



# ICSE Class 10 Biology Question Paper Solution 2018

## BIOLOGY (PAPER-3 )

### 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.
- (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. Carboic acid
- C. Iodine
- D. Mercurochrome

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

- A. Oxygen
- B. Methane
- C. Sulphur dioxide
- D. Nitrogen

(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**

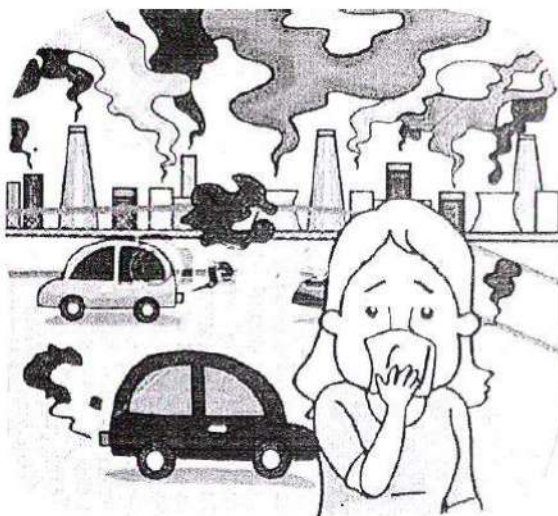
- (i) Cretinism
- (ii) Diabetes insipidus

**Column B**

- (a) Hypersecretion of adrenal cortex
- (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 and creates 'Ozone holes'.
- (h) Choose the **ODD** one out from the following terms given and name the **CATEGORY** [5]  
to which the others belong:  
*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) Prostate gland, Cowper's gland, seminal vesicle, seminiferous tubules.



## Comments of Examiners

- (a) (i) Most candidates wrote the correct answer. *WHO* was written as an incorrect answer by some candidates.
- (ii) Majority of candidates wrote the correct answer. However, some candidates were confused between *Hepatic artery* and *Hepatic vein*.
- (iii) Most candidates answered correctly. Some candidates, however, wrote the *chromosome number of gametes* instead of *number of chromosomes present in a nerve cell*.
- (iv) Many candidates wrote *choroid* instead of *sclera*. Some candidates could not spell the term correctly.
- (v) Most candidates wrote the correct answer.
- (b) (i) Most candidates wrote the number of Spinal nerves in a human being correctly.
- (ii) Most candidates chose the correct non-biodegradable from the options given.
- (iii) Many candidates were unsure of the location of aqueous humour.
- (iv) Most candidates wrote the correct answer.
- (v) Most candidates wrote the correct option from the given four alternatives for a Greenhouse gas.
- (c) In the given paragraph, most candidates filled in the appropriate words in the blanks (i), (iii)-(v). However, a few candidates could not fill in the appropriate word in the blank (ii), which shows that some candidates did not know the usage of methylated spirit in the starch test.
- (d) Most candidates wrote the most appropriate matching pairs for the items given in column A and column B.
- (e) (i) Majority of the candidates, instead of writing *Urochrome*, wrote *Bilirubin*.
- (ii) Many candidates were confused with the location of the three meninges. In sub-parts (iii)-(v), most candidates corrected the statements by changing the underlined words correctly. However, a few candidates changed the underlined word in statement (v) to *Covalent* instead of *Hydrogen*.
- (f) (i) Majority of the candidates chose the correct option to answer the question specified in the bracket. However, a few candidates were confused between renal artery and renal vein.

## Suggestions for teachers

- Give importance to each step of the 'Starch Test' which is done at the end of an experiment on photosynthesis along with its significance.
- Give a number of examples of plants having variegated leaves and tell the students which parts of such leaves give a positive test for the presence of Starch.
- Advise students to read the instructions given for each question very carefully.
- Explain the parts and functions of the eye and ear using charts, models and interactive boards.
- Emphasise on the differences between Plant and Animal Cells.
- Train students to know the location and function of stomata and lenticels.
- Familiarise students with the location and function of the different parts of testis and accessory glands.
- Acquaint students with the hormones secreted by the endocrine glands and the disorders caused due to their Hypo and Hyper secretions.
- Explain the differences between Biodegradable and Non-Biodegradable substances, Antiseptics and Disinfectants and the kind of blood flowing in Pulmonary artery and Pulmonary vein.
- Draw the attention of the students towards the activities of WHO and Red Cross and guide them to express these correctly.



- (ii) Most candidates wrote the incorrect option to answer the question specified in the bracket which clearly implies that the candidates were unaware of the fluid surrounding the organ of Corti.
- (iii) Most candidates answered correctly.
- (iv) Many candidates were unsure of the layer of eyeball which forms the Iris.
- (v) Majority of the candidates wrote an incorrect answer as they were confused with the oxygen content in pulmonary artery and pulmonary vein.
- (g) In sub-parts (i-iv), most of the candidates answered the questions based on the study of a picture on type of pollution, correctly.
- For sub-part (v), only a few candidates wrote the correct answer. Most of them were unsure of the gases causing ozone holes.
- (h) In sub-parts (i) – (iii) & (v), most of the candidates chose the ODD one out from the given terms correctly and named the category to which the others belong appropriately. However, in sub-part(iv), majority of the candidates were unsure of the difference between plant and animal cell.

### MARKING SCHEME

#### Question 1

(a)	(i) Red Cross / Red Cross Society (ii) Hepatic artery/Hepatic Portal Vein (iii) 46 or 23 pairs (iv) Sclera/Sclerotic layer (v) Cuticle/cutin
(b)	(i) A.31 pairs (ii) A. DDT (iii) D. Cornea and Lens (iv) A. Cresol (v) B. Methane/CH <sub>4</sub>
(c)	(i) kill the cells (ii) remove chlorophyll/decolourise the leaf (iii) Iodine/Potassium iodide/KI/I <sub>2</sub> (iv) blue black/blackish blue/dark blue/Indigo (v) yellowish brown/reddish brown/yellow /golden brown
(d)	(i) Cretinism - (b) Hyposecretion of thyroxine (ii) Diabetes insipidus - (d) Hyposecretion of Vasopressin (iii) Exophthalmic Goitre - (g) Hypersecretion of thyroxine



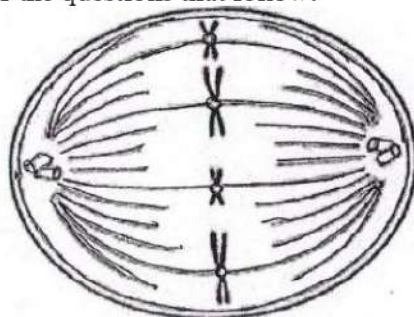
	(iv) Adrenal virilims - (a) Hypersecretion of adrenal cortex
	(v) Dwarfism - (c) Hyposecretion of growth hormones
(e)	(i) Urochrome/Urobilin (ii) Duramater (iii) Hypertonic/Concentrated (iv) Phloem (v) Hydrogen/ H
(f)	(i) Renal artery (ii) Endolymph (iii) Lenticels (iv) Choroid (v) Pulmonary artery
(g)	(i) Air/Gaseous Pollution (ii) Factories / industries / motor vehicles / cars / buses/ burning of garbage / brick kilns/trucks/lorries/Power Plant/oil refineries/burning crop residues/bursting crackers. (iii) Respiratory problems / difficulty in breathing / Asthma / poor visibility / damages lungs / bronchitis/Respiratory inflammation/cough/sneezing/wheezing/eye irritation/allergies/toxic chemical enters food chain/disorders of liver,kidney,lung,hormonal (iv) Use of unleaded petrol / CNG / Chimneys with filters or precipitators / switching off engines when not in use/use of carpool, public transport,planting more trees/regular check up of vehicles (v) Styrofoam / CFCs / Refrigerants / Freons / CCl <sub>4</sub> / HFCs / HCFCs./halons/methyl bromide
(h)	(i) X-rays - water pollutants (ii) Pericardium - parts of artery and vein / blood vessels Lumen - Parts of heart/tissues of heart (iii) Spinal Cord - parts of neuron / nerve cell (iv) Centrosome - parts of plant cell (v) Seminiferous tubules - accessory <b>or</b> reproductive glands of male



## Question 2

- (a) The diagram given below represents a stage during cell division. Study the same and answer the questions that follow:

[5]



- (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:
- (i) Epididymis
  - (ii) Lacrimal gland
  - (iii) Malleus
  - (iv) Hydathodes
  - (v) Pulmonary semilunar valve

[5]





## Comments of Examiners

- (a) (i) Most candidates identified the diagram as that of animal cell and were able to support it with a suitable reason.
- (ii) Majority of the candidates wrote the correct stage of Mitosis. A few candidates were unable to give the pattern of arrangement of Chromosomes.
- (iii) Most candidates named *the type of cell division.....* correctly.
- (iv) Most candidates wrote the stage that comes before the stage shown in the diagram, correctly.
- (v) Most candidates drew the correct diagram. A few candidates, however, drew Anaphase and did not keep the chromosome number constant.
- (b) (i) Majority of the candidates were unable to specify the exact location of Epididymis.
- (ii) Majority of the candidates, instead of writing upper outer corner of the eye, wrote above the eye.
- (iii) Most candidates wrote the exact location of Malleus correctly.
- (iv) The exact location of Hydathodes was written correctly by most candidates.
- (v) Many candidates wrote the location of the pulmonary semilunar valve in between right and left ventricle.

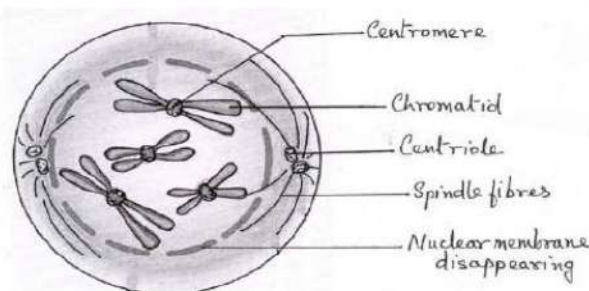
### Suggestions for teachers

- Simplify the textual explanation so that the students are able to write the answers in simple and short sentences.
- Train students to draw labelled diagrams of the phases of mitosis with the required number of Chromosomes. Emphasis must be laid on the nuclear changes during mitosis.
- Clearly explain the location of various structure and organs in a plant and human body.
- Construct similar questions in Unit Tests and Term Examinations for practice and clarify the possible errors.

## MARKING SCHEME

### Question 2

- (a) (i) Plant cell/cell wall present, Aster absent, Aster present Animal cell, Centrioles / Centrosome present
- (ii) Metaphase, Chromosomes are in the equatorial plane.
- (iii) 1. Mitosis  
2. Meiosis
- (iv) Prophase
- (v)



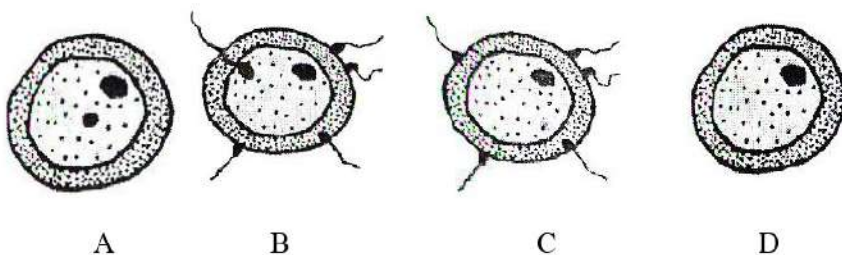


- (b)
- (i) on top of the testis/head, dorsal side, back, rear of testis
  - (ii) upper sideward portion of orbit/upper outer part of eye/upper lateral region of eye
  - (iii) middle ear / between eardrum and incus. /inner surface of eardrum
  - (iv) Tips / margins of leaves / in leaves. /ends or apex of veins/apex of leaves/Epidermis of leaves
  - (v) In the right ventricle at the base of pulmonary artery. /at the opening of Pulmonary Artery

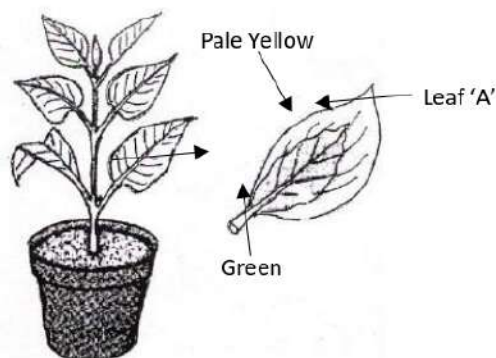
### Question 3

- (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:



- (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 'Implantation' that follows fertilisation?
  - (iii) Mention the chromosome number of the egg and zygote in humans.
  - (iv) Explain the term 'Gestation'. How long does Gestation last in humans?
  - (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 'A' shown in the diagram? Give an example of a plant with variegated leaves.
- (v) Draw a neat labelled diagram of a chloroplast.



## Comments of Examiners

- (a) (i) Most candidates arranged the letters given below each diagram in a logical sequence to show the correct order in the process of fertilisation. However, a few candidates were unsure of the sequence of fertilisation.
- (ii) Majority of the candidate wrote the correct place of fertilisation but, some were unable to explain implantation.
- (iii) Most candidates mentioned the chromosome number of the egg and zygote in humans correctly.
- (iv) Explanation of the term Gestation and how long does it last in humans was written correctly by most of the candidates.
- (v) Most of the candidates drew the correct diagram of a mature human sperm. Some candidates, however, were unable to show a clear differentiation of the three parts.
- (b) (i) Most candidates answered the aspect of photosynthesis being tested through the diagram, correctly.
- (ii) Most candidates wrote the balanced equation representing the process of photosynthesis correctly.
- (iii) Majority of the candidates did not mention that de-starching takes place in leaves and not in the plant.
- (iv) Majority of the candidates did not mention the parts of leaf which give positive and negative test for starch.
- (v) Most candidates drew a correct diagram. A few candidates, however, did not draw a double membrane for chloroplast.

## Suggestions for teachers

- While teaching the concept of fertilisation, lay stress on the number of Chromosomes in gametes and Zygote.
- Setup experiments to enable students to identify the factors necessary for Photosynthesis.
- Make students practise writing a balanced overall chemical equation for Photosynthesis.
- Give adequate practise to the students in drawing the diagram of chloroplast with a double membrane
- Emphasise the significance of de-starching the leaves before beginning any experiment on Photosynthesis.
- Guide students to collect a number of samples of plants having variegated leaves.
- Clearly explain Implantation and Gestation.
- Advise students to read the questions carefully so that they do not miss out on answering certain parts

## MARKING SCHEME

### Question 3

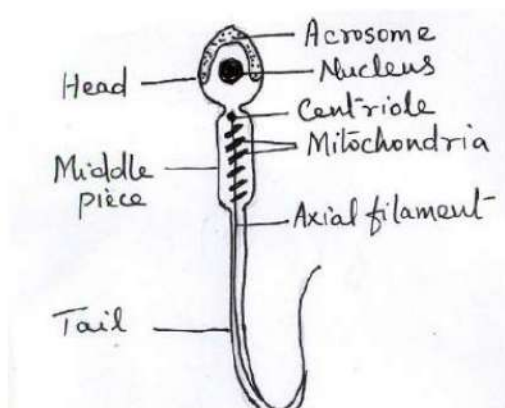
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|-----|--|
| (a) | (i) D C B A / C B A D                                    |
|     | (ii) Oviduct, fixing of the embryo in the wall of uterus |
|     | or   |
|     | Fallopian tube blastocyst in the wall of uterus          |



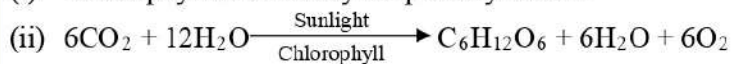
(iii) Egg – 23, Zygote – 46 / 23 pairs

(iv) Full term development of the embryo in the uterus, 280 days / 40 weeks/9 months. It is the period between implantation and birth of baby

(v)



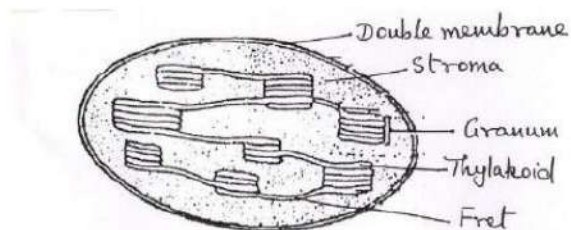
(b) (i) Chlorophyll is necessary for photosynthesis.



(iii) to destarch the leaves.

(iv) Green part – blue black/blackish/dark blue/indigo

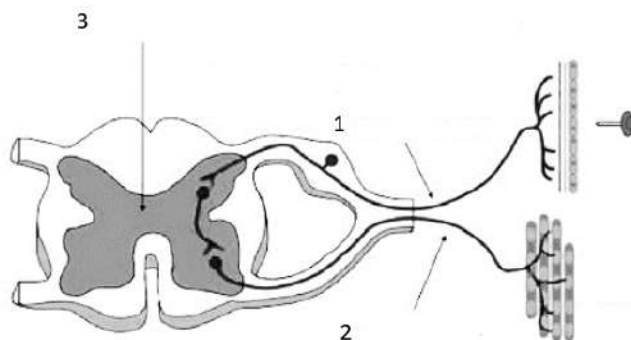
(v) Yellow part – brown/yellowish brown/golden yellow





## Question 4

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



- (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.

### Comments of Examiners

- (a) (i) Most candidates named the phenomenon depicted in the diagram and wrote its definition correctly. A few candidates, however, were unsure of the meaning of the word phenomenon and therefore, were unable to give the correct answer.
- (ii) Majority of the candidates did not know the difference between synapse and synaptic cleft, nerve and neuron.
- (iii) Most of the candidates answered correctly. Some candidates, however, labelled neuron as nerve.
- (iv) Many candidates wrote the location of grey and white matter instead of Cytons and Axons.
- (v) Most candidates wrote two ways by which the spinal cord is protected in our body, correctly.
- (b) In sub-parts(i)-(x), most of the candidates wrote the appropriate *biological or technical terms* for the given statements. However, in sub-parts (i), (viii) and (x), some candidates wrote *Homeostasis* instead of *Osmoregulation*, *Amnion fluid* instead of *Amniotic fluid* and *Birth rate/ Death rate* instead of *Growth Rate of population* respectively.

### Suggestions for teachers

- Give sufficient practice to the students in drawing the nervous path way of Reflex action and to label all the parts.
- Ensure that the students are able to identify the neuron involved in a Reflex action and the location of Synapse.
- Emphasise the arrangement of Cytons and Axons in the Brain and in the Spinal cord.
- Insist upon learning the correct spellings of the biological terms with their correct meaning.
- Encourage students to use biological/technical terms.

## MARKING SCHEME

### Question 4

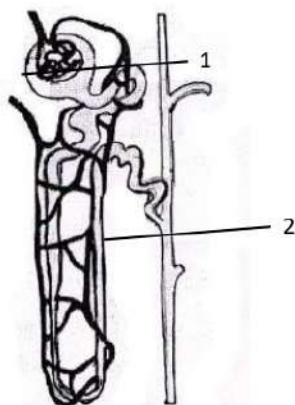
- |     |  |
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| (a) | (i) Reflex action, /Simple reflex/Reflex act<br>It is an automatic, [spontaneous, quick] involuntary response to a stimulus. |
|     | (ii) Synapse   |
|     | (iii) 1. Sensory neuron / afferent fibre/Axon of sensory neuron  |



	<p>2. Motor neuron / efferent fibre/Axon of motor neuron</p> <p>3. Grey matter/central canal</p> <p>(iv) Spinal Cord – Cytons in the inner grey matter and axons in the outer white matter. /Cytons are inside &amp; Axons are outside</p> <p>Brain – Cytons in the outer grey matter and axons in the inner white matter. /Cytons inside, Axons outside</p> <p>(v) Meninges, Cerebrospinal fluid, Vertebral column / backbone.</p>
(b)	<p>(i) Osmoregulation/Osmotic regulation</p> <p>(ii) Tropic hormones</p> <p>(iii) Diffusion</p> <p>(iv) Homozygous</p> <p>(v) Nucleosome</p> <p>(vi) Menarche</p> <p>(vii) Diapedesis</p> <p>(viii) Amniotic fluid</p> <p>(ix) Diastole</p> <p>(x) Growth rate of population</p>

## 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) What is the liquid entering part '1' called?  
Name two substances present in this liquid that are reabsorbed in the tubule.
- (iii) What is the fluid that comes to part '2' called?  
Name the main nitrogenous waste in it.
- (iv) Mention the three main steps involved in the formation of the fluid mentioned in (iii) above.
- (vi) Name the substance which may be present in the fluid in part '2' if a person 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]



## Comments of Examiners

- (a) In sub-parts(i)-(v), most of the candidates wrote correct answers to the questions based on the given diagram of a structure present in a human kidney. However, in sub-part (v), a few candidates wrote *insulin* instead of *glucose*.
- (b) In sub-parts(i)-(v), most of the candidates wrote the correct differentiation between the given pairs based on what is indicated in the brackets. However, in sub-part (iii), some candidates wrote the names of the *structure* instead of writing the names of the *organs* and in sub-part (v), many candidates wrote common words like *Swells* and *Shrinks* instead of *Turgid* and *Flaccid* respectively.

## Suggestions for teachers

- By drawing a simple and clear diagram of Nephron, explain the significance of each part in Urine formation.
- Explain the role of insulin in regulating blood sugar level.
- Give to the students, a list of the substances which are present in the urine of normal person and in the urine of a person suffering from Diabetes mellitus.
- With the help of experiments, teach the concept of endosmosis and exosmosis using hypotonic and hypertonic solution.
- Advise the students to use biological terms –*Turgid* and *Flaccid* when explaining the condition of the cell.
- Give to the students, a list of the biological abbreviations mentioned in the scope of the syllabus.
- Advise students to use words *from* and *to* when structures are involved in transport of certain substances.
- Clearly explain to the students the difference between an organ and a structure.
- Stress upon the form in which glucose is stored in Plants and Animals.

## MARKING SCHEME

### Question 5

- |     |  |
|-----|--|
| (a) | (i) Nephron / Uriniferous tubule / Renal tubule / Kidney tubule  |
|     | (ii) Glomerular filtrate, water / glucose / Sodium Chloride/Na ions/chloride ions/amino acids/ultrafiltrate/Nephric filtrate |
|     | (iii) Urine, Urea  |
|     | (iv) Ultrafiltration, selective reabsorption, tubular secretion, Glomerular filtration.                                      |
|     | (v) Glucose / Sugar / Ketones  |

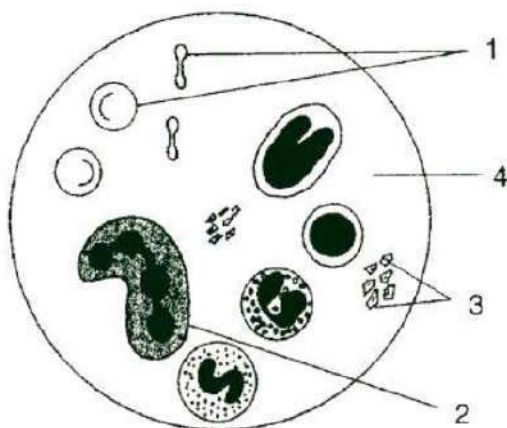


- (b)
- (i) Leaf – Starch, Liver – Glycogen
  - (ii) ATP – Adenosine triphosphate, AIDS – Acquired immune deficiency syndrome.
  - (iii) Testosterone – testis, Oestrogen – Ovary
  - (iv) Ureter – conducts urine from the kidney to the urinary bladder/ transports urine from Renal pelvis to bladder  
Urethra – expulsion of urine from the urinary bladder/ eliminates urine from body/ expels urine and semen.
  - (v) Hypotonic – Turgid / Turgidity  
Hypertonic – Flaccid / Plasmolysed/ Flaccidity

## 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 '1' to '4'.
- (ii) Mention two structural differences between the parts '1' and '2'.
- (iii) Name the soluble protein found in part '4' which forms insoluble threads during clotting of blood.
- (iv) What is the average lifespan of the component numbered '1'?
- (v) Component numbered '1' do not have certain organelles but are very efficient in their function. Explain.



- (b) Give biological explanations for the following: [5]
- Education is very important for population control.
  - The placenta is an important structure for the development of a foetus.
  - All the food chains begin with green plants.
  - Plants growing in fertilized soil are often found to wilt if the soil is not adequately watered.
  - We should not put sharp objects into our ears.

### Comments of Examiners

- (a) In sub-parts(i)-(v), most of the candidates wrote correct answers to the questions based on the given diagram of a *human blood smear*. However, in sub-part (iii), a few candidates named the soluble protein found in part '4' which forms insoluble threads during clotting of blood as *Fibrin* instead of *Fibrinogen*.
- (b) In sub-parts(i)-(v), most of the candidates wrote correct explanations for the given statements. However, in sub-part (iii), a few candidates wrote incorrect explanation for the statement: *All the food chains begin with green plants*. Similarly, in sub-part (iv), many candidates wrote the explanation in terms of *transpiration* instead of *hypertonic medium and ex-osmosis* in response to the statement: *Plants growing in fertilized soil are often found to wilt if the soil is not adequately watered*.

### Suggestions for teachers

- Instruct students practice the diagram of blood cells. Teach the significance of RBCs not having certain organelles.
- Clearly explain the structural differences between RBCs and WBCs.
- Ensure that the students have a general awareness regarding population control.
- Explain the factors causing wilting of plants.
- Advise students to read and understand the statements before answering.
- Related to the statements, give biological explanations to the students.

## MARKING SCHEME

### Question 6

- |     |   |
|-----|---|
| (a) | (i) 1. RBCs / Erythrocytes<br>2. WBC / Leucocytes/named WBC<br>3. Platelets / Thrombocytes<br>4. Plasma |
|     | (ii) 1. RBC   |



	<ul style="list-style-type: none"><li>- Biconcave disc like</li><li>- Nucleus absent</li><li>- Haemoglobin present</li></ul> <p>2. WBC</p> <ul style="list-style-type: none"><li>- Irregular, amoeboid</li><li>- Nucleus present</li><li>- Haemoglobin absent</li></ul> <p>(iii) Fibrinogen</p> <p>(iv) 120 days</p> <p>(v) Absence of nucleus increases the surface area for absorbing more oxygen / more RBCs can be accommodated.</p> <p>Absence of mitochondria means they do not use oxygen for respiration, hence all the transported to tissues.</p> <p>Absence of endoplasmic reticulum increases the flexibility to move through narrow capillaries.</p>
(b)	<p>(i) Desire for a male child, ignorance regarding the functioning of reproductive system, gender inequality, etc can be eliminated with education and population increase can be checked. /to create awareness for birth control measures/vital for growth of nation/Food, water, environmental pollution, lack of job opportunities can be eliminated /to improve quality of life.</p> <p>(ii) - Transport of oxygen / digested foods / hormones / antibodies from maternal blood to foetal blood/nutrients /glucose etc.</p> <ul style="list-style-type: none"><li>- Elimination of nitrogenous wastes / carbon dioxide from foetal blood to maternal blood./urea, uric acid, creatinine</li><li>- Secretes oestrogen and progesterone</li><li>- Acts as a barrier to germs.</li></ul> <p>(iii) All animals / organisms depend on green plant for oxygen and directly or indirectly depend for food.</p> <p>(iv) Soil medium becomes hypertonic. Roots lose water by exosmosis/ plasmolysis and the plants wilt.</p> <p>(v) Can damage eardrum / tympanum leading to deafness.</p>

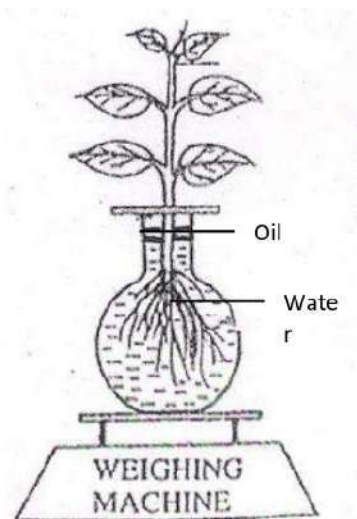


## Question 7

(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) Explain the term 'Guttation'.



- (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]. Answer the following questions: [5]
- Give the phenotype and genotype of the F<sub>1</sub> generation.  
Which type of pollination has occurred to produce F<sub>1</sub> generation?
  - Write the phenotypic ratio of the F<sub>2</sub> generation.
  - Write the possible combinations of the gametes that can be obtained if two F<sub>1</sub> hybrid plants are crossed.
  - State Mendel's law of 'Segregation of Gametes'.
  - What is the scientific name of the plant which Mendel used for his experiments on inheritance?

### Comments of Examiners

- Most candidates wrote the correct answer. Some candidates, however, wrote *Absorption* instead of *Transpiration*.
  - Majority of the candidates were unable to answer this question as they could not relate bright sunlight to loss in weight of the plant due to increased transpiration.
  - Most candidates answered correctly about the change in the level of water on placing experimental setup (a process in plants) in Humid conditions and Windy conditions.
  - Most of the candidates mentioned three adaptations found in plants to overcome the process mentioned in (i) correctly.
  - The term *Guttation* was explained by most of the candidates correctly.
- Many candidates wrote the phenotype and genotype ratios of Monohybrid cross. Some candidates overlooked the second part of this question.
  - Most candidates, instead of writing the phenotypic ratio of F<sub>2</sub> generation, drew the Punnett square and worked out the genotypic ratio.

### Suggestions for teachers

- Advise students to observe the diagrams carefully before answering the questions.
- Ensure that the students have understood the rate of transpiration under various climatic conditions.
- Teach the various adaptations in plants to overcome excessive transpiration.
- Give adequate practice of monohybrid and dihybrid cross and the phenotype and genotype ratios related to F<sub>1</sub> and F<sub>2</sub> generation.
- For better retention, instruct students to write the three laws of inheritance put forth by Mendel.



- (iii) Majority of the candidates could not write the possible combinations of the gametes that can be obtained if two F<sub>1</sub> hybrid plants are crossed.
- (iv) Most candidates stated Mendel's law of 'Segregation of Gametes' correctly.
- (iv) Most of the candidates wrote the correct scientific name of the plant which Mendel used for his experiments on inheritance. However, a few candidates wrote only the generic name.

## MARKING SCHEME

### Question 7

(a)	<p>(i) Absorption of water by roots, Transpiration by leaves. To prevent evaporation of water.</p> <p>(ii) Weight of the plant reduces. Rate of transpiration is more than the rate of absorption of water. /Final weight is less than initial weight because leaves transpire</p> <p>(iii) 1. Remains same 2. Reduces</p> <p>(iv) Sunken stomata, fewer stomata, narrow leaves, Rolled or folded leaves, loss of leaves, leaves modified to spines, thick cuticle on leaves. /small leaves/needle like leaves/hair on leaves/multiple epidermis.</p> <p>(v) Loss of water (as droplets) from the margins / hydathodes of leaves. /apex, tips of leaves.</p>
(b)	<p>(i) Phenotype: All have green, inflated pods. Genotype: GgIi, Cross pollination</p> <p>(vii) 9 : 3 : 3 : 1</p> <p>(viii) GI, Gi, gI, gi</p> <p>(iv) Two members of a pair of factors separate during gamete formation./The two alleles of a trait separate during gamete formation.</p> <p>(v) Pisum Sativum</p>





## GENERAL COMMENTS

### Topics found difficult / confusing by candidates

- Number of Chromosomes in somatic cells and gametes.
- Layers of eyeball and their associated structures.
- Biodegradable and Non-biodegradable substances.
- Antiseptics and Disinfectants.
- Greenhouse gases and gases causing depletion of ozone layer.
- Significance of each step in Starch test of leaf.
- Blood vessels supplying the organs and the kind of blood they carry.
- Difference between Plant cell and Animal cell.
- Internal structure of testis.
- Structures of the male reproductive system.
- Exact location of structures and organs.
- Implantation and Gestation.
- Factors affecting Photosynthesis.
- Placement of Cytons and Axons in brain and spinal cord.
- Nucleosome and Nucleotide.
- Birth rate, Death rate, Growth rate.
- Significance of each part of Nephron in Urine formation.
- Biological abbreviations.
- Efficiency of RBCs in transporting Oxygen to tissues.
- Factors affecting Transpiration
- Monohybrid and Dihybrid Cross.
- Mendel's Laws of Inheritance.

### Suggestions for candidates

- Read the scope and syllabus prescribed for ICSE Biology.
- Revise the topics repeatedly for better understanding of concepts.
- Maintain a list of abbreviations related to the syllabus.
- Learn the keywords/biological terms/ definitions with conceptual clarity.
- Practise drawing neat and labelled diagrams.
- Give importance to biological and technical terms.
- Make the best use of the 15 minutes reading time to understand and assimilate the questions.
- Make your choice of question as per the rubrics and plan and organize your thoughts.
- Select the four questions you know the best in Section II.
- Follow carefully the instructions given for each question.
- Write the correct question number before answering.
- Be methodical and organized while answering.
- Do not separate the subsections of the question.
- Handwriting must be neat and legible.
- Do not attempt more questions than asked for in the question paper.