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. 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

(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

(iv) Adrenal virilism

(v) Dwarfism

(c) Hyposecretion of growth hormone

(d) Hyposecretion of Vasopressin

(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?)

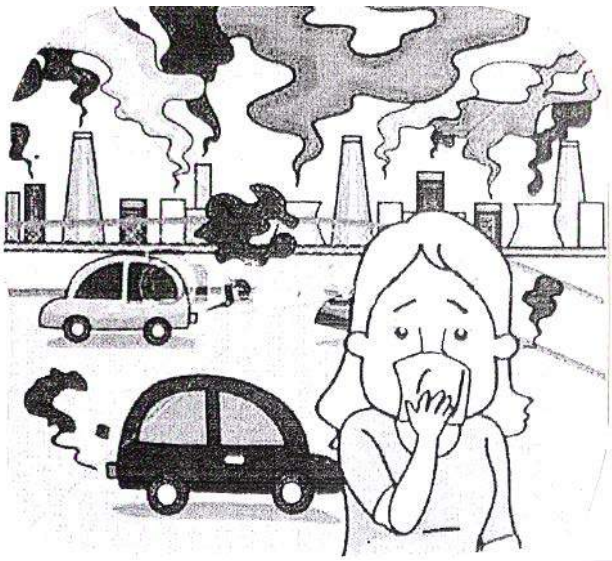
(iii) Lenticels or stomata (Which one remains open always?)

(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** 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) 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

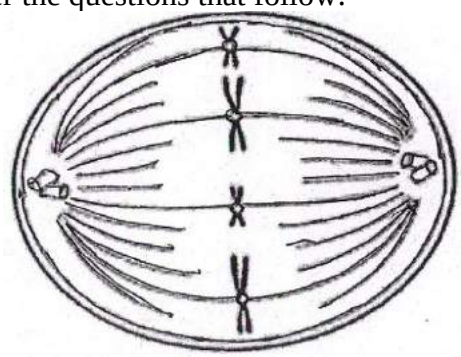
Question 1

(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_4			
(c)	(i)	kill the cells			
	(ii)	remove chlorophyll/decolourise the leaf			
	(iii)	Iodine/Potassium iodide/K1/I_2			
	(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_4 / 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 **or** reproductive glands of male	

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

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

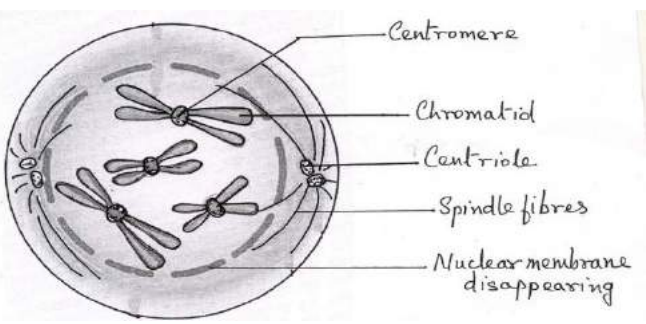
(ii) Metaphase, Chromosomes are in the equatorial plane.

(iii) 1. Mitosis

2. Meosis

(iv) Prophase

(v)

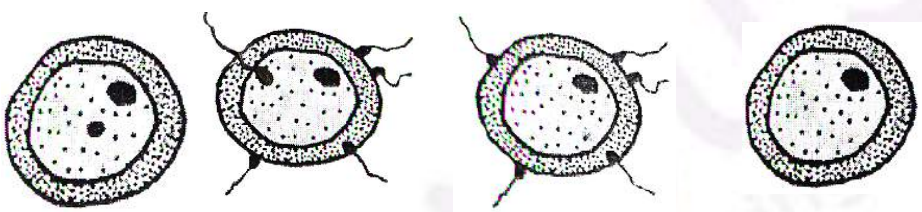


(b)	(i) on top of the testis/head, dorsal ride, back, rear of testis (ii) upper sideward portion of orbit/upper outer part of eye/upper lateral region of eye (iii) middle ear / between eardrum and incus. /inner surface of eardrum (iv) Tips / margins of leaves / in leaves. /ends or apex of veins/apex 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:



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?

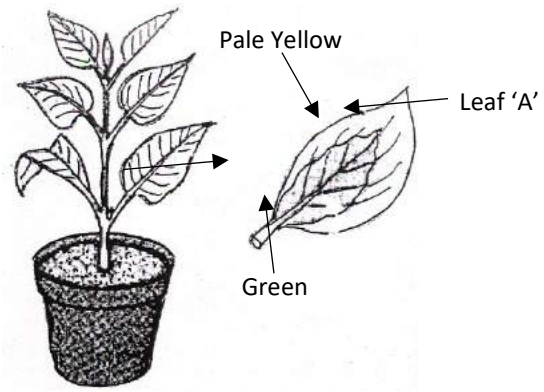
What is 'Implantation' that follows fertilisation?

(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.

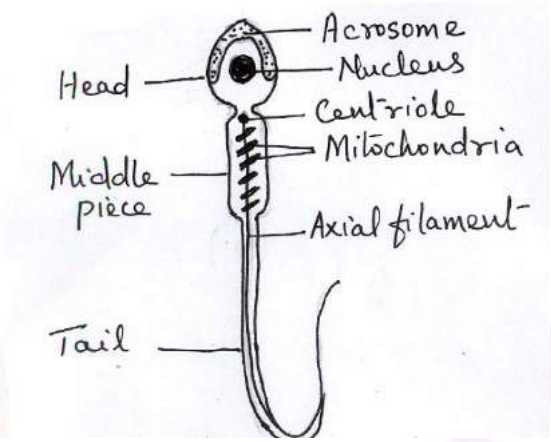
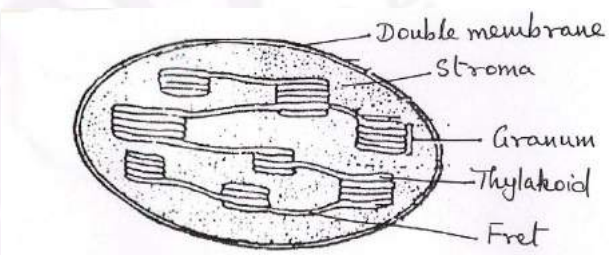
Suggestions for teachers

- 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

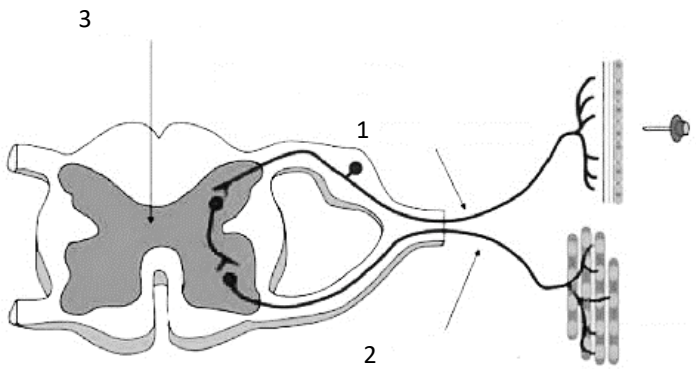
Question 3

(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. (ii) $6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6H_2O + 6O_2$ (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 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.

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

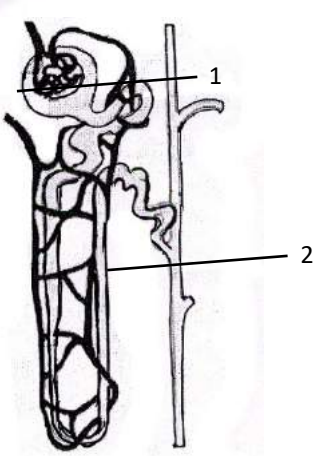
(a)	(i)	Reflex action, /Simple reflex/Reflex act It is an automatic, [spontaneous, quick] involuntary response to a stimulus.
	(ii)	Synapse
	(iii)	1. Sensory neuron / afferent fibre/Axon of sensory neuron

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

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

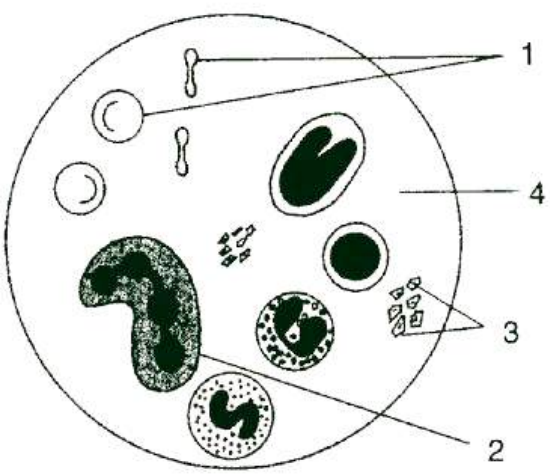
(a)	(i)	Nephron / Uriniferous tubule / Renal tubule / Kidney tubule
	(ii)	Glomerular filtrate, water / glucose / Sodium Chloride/Na ions/chloride ions/amino acids/ultrafiltrate/Nephric filtrate
	(iii)	Urine, Urea
	(iv)	Ultrafiltration, selective reabsorption, tubular secretion, Glomerular filtration.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

(b)	(i)	Leaf – Starch, Liver – Glycogen
	(ii)	ATP – Adeosine 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]

(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.

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

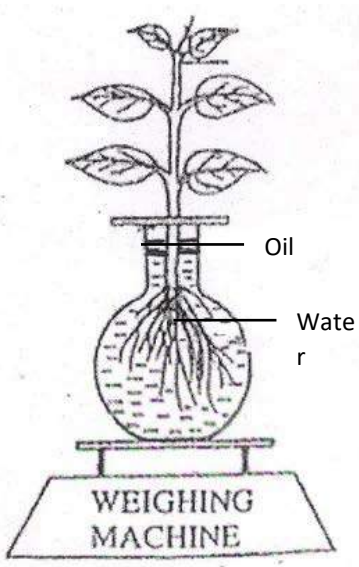
(a)	(i) 1. RBCs / Erythrocytes 2. WBC / Leucocytes/named WBC 3. Platelets / Thrombocytes 4. Plasma (ii) 1. RBC

	- Biconcave disc like - Nucleus absent - Haemoglobin present 2. WBC - Irregular, amoeboid - Nucleus present - Haemoglobin absent (iii) Fibrinogen (iv) 120 days (v) Absence of nucleus increases the surface area for absorbing more oxygen / more RBCs can be accommodated. Absence of mitochondria means they do not use oxygen for respiration, hence all the transported to tissues. Absence of endoplasmic reticulum increases the flexibility to move through narrow capillaries.
(b)	(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. (ii) - Transport of oxygen / digested foods / hormones / antibodies from maternal blood to foetal blood/nutrients /glucose etc. - Elimination of nitrogenous wastes / carbon dioxide from foetal blood to maternal blood./urea, uric acid, creatinine - Secretes oestrogen and progesterone - Acts as a barrier to germs. (iii) All animals / organisms depend on green plant for oxygen and directly or indirectly depend for food. (iv) Soil medium becomes hypertonic. Roots lose water by exosmosis/ plasmolysis and the plants wilt. (v) Can damage eardrum / tympanum leading to deafness.

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]

(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) State Mendel's law of 'Segregation of Gametes'.

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

Comments of Examiners

(a) (i) Most candidates wrote the correct answer. Some candidates, however, wrote *Absorption* instead of *Transpiration.*

(ii) 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.

(iii) 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.

(iv) Most of the candidates mentioned three adaptations found in plants to overcome the process mentioned in (i) correctly.

(v) The term *Guttation* was explained by most of the candidates correctly.

(b) (i) Many candidates wrote the phenotype and genotype ratios of Monohybrid cross. Some candidates overlooked the second part of this question.

(ii) Most candidates, instead of writing the phenotypic ratio of F_2 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_1 and F_2 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_1 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)	(i) Absorption of water by roots, Transpiration by leaves. To prevent evaporation of water. (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 (iii) 1. Remains same 2. Reduces (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. (v) Loss of water (as droplets) from the margins / hydathodes of leaves. /apex, tips of leaves.
(b)	(i) Phenotype: All have green, inflated pods. Genotype: GgIi, Cross pollination (vii) 9 : 3 : 3 : 1 (viii) GI, Gi, gI, gi (iv) Two members of a pair of factors separate during gamete formation./The two alleles of a trait separate during gamate formation. (v) Pisum Sativum

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.