v) Corpus luteum

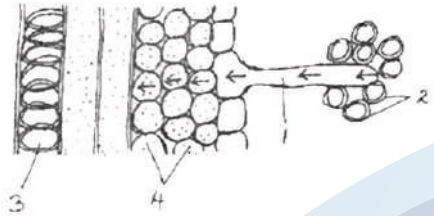
ICSE ACADEMY

SECTION II (40 Marks)

Attempt any four questions from this Section

Question 2

(a) The figure given below is a diagrammatic representation of a part of the cross section of the root in the root hair zone. Study the same and then answer the questions that follow : [5]



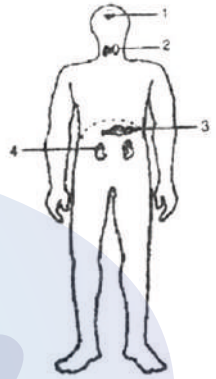
(i) Name the parts indicated by the guidelines 1 to 4.
(ii) Which is the process that enables the passage of water from the soil into the root hair?
(iii) Name the pressure that is responsible for the movement of water in the direction indicated by the arrows. Define it.
(iv) Due to an excess of this pressure sometimes drops of water are found along the leaf margins of some plants especially in the early mornings. What is the phenomenon called?
(v) Draw a well labelled diagram of the root hair cell as it would appear if an excess of fertiliser is added to the soil close to it.

(b) Differentiate between the following pairs on the basis of what is mentioned within brackets : [5]
(i) Human skin cell and Human ovum (number of chromosomes).
(ii) Sperm duct and fallopian rube (function)
(iii) Red Cross and WHO (one activity)
(iv) Rod cells and cone cells (pigment)
(v) LUBB and DUP (names of the valves whose closure produce the sound)

ICSE ACADEMY

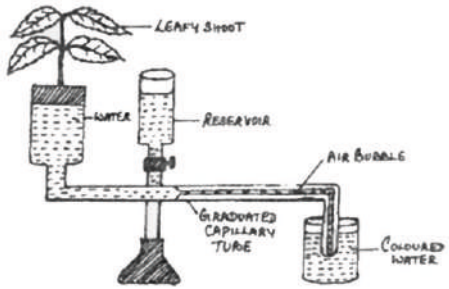
Question 3

(a) Given below is the outline of the human body showing the important glands : [5]



(i) Name the glands marked 1 to 4.
(ii) Name the hormone secreted by part 2. Give one important function of this hormone.
(iii) Name the endocrine part of the numbered 3.
(iv) Why is the part labelled I called the master gland? Which part of the forebrain controls the gland labelled I?
(v) ____

(b) The diagram of an given below demonstrates a particular process in plants. Study the same and answer the questions that follow : [5]



ICSE ACADEMY

(i) Name the apparatus.
(ii) Which phenomenon is demonstrated by this apparatus?
(iii) Explain the phenomenon mentioned in (ii) above.
(iv) State two limitations of using this apparatus.
(v) What is the importance of the air bubble in the experiment?
(vi) Name the structures in a plant through which the above process takes place.

Question 4

(a)

(i) Draw a well labelled diagram of the membranous labyrinth found in the inner car. [5]

(ii) Based on the diagram drawn above in (i) give a suitable term for each of the following descriptions :

1. The sensory cells that helps in hearing.
2. The part that is responsible for static balance of the body.
3. The membrane covered opening that connects the middle car to the inner car.
4. The fluid present in the middle chamber of cochlea.
5. The structure that maintains dynamic equilibrium of the body.

(b) Give the Biological/technical term for the following: [5]

(i) Complete stoppage of menstrual cycle in females.
(ii) Pigment providing colour to urine.
(iii) The vein which drains the blood from the intestine to the liver.
(iv) The canal through which the testes descend into the scrotum just before the birth of a male baby.
(v) The process causing an undesirable change in the environment.
(vi) The removal of nitrogenous wastes from the body.
(vii) The repeating components of each DNA strand lengthwise.
(viii) An alteration in the genetic material that can be inherited.
(ix) The process of uptake of mineral ions against the concentration gradient using energy from the cell.
(x) Blood vessels carrying blood to the left atrium.

ICSE ACADEMY

Question 5

(a) The given diagram shows a stage during mitotic division in an animal cell : [5]

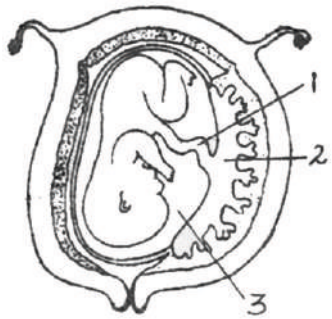
(i) Identify the stage. Give a reason to support your answer.
(ii) Draw a neat labelled diagram of the cell as it would appear in the next stage. Name the stage.
(iii) In what two ways is mitotic division in an animal cell different from the mitotic division in a plant cell?
(iv) Name the type of cell division that occurs during :
A. Growth of a shoot
B. Formation of pollen grains.

(b) Give scientific reasons for the following statements : [5]

(i) Colour blindness is more common in men than in women.
(ii) Injury to medulla oblongata leads to death.
(iii) When an ovum gets fertilized, menstrual cycle stops temporarily in a woman.
(iv) Mature erythrocytes in humans lack nucleus and mitochondria.
(v) Blood flows in arteries in spurts and is under pressure.

Question 6

(a) The diagram given below is that of a developing human foetus. Study the diagram and then answer the questions that follow: [5]



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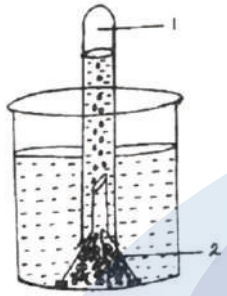
(i) Label the parts numbered 1 to 3 in the diagram.
(ii) Mention any two functions of the part labelled 2 in the diagram.
(iii) Explain the significance of the part numbered 3 in the diagram.
(iv) .....
developing human embryo?
(v) Mention the sex chromosomes in a male and female embryo.

(b) The following diagram demonstrates a physiological process taking place in green plants. The whole set up was placed in bright sunlight for several hours. Study the diagram and answer the questions that follow : [5]



(i) What aspect of the physiological process is being examined?
(ii) Explain the physiological process mentioned in (i) above.
(iii) Label the parts numbered 1 and 2 in the diagram.
(iv) Write a well-balanced chemical equation for the physiological process explained in (ii) above.
(v) What would happen to the rate of bubbling of the gas if a pinch of sodium bicarbonate is added to the water in the beaker? Explain your answer.

Question 7

(a) A homozygous tall plant (T) bearing red coloured (R) flowers is crossed with a homozygous dwarf (t) plant bearing white (r) flowers :-
(i) Give the genotype and phenotype of the plants of F_1 generation.
(ii) Mention the possible combinations of the gametes that can be obtained from the F_1 hybrid plant.
(iii) .....
(iv) Mention the phenotypes of the off springs obtained in F_2 generation.
(v) What is the phenotypic ratio obtained in F_2 generation?

(b) Briefly explain the following terms:
(i) Reflex action
(ii) Power of accommodation
(iii) Photophosphorylation
(iv) Hormone
(v) Synapse

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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 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 1

(a) Name the following: [5]

(i) The process by which root hairs absorb water from the soil.

(ii) The organ which produces urea.

(iii) The kind of lens required to correct Myopia.

(iv) The pituitary hormone which stimulates contraction of uterus during child birth.

(v) The international health organisation which educates people in accident prevention.

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(b) Choose the correct answer from each of the four options given below: [5]

(i) The prime source of chlorofluorocarbons is:

A. Vehicular emissions

B. Industrial effluents

C. Domestic sewage

D. Refrigeration equipments

(ii) Penicillin obtained from a fungus is:

A. Antibiotic

B. Antiseptic

C. Antibody

D. Antiserum

(iii) Marine fish when placed in tap water bursts because of:

A. Endosmosis

B. Exosmosis

C. Diffusion

D. Plasmolysis

(iv) Surgical method of sterilization in a woman involves cutting and tying of:

A. Ureter

B. Uterus

C. Urethra

D. Oviduct

(v) Synthesis phase in the cell cycle is called so, because of the synthesis of more:

A. RNA

B. RNA and proteins

C. DNA

D. Glucose

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(c) The statements given below are *incorrect*. **Rewrite the correct statement** by changing the underlined words of the statements. [5]

(i) The Graafian follicle, after ovulation turns into a hormone producing tissue called Corpus callosum.

(ii) Deafness is caused due to the rupturing of the Pinna.

(iii) Gyri and Sulci are the folds of Cerebellum.

(iv) Free movement of solutes in and out of the cell takes place across the cell membrane.

(v) The solvent used to dissolve the chlorophyll pigments while testing a leaf for starch is Soda lime.

(d) Given below are sets of five terms each. Rewrite the terms in correct order in a logical sequence. [5]

Example: Large intestine, Stomach, Mouth, Small intestine, Oesophagus.

Answer: Mouth Oesophagus Stomach Small intestine Large intestine.

(i) Fibrin, Platelets, Thromboplastin, Fibrinogen, Thrombin.

(ii) Cochlea, Malleus, Pinna, Stapes, Incus.

(iii) Receptor, Spinal cord, Effector, Motor neuron, Sensory neuron.

(iv) Uterus, Parturition, Fertilisation, Gestation, Implantation.

(v) Caterpillar, Snake, Owl, Frog, Green leaves.

(e) Choose the **ODD** one out of the following terms given and name the **CATEGORY** to which the others belong: [5]

(i) Aqueous humour, Vitreous humour, Iris, Central canal

(ii) Formalin, Iodine, DDT, Lime

(iii) ACTH, TSH, ADH, FSH

(iv) Phosphate, RNA, Sugar, Nitrogenous base

(v) Bile, Urea, Uric acid, Ammonia

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(f) Given below are groups of terms. In each group the first pair indicates the relationship between the two terms. Rewrite and complete the second pair on a similar basis. [5]

Example: Oxygen : Inspiration : : Carbondioxide : Expiration

(i) Eye : Optic nerve : : Ear : _____

(ii) Cytoplasm : Cytokinesis : : Nucleus : _____

(iii) TT : Homozygous : : Tt : _____

(iv) Foetus : Amnion : : Heart : _____

(v) Adenine : Thymine : : Cytosine : _____

(g) Match the items given in **Column A** with the most appropriate ones in **Column B** and rewrite the correct matching pairs. [5]

Column A	**Column B**
1. Sacculus	. dynamic body balance
2. Birth rate	. Hyperglycemia
3. DNA and histones	. Hypoglycemia
4. Euro norms	. Natality
5. Diabetes mellitus	. static body balance
	. vehicular standards
	. nucleosome

(h) The diagram given below represents the location and structure of an endocrine gland. Study the same and answer the questions that follow: [5]

(i) Name the endocrine gland shown in the diagram.

(ii) Name the secretion of the gland which regulates basal metabolism.

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(iii) Name the mineral element required for the synthesis of the above mentioned hormone.

(iv) Name the disease caused due to undersecretion of the above mentioned hormone in children.

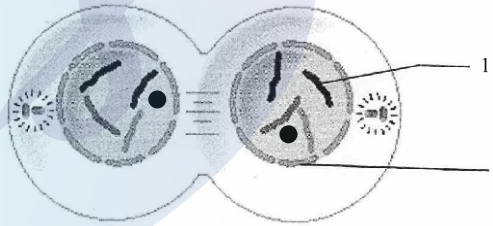
(v) Name the disease caused due to hypersecretion of the above mentioned hormone.

SECTION II (40 Marks)

*Attempt any **four** questions from this Section*

Question 2

(a) Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow: [5]



(i) Identify the stage giving suitable reasons.

(ii) Name the parts numbered 1 and 2.

(iii) What is the technical term for the division of nucleus?

(iv) Mention the stage that comes before the stage shown in the diagram. Draw a neat labelled diagram of the stage mentioned.

(v) Which is the cell division that results in half the number of chromosomes in daughter cells?

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(b) Differentiate between the following pairs on the basis of what is mentioned in brackets: [5]

(i) Active Transport and Diffusion [*significance in plants*]

(ii) Demography and Population density [*Definition*]

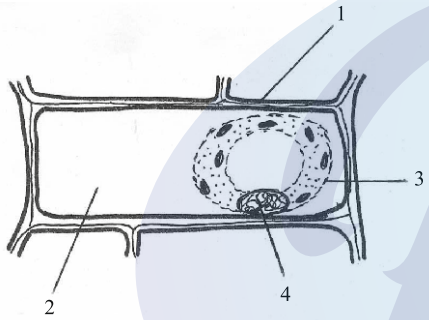
(iii) Antibiotic and Antibody [*Source*]

(iv) Renal cortex and Renal medulla [*Parts of the nephrons present*]

(v) NADP and ATP [*Expand the abbreviation*]

Question 3

(a) The diagram given below represents a plant cell after being placed in a strong sugar solution. Study the diagram and answer the questions that follow: [5]



(i) What is the state of the cell shown in the diagram?

(ii) Name the structure that acts as a selectively permeable membrane.

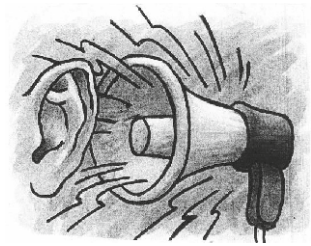
(iii) Label the parts numbered 1 to 4 in the diagram.

(iv) How can the above cell be brought back to its original condition? Mention the scientific term for the recovery of the cell.

(v) State any two features of the above plant cell which is not present in animal cells.

ICSE ACADEMY

(b) Given below is a representation of a kind of pollution. Study the same and answer the questions that follow: [5]



(i) Name the kind of pollution.

(ii) List any three common sources of this pollution.

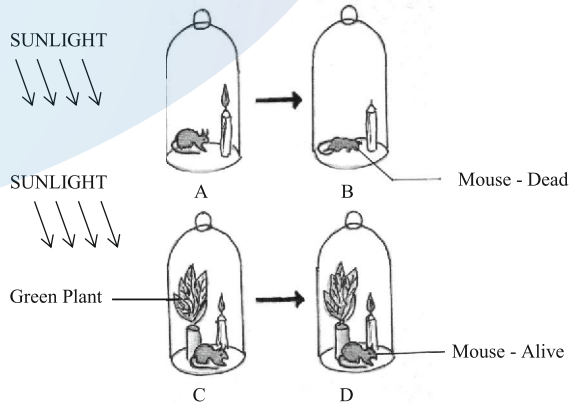
(iii) Mention three harmful effects of this pollution on human health.

(iv)

(v) Name two soil pollutants.

Question 4

(a) The diagrams given below represent the relationship between a mouse and a physiological process that occurs in green plants. Study the diagrams and answer the questions that follow: [5]



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(i) Name the physiological process occurring in the green plant that has kept the mouse alive.

(ii) Explain the physiological process mentioned above.

(iii) Why did the mouse die in bell jar **B**?

(iv) What is the significance of the process as stated in (i) for life on earth.

(v) Represent the above mentioned physiological process in the form of a chemical equation.

(b) Mention the exact location of the following: [5]

(i) Prostate gland

(ii) Myelin sheath

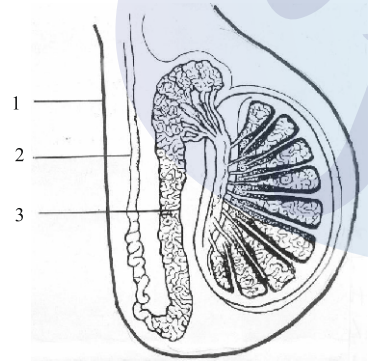
(iii) Islets of Langerhans

(iv) Semi-circular canals

(v) Eustachian tube

Question 5

(a) The diagram shown below is the longitudinal section of a testis of man. Study it carefully and answer the questions that follow: [5]



(i) Label the parts numbered 1 to 3 in the diagram.

(ii) In which part of the testis are the sperms produced?

(iii) State the functions of the parts labelled 1 and 3 in the diagram.

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(iv) Name the cells that secrete Testosterone.

(v) Draw a neat, labelled diagram of a sperm.

(b) Give biological reasons for the following statements: [5]

(i) Some women have facial hair like beard and moustache.

(ii) Cutting of trees should be discouraged.

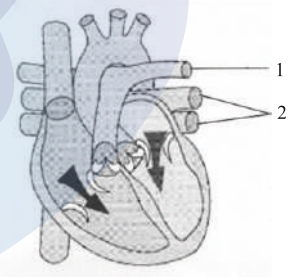
(iii) In some xerophytes leaves are modified into spines.

(iv) There is frequent urination in winter than in summer.

(v) The left ventricle of the heart has a thicker wall than the right ventricle.

Question 6

(a) The diagram given below represents a section of the human heart. Answer the questions that follow: [5]



(i) Which parts of heart are in the diastolic phase? Give a reason to support your answer.

(ii) Label the parts numbered 1 and 2 in the diagram. What type of blood flows through them?

(iii) ....

(iv) Name the blood vessels that supply oxygenated blood to the heart muscles.

(v) Draw neat labelled diagrams of a cross section of an artery and a vein.

ICSE ACADEMY

(b) Give appropriate **biological / technical** terms for the following: [5]

(i) The type of immunity that exists in our body due to our genetic makeup.

(ii) The suppressed allele of a gene.

(iii) The accessory gland in human males whose secretion activates the sperms.

(iv) An apparatus that measures the rate of water uptake in a cut shoot due to transpiration.

(v) The kind of twins formed from two fertilised eggs.

(vi) A pair of corresponding chromosomes of the same size and shape, one from each parent.

(vii) The mild chemical substance which when applied on the body kills germs.

(viii) The type of waste generated in hospitals and pathological laboratories.

(ix) The antiseptic substance in tears.

(x) Cellular components of blood containing haemoglobin.

Question 7

(a) In a homozygous pea plant, axial flowers **(A)** are dominant over terminal flowers **(a).** [5]

(i) What is the phenotype and genotype of the F_1 generation if a plant bearing pure axial flowers is crossed with a plant bearing pure terminal flowers?

(ii) Draw a Punnett square board to show the gametes and offsprings when both the parent plants are heterozygous for axial flowers.

(iii) What is the phenotypic ratio and genotypic ratio of the above cross shown in (ii).

(iv) [illegible] nance.

(v) Name two genetic disorders commonly seen in human males.

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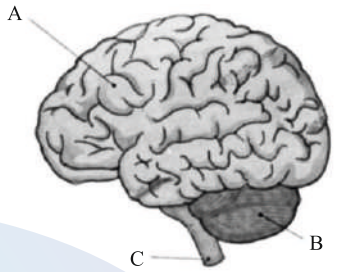
(b) The diagram given below is an external view of the human brain. Study the same and answer the questions that follow: [5]



(i) Name the parts labelled A, B and C in the diagram.

(ii) State the main functions of the parts labelled A and B.

(iii) What are the structural and functional units of the brain? How are the parts of these units arranged in A and C?

(iv) Mention the collective term for the membranes covering the brain.

(v) What is the function of Cerebrospinal fluid?

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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 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 1

(a) Name the following: [5]

(i) The organization which procures and supplies blood during an emergency.

(ii) The blood vessel which supplies blood to the liver.

(iii) The number of chromosomes present in a nerve cell of a human being.

(iv) The layer of the eyeball that forms the transparent Cornea.

(v) The wax-like layer on the epidermis of leaves which reduces transpiration.

This paper consists of 12 printed pages.

ICSE ACADEMY

(b) Choose the correct answer from each of the four options given below: [5]

(i) The number of Spinal nerves in a human being are:

A. 31 pairs

B. 10 pairs

C. 21 pairs

D. 30 pairs

(ii) Which one of the following is non-biodegradable?

A. DDT

B. Vegetable peel

C. Cardboard

D. Bark of trees

(iii) Aqueous humour is present between the:

A. Lens and Retina

B. Iris and Lens

C. Cornea and Iris

D. Cornea and Lens

(iv) A strong chemical substance which is used on objects and surfaces in our surroundings to kill germs:

A. Cresol

B. Carbolic acid

C. Iodine

D. Mercurochrome

(v) Which one of the following is a Greenhouse gas?

A. Oxygen

B. Methane

C. Sulphur dioxide

D. Nitrogen

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ICSE ACADEMY

(c) Complete the following paragraph by filling in the blanks (i) to (v) with appropriate words: [5]

To test a leaf for starch, the leaf is boiled in water to (i)_____. It is then boiled in Methylated spirit to (ii)_____. The leaf is dipped in warm water to soften it. It is placed in a petri dish, and (iii)_____ solution is added. The region of the leaf which contains starch, turns (iv)_____ and the region which does not contain starch, turns (v)_____.

(d) Match the items given in **Column A** with the most appropriate ones in **Column B** and rewrite the correct matching pairs. [5]

Column A	**Column B**
(i) Cretinism	(a) Hypersecretion of adrenal cortex
(ii) Diabetes insipidus	(b) Hyposecretion of Thyroxine
(iii) Exophthalmic Goitre	(c) Hyposecretion of growth hormone
(iv) Adrenal virilism	(d) Hyposecretion of Vasopressin
(v) Dwarfism	(e) Hyposecretion of adrenal cortex
	(f) Hypersecretion of Growth hormone
	(g) Hypersecretion of Thyroxine

(e) Correct the following statements by changing the underlined words: [5]

(i) Normal pale yellow colour of the urine is due to the presence of the pigment *Melanin*.

(ii) The outermost layer of Meninges is *Pia mater*.

(iii) The cell sap of root hair is *Hypotonic.*

(iv) *Xylem* transports starch from the leaves to all parts of the plant body.

(v) *Nitrogen* bonds are present between the complementary nitrogenous bases of DNA.

(f) Choose between the two options to answer the question specified in the brackets for the following: [5]

An example is illustrated below.

Example: Corolla or Calyx (Which is the outer whorl?) *Answer: Calyx*

(i) Blood in the renal artery or renal vein (Which one has more urea?)

(ii) Perilymph or endolymph (Which one surrounds the organ of Corti?)

(iii) Lenticels or stomata (Which one remains open always?)

(iv) Sclerotic layer or choroid layer (Which one forms the Iris?)

(v) Blood in the pulmonary artery or pulmonary vein (Which one contains less oxyhaemoglobin?)

(g) Given below is a representation of a type of pollution. [5]

Study the picture and answer the questions:

(i) Name the type of pollution shown in the picture.

(ii) Name one source of this pollution.

(iii) How does this pollution affect human health?

(iv) Write one measure to reduce this pollution.

(v) State one gaseous compound that leads to the depletion of the ozone layer

(h) Choose the **ODD** one out from the following terms given and name the **CATEGORY** to which the others belong: [5]

Example: *Nose, Tongue, Arm, Eye*

Answer: *Odd Term . Arm, Category . Sense organs*

(i) Detergents, X-rays, sewage, oil spills

(ii) Lumen, muscular tissue, connective tissue, pericardium

(iii) Dendrites, Medullary Sheath, Axon, Spinal cord

(iv) Centrosome, Cell wall, Cell membrane, Large vacuoles

(v) ___ sicle, seminiferous tubules.

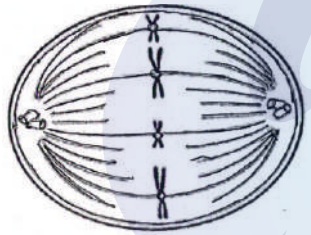
SECTION II (40 Marks)

*Attempt any **four** questions from this Section*

Question 2

(a) The diagram given below represents a stage during cell division. [5]

Study the same and answer the questions that follow:



(i) Identify whether it is a plant cell or an animal cell.
Give a reason in support of your answer.

(ii) Name the stage depicted in the diagram.
What is the unique feature observed in this stage?

(iii) Name the type of cell division that occurs during:

1. Replacement of old leaves by new ones.
2. Formation of gametes.

(iv) What is the stage that comes before the stage shown in the diagram?

(v) Draw a neat, labelled diagram of the stage mentioned in (iv) above keeping the chromosome number constant.

(b) Mention the exact location of the following: [5]

(i) Epididymis

(ii) Lacrimal gland

(iii) Malleus

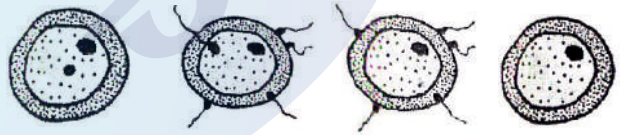
(iv) Hydathodes

(v) Pulmonary semilunar valve

Question 3

(a) Given below are diagrams showing the different stages in the process of fertilisation of an egg in the human female reproductive tract. [5]

Study the diagrams and answer the questions:



A B C D

(i) Arrange the letters given below each diagram in a logical sequence to show the correct order in the process of fertilisation.

(ii) Where does fertilisation normally take place?

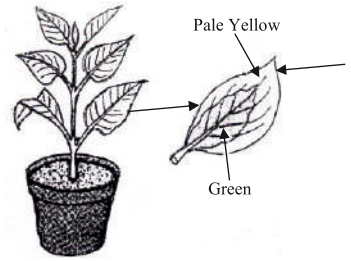
What is mplantation that follows fertilisation?

(iii) Mention the chromosome number of the egg and zygote in humans.

(iv) ___

(v) Draw a neat, labelled diagram of a mature human sperm.

(b) A potted plant with variegated leaves was taken in order to prove a factor necessary for photosynthesis. The potted plant was kept in the dark for 24 hours and then placed in bright sunlight for a few hours. Observe the diagrams and answer the questions. [5]



(i) What aspect of photosynthesis is being tested in the above diagram?

(ii) Represent the process of photosynthesis in the form of a balanced equation.

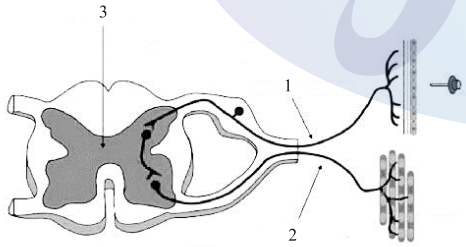
(iii) Why was the plant kept in the dark before beginning the experiment?

(iv) What will be the result of the starch test performed on leaf the diagram? Give an example of a plant with variegated leaves.

(v) Draw a neat labelled diagram of a chloroplast.

Question 4

(a) The diagram given below shows the internal structure of a spinal cord depicting a phenomenon. Study the diagram and answer the questions: [5]



(i) Name the phenomenon that is depicted in the diagram. Define the phenomenon.

(ii) Give the technical term for the point of contact between the two nerve cells.

(iii) Name the parts numbered 1, 2 and 3.

(iv) How does the arrangement of neurons in the spinal cord differ from that of the brain?

(v) Mention two ways by which the spinal cord is protected in our body.

(b) Give appropriate *biological or technical terms* for the following: [5]

(i) Process of maintaining water and salt balance in the blood.

(ii) Hormones which regulate the secretion of other endocrine glands.

(iii) Movement of molecules of a substance from their higher concentration to lower concentration when they are in direct contact.

(iv) The condition in which a pair of chromosomes carry similar alleles of a particular character.

(v) The complex consisting of a DNA strand and a core of histones.

(vi) The onset of menstruation in a young girl.

(vii) Squeezing out of white blood cells from the capillaries into the surrounding tissues.

(viii) The fluid which surrounds the foetus.

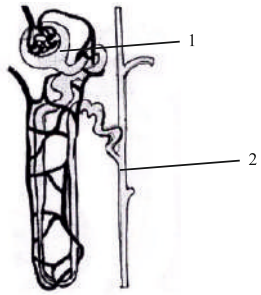
(ix) The relaxation phase of the heart.

(x) The difference between the birth rate and the death rate.

Question 5

(a) The diagram given below is that of a structure present in a human kidney. [5]

Study the same and answer the questions that follow:



(i) Name the structure represented in the diagram.

(ii) ...

Name two substances present in this liquid that are reabsorbed in the tubule.

(iii) ...

Name the main nitrogenous waste in it.

(iv) Mention the three main steps involved in the formation of the fluid mentioned in (iii) above.

(v) ...

suffers from Diabetes mellitus.

(b) Differentiate between the following pairs on the basis of what is indicated in the brackets. [5]

(i) Leaf and Liver [form in which glucose is stored]

(ii) ATP and AIDS [expand the abbreviations]

(iii) Testosterone and Oestrogen [organ which secretes]

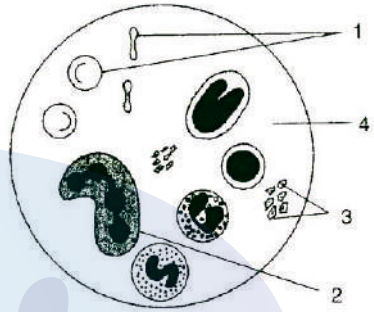
(iv) Ureter and Urethra [function]

(v) Hypotonic solution and Hypertonic solution [condition of a plant cell when placed in them]

Question 6

(a) Given below is a diagram of a human blood smear. [5]

Study the diagram and answer the questions that follow:



(i) Name the components numbered ...

(ii) Mention two structural differences between the ...

(iii) N...

during clotting of blood.

(iv) What is the average life... ?

(v) Component ... certain organelles but are very efficient in their function. Explain.

(b) Give biological explanations for the following: [5]

(i) Education is very important for population control.

(ii) The placenta is an important structure for the development of a foetus.

(iii) All the food chains begin with green plants.

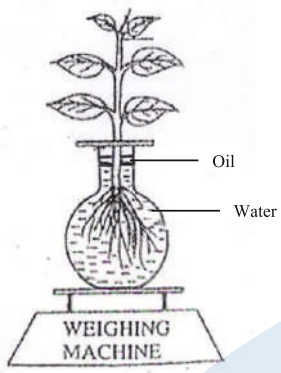
(iv) Plants growing in fertilized soil are often found to wilt if the soil is not adequately watered.

(v) We should not put sharp objects into our ears.

Question 7

(a) The diagram below represents a process in plants. [5]

The setup was placed in bright sunlight. Answer the following questions:



(i) Name the physiological process depicted in the diagram.
Why was oil added to the water?

(ii) When placed in bright sunlight for four hours, what do you observe with regard to the initial and final weight of the plant?
Give a suitable reason for your answer.

(iii) What happens to the level of water when this setup is placed in:

1. Humid conditions?
2. Windy conditions?

(iv) Mention any three adaptations found in plants to overcome the process mentioned in (i).

(v) ...

(b) A pea plant which is homozygous for Green pods which are inflated [GGII] is crossed with a homozygous plant for yellow pods which are constricted [ggii]. [5]
Answer the following questions:

(i) Give the phenotype and genotype of the F_1 generation.
Which type of pollination has occurred to produce F_1 generation?

(ii) Write the phenotypic ratio of the F_2 generation.

(iii) Write the possible combinations of the gametes that can be obtained if two F_1 hybrid plants are crossed.

(iv) ...

(v) What is the scientific name of the plant which Mendel used for his experiments on inheritance?

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 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 1

(a) Name the following: [5]

(i) The layer of the eyeball that provides nourishment to the eye.

(ii) One gaseous compound which depletes the ozone layer.

(iii) The structure which connects the placenta and the foetus.

(iv) A pair of corresponding chromosomes of the same shape and size and derived one from each parent.

(v) The compound formed when haemoglobin combines with carbon dioxide in blood.

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(b) Correct and *rewrite the statements* by changing the biological term that is underlined for each statement: [5]

(i) The theory of Inheritance of Acquired Characters was proposed by Watson and Crick.

(ii) The protective sac which develops around the developing embryo is called the Pericardium.

(iii) Maintaining balance of the body and coordinating muscular activities is carried out by the cerebrum.

(iv) The kidney is composed of number of neurons.

(v) The part of the eye which can be donated from a clinically dead person is the Retina.

(c) Give suitable *biological reasons* for the following statements: [5]

(i) The birth rate in India is very high.

(ii) Carbon monoxide is dangerous when inhaled.

(iii) Root hairs become flaccid and droop when excess fertilizers are added to the moist soil around them.

(iv) Acid rain is harmful to the environment.

(v) All life on Earth is supported by Photosynthesis.

(d) Match the items given in Column A with the most appropriate ones in Column B and **REWRITE** the correct matching pairs: [5]

Column A	**Column B**
(i) Cranial nerves	Testosterone
(ii) Leydig cells	Natural reflex
(iii) Acetylcholine	12 pairs
(iv) Spinal nerves	Prolactin
(v) Sneezing	Neurotransmitter
	18 pairs
	31 pairs
	Conditioned reflex

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(e) Choose the correct answer from the four options given below: [5]

(i) While recording the pulse rate, where exactly does a doctor press on our wrist?

A. Nerve
B. Vein
C. Artery
D. Capillary

(ii) In a human male, a sperm will contain:

A. Both X and Y chromosomes
B. Only Y chromosome
C. Only X chromosome
D. Either X or Y chromosome

(iii) A muscular wall is absent in:

A. Capillary
B. Venule
C. Arteriole
D. Vein

(iv) On which day of the menstrual cycle does ovulation take place?

A. 5^{th} day
B. 28^{th} day
C. 14^{th} day
D. 1^{st} day

(v) Which one of the following does not affect the rate of transpiration?

A. Light
B. Humidity
C. Wind
D. Age of the plant

(f) Identify the **ODD** term in each set and name the **CATEGORY** to which the remaining three belong: [5]

Example: glucose, starch, cellulose, calcium
Odd term: calcium
Category: others are different types of carbohydrates.

(i) ... rome, Acromegaly, Leukemia.

(ii) Insulin, Adrenaline, Pepsin, Thyroxine.

(iii) Axon, Dendron, Photon, Cyton.

(iv) Chicken pox, Colour blindness, Haemophilia, Albinism.

(v) Polythene bag, Crop residue, Animal waste, Decaying vegetable.

(g) Expand the following biological abbreviations: [5]

(i) ABA

(ii) IAA

(iii) ATP

(iv) DNA

(v) TSH

(h) Study the picture given below and answer the following questions: [5]

(i) Identify the type of pollution.

(ii) Name one pollutant that causes the above pollution.

(iii) Mention the impact of this pollution on human health.

(iv) State one measure to control this pollution.

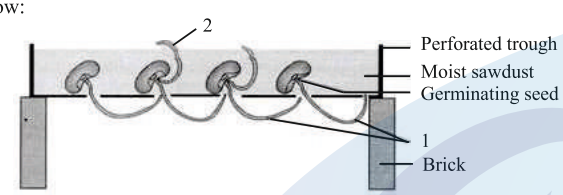
(v) ....

SECTION II (40 Marks)

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

Question 2

(a) Given below is an experimental setup to demonstrate a particular tropic movement in germinating seeds. Study the diagram and answer the questions that follow: [5]



(i) Label the parts 1 and 2.

(ii) Name the tropic movement shown by part 1.

(iii) Part 1 is affected by two stimuli. Name them. Which one of the two is stronger?

(iv) What is Thigmotropism? Give one example.

(v) ....

(b) Mention the exact location of the following: [5]

(i) Testis

(ii) Incus

(iii) Thylakoids

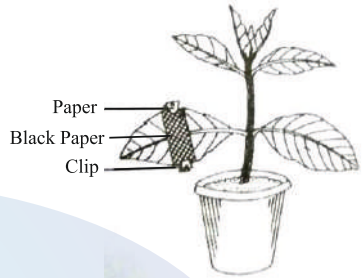
(iv) Amniotic fluid

(v) Corpus callosum

ICSE ACADEMY

Question 3

(a) The diagram given below represents an experiment to prove the importance of a factor in photosynthesis. Answer the questions that follow: [5]



(i) Name the factor studied in this experiment.

(ii) What will you observe in the experimental leaf after the starch test?

(iii) Explain the process of Photosynthesis.

(iv) Give a balanced chemical equation to represent the process of photosynthesis.

(v) Draw a neat, labelled diagram of an experimental setup to show that oxygen is released during photosynthesis.

(b) State the main functions of the following: [5]

(i) Medulla Oblongata

(ii) Cytokinins

(iii) Tears

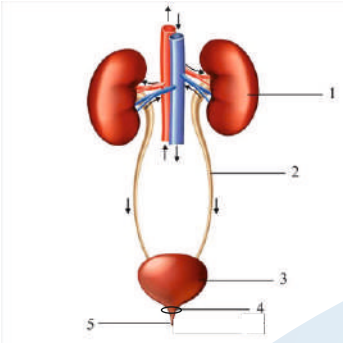
(iv) Coronary Artery

(v) Seminal Vesicles

ICSE ACADEMY

Question 4

(a) The diagram given below represents an organ system in the human body. [5]
Study the same and answer the questions that follow:



(i) Identify the system.

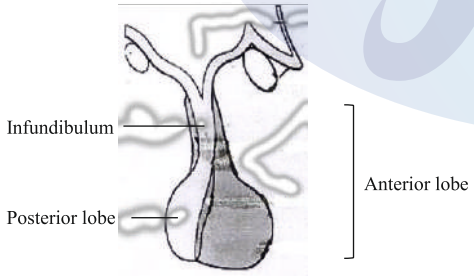
(ii) Label the parts marked 2 and 4. Mention the function of part 5.

(iii) Name the structural and functional units of the part marked 1.

(iv) What is the fluid that accumulates in part 3?
Which is the main nitrogenous waste present in it?

(v) Draw a neat, labelled diagram showing the longitudinal section of part 1.

(b) The diagram given below represents an endocrine gland in the human body. [5]
Study the diagram and answer the following questions:



(i) Identify the endocrine gland. Where is it located?

(ii) .....

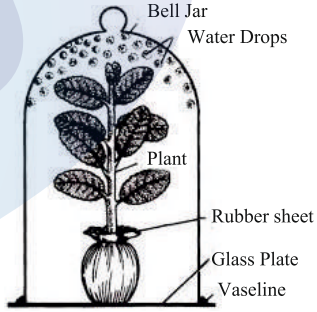
(iii) Name the hormone which in deficiency causes Diabetes Insipidus.
How does this disorder differ from Diabetes Mellitus?

(iv) ..
What is the role of Tropic hormones in the human body?

(v) Which lobe of the above gland secretes:
1. Oxytocin
2. ACTH
3. Growth hormone

Question 5

(a) Given below is an apparatus which was setup to investigate a physiological process in plants. The setup was placed in bright sunlight. Answer the questions that follow: [5]



(i) Name the process being studied. Define the process.

(ii) Why was the pot enclosed in a rubber sheet?

(iii) Mention two external factors which can accelerate the above process.

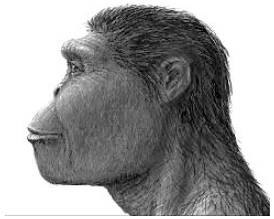
(iv) List two adaptations in plants to reduce the above process.

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

(b) Given below are two stages in the evolution of man. [5]

Study them and answer the questions that follow:

A



B

(i) Identify Australopithecus and Neanderthal man from the above pictures.

(ii) Mention two characteristic features each for the two stages.

(iii) ...

(iv) ...

(v) Give two examples of Vestigial organs in humans.

Question 6

(a) ... pea [5]

plants (t).

(i) What is the phenotype and genotype of the F_1 generation if a homozygous tall plant is crossed with a homozygous dwarf plant?

(ii) Draw a Punnett square board to show the gametes and offspring when both the parents are heterozygous for tallness.

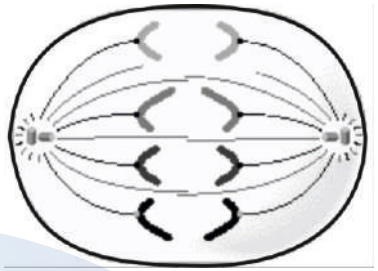
(iii) What is the phenotypic ratio and genotypic ratio of the above cross in (ii)?

(iv) ...

(v) What is a Dihybrid Cross?

(b) Given below is a diagram representing a stage during the mitotic cell division. [5]

Study the diagram and answer the following questions:



(i) Identify the stage by giving a suitable reason.

(ii) Is it a plant or an animal cell? Give a reason to support your answer.

(iii) Draw a neat, labelled diagram of the stage which follows the one shown in the diagram.

(iv) How many chromosomes will each daughter cell have after the completion of the above division?

(v) Name the four nitrogenous bases.

Question 7

(a) Answer the following questions briefly: [5]

(i) How are the cytons and axons placed in the brain and the spinal cord?

(ii) ...

to the body?

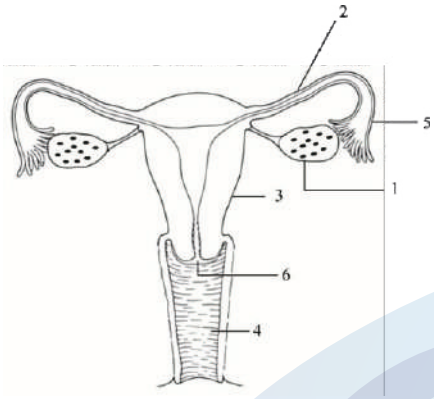
(iii) Explain how the human eye adapts itself to bright light and dim light.

(iv) What is Parthenocarpy? Give one example.

(v) Mention any ...

(b) The diagram given below represents a system in the human body. [5]

Study the diagram and answer the following questions:



(i) Identify the system.

(ii) Label the parts marked 5 and 6.

(iii) Name the two hormones secreted by 1.

(iv) Mention the number and the name of the part involved in fertilization and implantation from the above diagram.

(v) Mention the surgical methods of contraception in:

1. Human males.
2. Human females.

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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 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 1

(a) Name the following: [5]

(i) The process of transformation of several glucose molecules into one molecule of starch.

(ii) The point of attachment of two chromatids.

(iii) The iron containing pigment in erythrocytes.

(iv) The duct which transports urine from the kidney to the urinary bladder.

(v) The part of the brain which is concerned with memory.

This paper consists of 11 printed pages and 1 blank page.

ICSE ACADEMY

(b) Explain the following terms: [5]

(i) Allele

(ii) Diffusion

(iii) Photolysis

(iv) Phenotype

(v) Population density

(c) Given below are certain groups of terms. In each group the first pair indicates a relationship between the two terms. Rewrite and complete the second pair on a similar basis. [5]

Example: Cytoplasm : Cytokinesis :: Nucleus : Karyokinesis.

(i) Widening of hips: Oestrogen :: Deepening of voice in males : _____.

(ii) Brain : Meninges :: Heart : _____.

(iii) Insulin : Beta-cells :: Glucagon : _____.

(iv) Kidney: Renal artery :: Liver : _____.

(v) Uterus : Implantation :: Fallopian tube : _____.

(d) Given below are sets of five terms each. Rewrite the terms in correct order in a logical sequence beginning with the first word that is underlined: [5]

(i) Stimulus, Response, Receptor, Effector, Spinal cord.

(ii) Root hair, Endodermis, Epidermis, Xylem, Cortex.

(iii) Conjunctiva, Yellow spot, Pupil, Vitreous Humour, Aqueous Humour.

(iv) Australopithecus, Cro-Magnon Man, Homo erectus, Neanderthal Man, Homo sapiens.

(v) Artery, Capillaries, Venule, Vein, Arteriole.

ICSE ACADEMY

(e) Choose the correct answer from the four options given below: [5]

(i) The fusion of the sperm and ovum is termed as:

A. Reproduction

B. Development

C. Fertilization

D. Embryo

(ii) Agranulocytes are:

A. Lymphocytes, Monocytes

B. Lymphocytes, Basophils

C. Eosinophils, Basophils

D. Eosinophils, Monocytes

(iii) Which of the following is not a natural reflex action?

A. Knee-jerk

B. Blinking of eyes due to strong light

C. Salivation at the sight of food

D. Sneezing when any irritant enters the nose

(iv) The structural and functional units of excretion in the human kidney is the:

A. Ureter

B. _

C. Renal pelvis

D. Nephron

(v) In a human female, ovum consists of:

A. 23 pairs of autosomes

B. 22 pairs of autosomes and 1 pair of sex chromosomes

C. 22 autosomes and 1 Y-chromosome

D. 22 autosomes and 1 X-chromosome

ICSE ACADEMY

(f) Identify the **ODD** term in each set and name the **CATEGORY** to which the remaining three belong: [5]

(i) Auxin, Ethylene, Adrenaline, Cytokinin

(ii) Tympanum, Ear ossicles, Auditory canal, Pinna

(iii) Syringes, Soiled dressings, Discarded needles, Household detergents

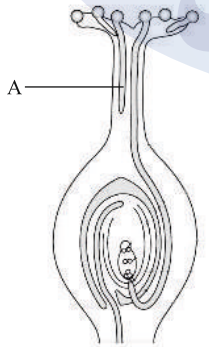
(iv) Exophthalmic Goiter, Simple Goitre, Cretinism, Myxoedema

(v) Adenine, Guanine, Creatinine, Cytosine

(g) Match the items given in column A with the most appropriate ones in Column B and **REWRITE** the correct matching pairs: [5]

Column A		**Column B**
(i) Biston betularia	-	Calcium
(ii) Testes	-	balance of the body
(iii) Clotting of blood	-	Light independent reaction
(iv) Stroma	-	diffusion of gases
(v) Stomata	-	gonad
	-	Peppered moth
	-	Light dependent reaction
	-	Chlorophyll

(h) The diagram given below represents a plant movement. Answer the following questions: [5]



(i) Name the tropic movement shown in the diagram.

(ii) Explain the tropic movement mentioned in (i).

(iii) _

(iv) What is part A attracted to?

(v) Give an example of a plant which shows Thigmotropism.

SECTION II (40 Marks)

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

Question 2

(a) The diagram given below represents an experiment to prove the importance of a factor in photosynthesis. Answer the questions that follow: [5]

(i) Which factor is being studied here?

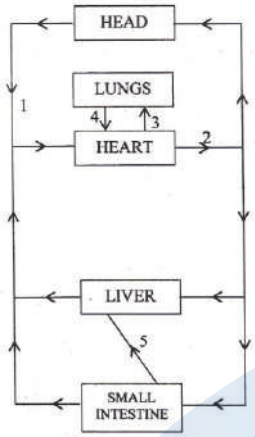
(ii) What is the purpose of keeping KOH in the flask?

(iii) Explain the term Photosynthesis.

(iv) What will you observe when the leaf A is tested for starch?

(v) Write a well balanced chemical equation for the process of photosynthesis.

(b) The diagram given below represents the simplified pathway of the circulation of blood. Answer the questions that follow: [5]



(i) Name the blood vessels labelled 1 to 4.

(ii) Which blood vessel supplies oxygenated blood to the muscles of the heart?

(iii) What is the importance of blood vessel labelled 5?

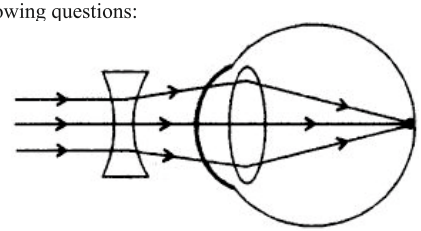
(iv) What is the type of blood circulation that takes place between the heart and the lungs?

(v) Draw a diagram of the different blood cells as seen in a smear of human blood.

Question 3

(a) The diagram given below depicts a defect of the human eye which has been corrected by using a suitable lens. [5]

Answer the following questions:



(i) Name the defect that has been corrected.
Which type of lens has been used for the correction?

(ii) Mention one cause for the above defect.

(iii) Where would the image have formed if the above lens was not used for correction?

(iv) Name the three concentric layers of the eyeball.

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

(b) Give the biological reasons for the following statements: [5]

(i) It is advisable to keep green plants in an aquarium.

(ii) Water pollution is a major cause of concern in our country.

(iii) We cannot distinguish colours in dim light.

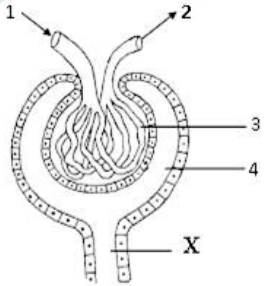
(iv) Medical discoveries such as antibiotics and vaccinations have indirectly contributed to the sharp rise in human population.

(v) Homo sapiens sapiens is the most highly evolved form of man.

Question 4

(a) The figure given below shows a part of a nephron. [5]

Answer the questions that follow:



(i) In which region of the kidney is the above structure present?

(ii) Label the parts numbered 1 to 4.

(iii) What is the technical term for the process that occurs in part 3?

(iv) Why is fluid X not called urine? Justify your answer.

(v) Draw a neat, labelled diagram of the urinary system of man.

(b) Differentiate between the following pairs on the basis of what is mentioned in the brackets: [5]

(i) Transpiration and Guttation (place of occurrence)

(ii) Biodegradable waste and Non-biodegradable waste (One example)

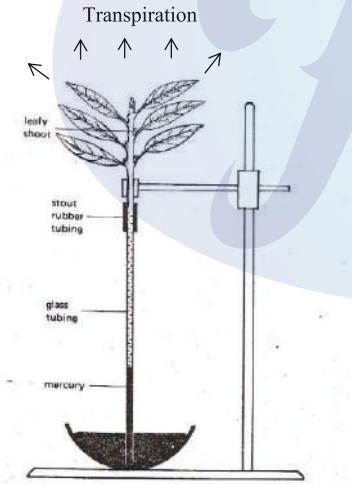
(iii) Population control and Swachh Bharat Abhiyan (One objective)

(iv) Osmosis and Active Transport (Substances undergoing movement)

(v) Metaphase and Anaphase (Position of chromosomes)

Question 5

(a) The diagram below represents an experiment to demonstrate a certain phenomenon in a green plant: [5]



(i) Will the level of mercury in the glass tubing rise or fall?
Which conducting tissue of the plant does the glass-tubing represent?

(ii) Define Transpiration.

(iii) How will the rate of the above process differ if the environment of the plant has:

1. Less humidity
2. High temperature?

(iv) State any two advantages of transpiration to the plant.

(v) Draw a neat labelled diagram of a Plasmolysed cell.

(b) Give appropriate biological/ technical terms for the following: [5]

(i) The sensory organ in Cochlea.

(ii) Number of live births per 1000 people per year.

(iii) The point of contact between two neurons.

(iv) The accessory gland in human males whose secretion neutralises the acid in the vagina.

(v) Condition when blood sugar level is lowered in the blood.

(vi) Structure which helps in the adjustment of the size of the pupil.

(vii) A surgical method of fertility control in human males.

(viii) Process by which leucocytes migrate through the walls of capillaries.

(ix) A sudden inheritable change in one or more genes.

(x) A non-dividing phase of the cell cycle where more DNA is synthesised.

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Question 6

(a) State two functions of: [5]

(i) Ear

(ii) Ethylene

(iii) Tears

(iv) Testis

(v) Cerebellum

(b) Complete the table: [5]

Name of the Hormone	Endocrine Gland	Function
(i)	(ii)	Deposits extra glucose of blood as glycogen
Growth Hormone	(iii)	(iv)
(v)	Thyroid	(vi)
(vii)	(viii)	Prepare body for any emergency
Oxytocin	(ix)	(x)

Question 7

(a) A homozygous dominant tall pea plant bearing red flowers (TTRR) is crossed with a homozygous recessive dwarf pea plant bearing white flowers (ttrr). [5]

(i) What is the phenotype and genotype of F_1 individuals?

(ii) Write the possible combination of gametes that are obtained when two F_1 hybrid plants are crossed.

(iii) Mention the phenotypic ratio of the F_2 generation.

(iv) State Mendel

(v) Name two X-linked disorders found in humans.

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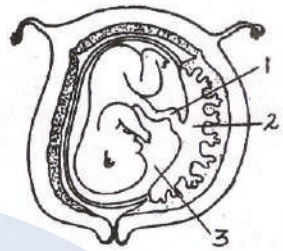
(b) The diagram given below is that of a developing human foetus. [5]

Answer the questions that follow:



(i) Label the parts numbered 1 to 3 in the diagram.

(ii) Mention any two functions of the part labelled 2 in the diagram.

(iii) Explain the significance of the part numbered 3 in the diagram.

(iv) What is the normal gestational period of the developing embryo?

(v) Mention the sex chromosomes in a male and female embryo.

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BIOLOGY

(SCIENCE PAPER □ 3)

Maximum Marks: 80

Time allowed: Two hours

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 answers.

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

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

SECTION A (40 Marks)

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

Question 1

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

(Do not copy the questions, write the correct answer only).

(i) The sex chromosome in a human ovum is:

(a) X chromosome

(b) Y chromosome

(c) Both X and Y chromosomes

(d) Either X or Y chromosome

(ii) Which one of the following is a biodegradable waste?

(a) Metal cans

(b) E-waste

(c) Plastic

(d) Flowers

(iii) The heart sound □Dup□ is produced when:

(a) Semilunar valves open

(b) Atrio ventricular valves close

(c) Semilunar valves close

(d) Atrio ventricular valves open

(iv) Deplasmolysis occurs when a plasmolysed cell is placed in:

(a) Concentrated salt solution

(b) Tap water

(c) Concentrated sugar solution

(d) Hypertonic salt solution

(v) Alpha cells of Pancreas secrete:

(a) Glycogen

(b) Glucose

(c) Glucagon

(d) Insulin

(vi) Haploid number of chromosomes are found in:

(a) Nephrons

(b) Neurons

(c) Skin cells

(d) Sperms

(vii) The life span of an RBC is:

(a) 120 days

(b) 220 days

(c) 20 days

(d) 2 weeks

(viii) The statistical study of human population is called:

(a) Mortality

(b) Demography

(c) Natality

(d) Equality

(ix) The pale yellow colour of normal human urine is due to the pigment:

(a) Melanin

(b) Anthocyanin

(c) Urochrome

(d) Haemoglobin

(x) Stimulation of the nerves of the sympathetic nervous system:

(a) Accelerates heartbeat

(b) Constricts pupil of eyes

(c) Increases peristalsis

(d) Retards heartbeat

(xi) The site of light reaction in the cells of a green leaf is:

(a) Nucleus

(b) Grana of chloroplast

(c) Cytoplasm

(d) Stroma of chloroplast

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(xii) The paper used to demonstrate unequal transpiration in a dicot leaf is:

(a) Filter paper

(b) Litmus paper

(c) Starch paper

(d) Cobalt chloride paper

(xiii) Vitreous humour is present between:

(a) Cornea and Iris

(b) Lens and Retina

(c) Iris and Lens

(d) Cornea and Lens

(xiv) Oxygenated blood to liver is supplied by:

(a) Hepatic artery

(b) Hepatic vein

(c) Inferior venacava

(d) Hepatic portal vein

(xv) During the synthesis phase of the cell cycle, more of:

(a) RNA is synthesised

(b) RNA and proteins are synthesised

(c) DNA is synthesised

(d) Glucose is synthesized

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Question 2

(i) Name the following: [5]

(a) The organelle that forms the aster during cell division.

(b) A genetic disorder in which the blood does not clot.

(c) The permanent stoppage of menstruation in human females around the age of 45 years.

(d) The openings on the barks of trees through which transpiration occurs.

(e) A gaseous plant hormone which promotes ripening of fruits.

(ii) Arrange and rewrite the terms in each group in correct order to be in a logical sequence *beginning* with the term that is underlined: [5]

(a) Snake, Rabbit, Cabbage, Hawk.

(b) Xylem, Soil water, Cortical cells, Root hair.

(c) Receptor, Response, Effector, Spinal Cord

(d) Fovea, Lens, Cornea, Conjunctiva.

(e) Testis, Urethra, Sperm duct, Epididymis.

(iii) Match the items given in **Column I** with most appropriate ones in **Column II** and rewrite the correct matching pairs: [5]

Column I	**Column II**
(a) Hyposecretion of Thyroxine in adults	1. Diabetes insipidus
(b) Hyposecretion of Insulin	2. Myxedema
(c) Hypersecretion of Growth hormone in childhood	3. Dwarfism
(d) Hyposecretion of ADH	4. Gigantism
(e) Hypersecretion of Thyroxine	5. Diabetes mellitus
	6. Exophthalmic goitre
	7. Cretinism

(iv) Choose the **odd** one out from the following terms and name the **category to which the others belong**: [5]

(a) Used bandages, Pesticides, Face masks, Syringes.

(b) Dust, Smoke, Carbon monoxide, Effluents

(c) Uterus, Urethra, Urinary bladder, Ureter

(d) Menstrual phase, Telophase, Follicular phase, Luteal phase

(e) Malleus, Incus, Cochlea, Stapes

(v) State the exact location of the following structures: [5]

(a) Thyroid gland

(b) Dura mater

(c) Amniotic fluid

(d) Papillary muscles

(e) Islets of Langerhans

SECTION B (40 Marks)

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

Question 3

(i) Write the overall chemical equation for photosynthesis. [1]

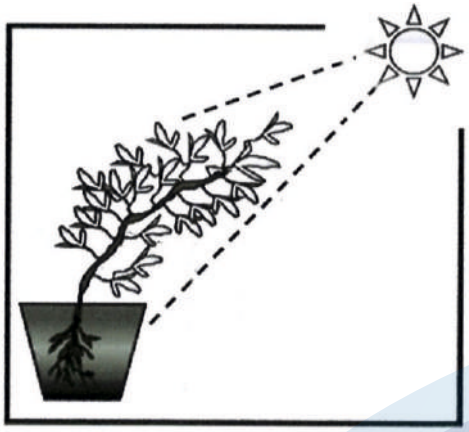
(ii) Mention *any two* functions of blood. [2]

(iii) Differentiate between Karyokinesis and Cytokinesis. [2]

(iv) *Excessive use of fertilizers in agricultural fields reduces the yield of crops.* [2]

Justify the statement.

(v) Study the diagram given below and answer the questions that follow: [3]



(a) Name the phenomenon depicted by the shoot in the above diagram.

(b) Which plant hormone plays an important role in the above movement?

(c) Complete and rewrite the given statement by filling in the correct terms:

Shoots show positive _____ whereas, roots show positive _____.

Question 4

(i) Expand the abbreviation □DNA. [1]

(ii) What is Active transport? [2]

(iii) Mention the *two* pairs of nitrogenous bases which pair with each other with hydrogen bonds. [2]

(iv) State Mendel□s □Law of Segregation□. [2]

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

Question 5

(i) Explain the term □Population density□. [1]

(ii) Name the *two* surgical methods of population control. [2]

(iii) Mention *two* factors responsible for population explosion in India. [2]

(iv) Name *any two* resources which come under pressure due to rising population. [2]

(v) The diagram given below depicts the climate change on planet Earth. [3]

Answer the following questions:

(a) Name the climatic phenomenon for the increase in Earth□s temperature.

(b) Mention *one* reason for this warming.

(c) What measure can be taken to prevent this climate change?

Question 6

(i) Define the term Transpiration. [1]

(ii) State *any two* adaptations in plants to reduce transpiration. [2]

(iii) Mention *any two* functions of the human foetal placenta. [2]

(iv) What is the significance of the human testes being located in scrotal sacs outside the abdomen? [2]

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

Question 7

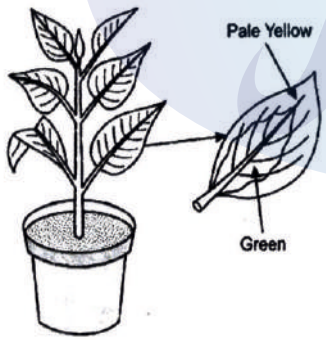
(i) What is a Reflex action? [1]

(ii) Renal cortex has a dotted appearance and Renal medulla has a striped appearance. Explain. [2]

(iii) What are the *two* functions of cerebellum. [2]

(iv) Distinguish between Semicircular canals and Utriculus based on their function. [2]

(v) A potted plant with variegated leaves was kept in dark for 24 hours and then placed in bright sunlight. Answer the following questions. [3]



(a) Which aspect of photosynthesis is being tested in the above diagram?

(b) Why was the plant kept in dark for 24 hours?

(c) After the starch test what will be the colour of the yellow and green parts of the leaf? Give reasons to support your answer.

Question 8

(i) Define the term Mutation. [1]

(ii) A pure breeding red flower variety of pea plant (RR) is crossed with a pure breeding white flower variety of pea plant (rr). [2]

Draw a Punnett square to find out the Phenotypic and Genotypic ratios of the progeny belonging to the F_2 generation.

(iii) Leaves of certain plants roll up on a hot sunny day. [2]

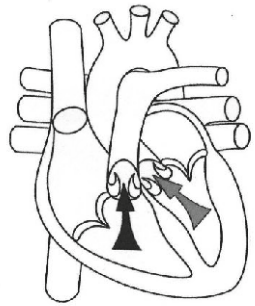
Explain by giving suitable reasons.

(iv) What is a semi permeable membrane? [2]

Name the semi permeable membrane present in a plant cell.

(v) The diagram below depicts the human heart in one of its phases. [3]

Answer the questions that follow:



(a) Which part of the heart is in the contraction phase?

(b) Give a suitable reason to justify your answer in (a).

(c) Distinguish between Systole and Diastole.

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