ICSE Board Class X

Biology Board Paper 2019

(Two hours)

General Instructions:
Total Marks: 80

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 the 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 [ ].

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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.

Ans: choroid

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

Ans:Chloro fluoro carbons

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

Ans-umbilical chord

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

Ans: Homologous chromosome

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

Ans: Carbamino hemoglobin

(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.

Ans-The theory of inheritance of acquired characters was proposed By J.B.Lamarck.

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

Ans-The protective sac which develops around the developing embryo is called the amniotic sac

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

Ans-Maintaining balance of the body and coordinating muscular activities is carried out by the Cerebellum.

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

Ans-The kidney is composed of a number of nephrons.

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

Ans- The part of the eye which can be donated from a clinically dead person is the cornea.

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

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

Ans-Indifferent attitude in birth controlling device .Early marriage, illiteracy are some of the causes of high birth rate in India. The people of rural area are unaware of the need of family planning.

(ii) Carbon monoxide is dangerous when inhaled.

Ans- Inhaling too much of carbon monoxide is poisonous.

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

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Ans- In outside soil there is more concentration of solutes due to the presence of fertilizers so water moves from the root hairs cells to the soil through the process of osmosis and root hair becomes flaccid.

(iv) Acid rain is harmful to the environment.

Ans- Acid rain causes damage to building and monument. It increases acidity of soil. It causes neurological diseases.

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

Ans-Green plants and some other organism prepare food in presence of sunlight and carbon dioxide by process of photosynthesis. All animals take food from plants and other animals. All animals depend on plants for food to obtain energy.

(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
Cranial nerves	Testeterone
Leydig Cells	Natural Reflex
Acetylcholine	12 Pairs
Spinal Nerves	Prolactin
Sneezing	Neurotransmitter
	18 pairs
	31Pairs
	Conditioned reflex

Column A	Column B
Cranial nerves	12 pairs
Leydig Cells	Testosterone
Acetylcholine	Neurotransmitter

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Spinal Nerves	31 pairs
Sneezing	Natural reflex

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

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

A. Nerve

B. Vein

C. Artery

D. Capillary

Ans- Artery

(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

Ans - Both X and Y chromosome

(iii) A muscular wall is absent in

A. Capillary

B. Venule

C. Arteriole

D. Vein

Ans- Capillary

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

A. 5th day

B. 28th day

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C. 14th day

D. 1st day

Ans- 14th 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

Ans- Age of Plant

(f) Identify the ODD term in each set and name the CATEGORY in which the remaining of these belong: [5

Example: Glucose, starch, cellulose, calcium

Odd term: Calcium Category: Others are different types of carbohydrates.

i. **Addison's disease, Cushing's Syndrome, Acromegaly, Leukemia**

Ans - Leukimia is a cancer of blood cells while the other three are endocrinal disorder.

ii. **Insulin, Adrenaline, Pepsin, Thyroxine**

Ans- pepsin is not seretedby endocrine glands.

iii. **Axon, Dendron, Photon, Cyton**

Ans- Axon ,Dendron,cyton are part of neuron while photon is a light particle.

iv. **Chicken pox, Colour blindness, Haemophilia, Albinism**

Ans-ColourBlindness, Haemophilia, albenism are genetic disorder while chicken pox is a viral infection.

v. **Polythene bag, Crop residue, Animal waste, Decaying vegetable**

Ans- Only polythene bag is non- biodegradable.

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

(i) ABA –Abcisic acid

(ii) IAA- Indole acetic acid

(iii) ATP- adenosine triphospate

(iv) DNA- Deoxyribonucleic Acid

(v) TSH – Thyroid Stimulating Hormone

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

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(i) Identify the type of pollution.

Ans- Water Pollution

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

Ans- Industrial effluent

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

Ans- Large amount of Nitrates are dissolved in the water from industrial waste . It will contaminate the water and cause serious health hazards.

(iv) State one measure to control this pollution.

Ans- Factories should treat wastes before releasing into water bodies.

(v) What is a 'pollutant'? Explain the term

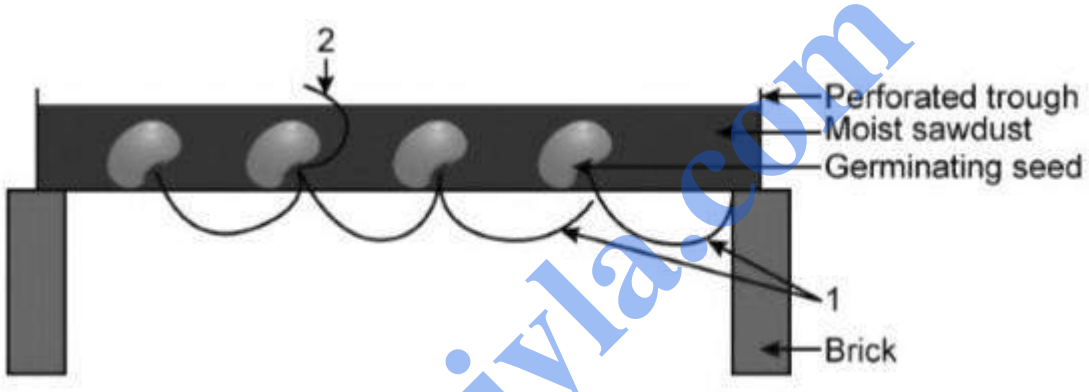
Ans- The substance as certain chemicals or waste that renders the normal properties ofenvironmentarecalledpollutant. They may be air pollutants,Waterpollutant, soil pollutants.

SECTION II (40 Marks)

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

Question 2

a) Given below is an experimental setup to demonstrate a particular tropical movement in germinating seeds. Study the diagram and answer the questions that follows:



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i) Label the parts 1 and 2.

ii) Name the tropical movement shown in part 1.

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

iv) What is thigmotropism? Give one Example.

v) What is meant by ’positive ‘ and ‘negative ‘tropic movement in plants?

Ans-

I) Part 1 is radicle and part 2 isplumule.

ii)Geotropism is shown by Part-1.

iii) Stimulus of gravity and stimulus of water. Water is stronger stimulus than gravity.

iv) The growth and movements of plants in response to touch is called thigmotropism. These types of movements are seen in tendrils.Tendrils of sweat Pea, grapes when comes in contact with any support it coil around it.

v) Positive tropic movement is the movement of a part of a plant when it grows towards a stimulus. Example: growth of stem towards light.

Negative tropic movement is the movement of a part of plant when it grows away from the stimulus. For Example –movement of root away from the light.

b) Mention the exact location of each of the following

i)Testis-

Testis are two oval shaped organs in the male reproductive system. They are contained in a sac of skin called scrotum.

(ii) Incus-

The incus or anvil is a bone in the middle ear and joined to the stapes or stirrup bone.

(iii) Thylakoids-

Chlorophyll is located in a concentrated form in the thylakoid membrane of organelles called chloroplasts.

(iv) Amniotic fluid-

The amniotic fluid is the protective liquid contained by the amniotic sac of a gravid amniote. This fluid serves as a cushion for the growing fetus,

v) Corpus callosum

Located near the center of the brain, the Corpus callosum is the largest bundle of nerve fibers that connects the left and right cerebral hemispheres.

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]

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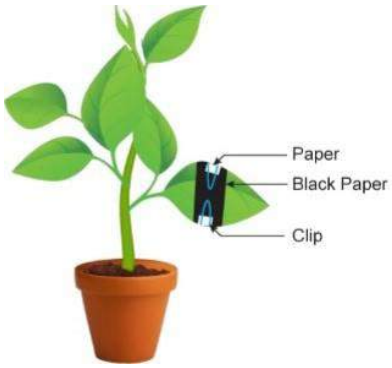

(i) Name the factor studied in the experiment.

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

(iii) Explain the process of photosynthesis.

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

v) Draw a neat labeled diagram of experimental set-up to show that oxygen is released during photosynthesis

Ans-3

a]

i) Light is necessary for photosynthesis.

ii) The leaf turns blue black except in covered region which turn brown in colour. As this covered region did not receive light, photosynthesis did not occur and no starch is formed.

iii) Balanced chemical reaction:

$6co_2 + 12h_2o \xrightarrow{\text{Chlorophyll and sunlight}} c_6H_{12}o_6 + 6o_2 + 6h_2o$

iv) Photosynthesis is a biochemical process by which green plants synthesize their food in presence of carbon dioxide from atmosphere and water from soil inpresence of sunlight. Glucose is synthesized during the process which is converted into starch.

v)Experimental setup to show that oxygen is released during photosynthesis.

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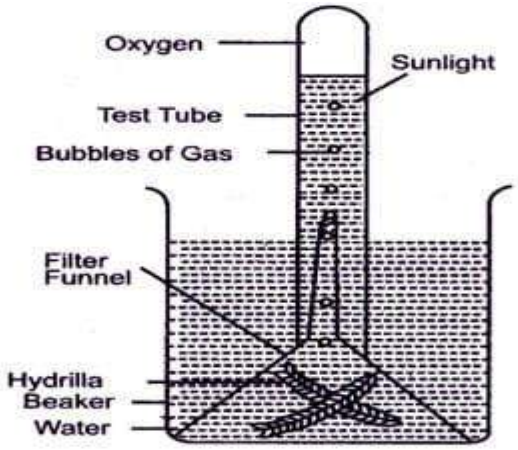

b] State the main function of the following: [5]

i)Medulla Oblongata

ii)Cytokinins

iii)Tears

iv) Coronary Artery

v) Seminal vesicles

Ans:

i) Medulla oblongata-

Ans-The primary function of the medulla oblongata is to control autonomic functions throughout the body**.** It controls functions like heartbeat, breathing and digestion.

(ii) Cytokinins –

Ans-these are plant growth substances that promote cell division and organ formation. It counter act apical dominance.

(iii) Tears

Ans-Tears prevent dryness by coating the surface of the eye, as well as protect it from external irritation. Foreign bodies thatenters the eye are washed out by tears.

(iv) Coronary artery

Ans- Coronary arteries supply blood to the heart muscle.

(v) Seminal vesicles –

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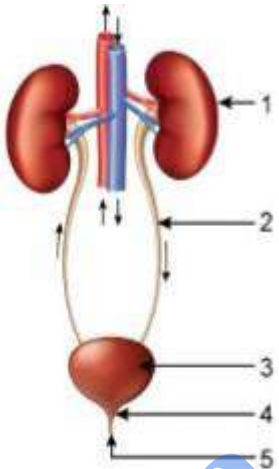
Ans-The seminal vesicle is responsible for producing a milky fluid called semen. . The thick fluid contains a mixture of substances, including citric acid, proteins, sugar fructose and potassium.

Question 4

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



(I)Identify the system.

(ii) Label the parts marked 2 - 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?

vi)Draw a neat labeled diagram showing longitudinal section of part- 1.

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Ans

i)-Humanexcretory system

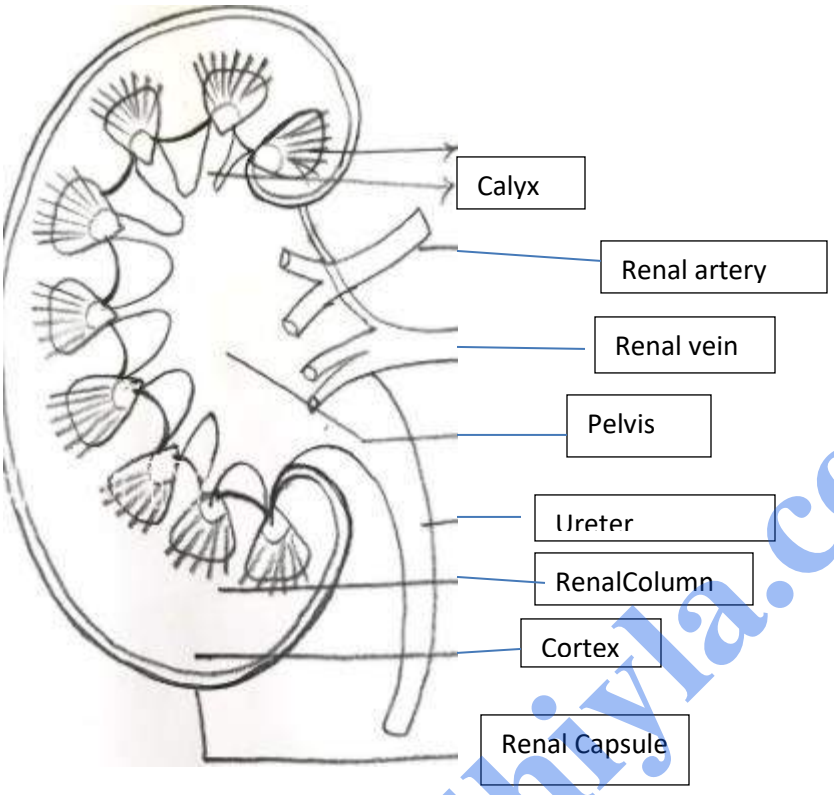
(ii)Part 2 is Ureter and Part 4 is sphincter

(iii)The urethra is a tube responsible for allowing urine to leave the body as it empties from the bladder.

(iv) Nephron is the structural and functional unit of Part-1.

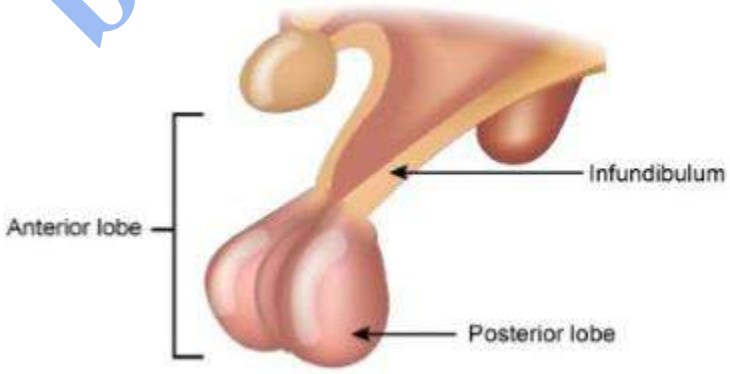
(v) Urine is the fluid that accumulates in part 3. It contains urea and creatinine.

vi) L .S .of Kidney



L. S. of a Kidney

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



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

ii)Why is the above gland referred to as the 'master gland'?

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(iii) Name the hormone which in deficiency causes diabetes insipidus. How does this disorder differ from diabetes mellitus?

(iv) Explain the term 'hormone'. What is the role of tropic hormones in the human body?

(v) Which lobe of the above gland secretes

- **Oxytocin**
- **ACTH**
- **Growth Hormone**

b) Ans-

i) Pitutary Gland. The pituitary is a small gland located below the brain in the skull base below the hypothalamus.

(ii) It is often called the "master gland" because it controls the functions of all other endocrine glands.

Iii)Decrease secretion of Anti Diuretic Hormone causes diabetic Insipidus. Diabetic Mellitus is caused due to deficiency of Insulin hormone.

(iv)A hormone is a biological compound used by multicellular organisms to organize, coordinate, and control the functions of their cells and tissues. A tropic hormone stimulates other endocrine gland to release their hormone.

(v) Oxytocin- Posterior pituitary lobe

ACTH-Anterior pituitary lobe

Growth hormone - Anteriorpituitary lobe

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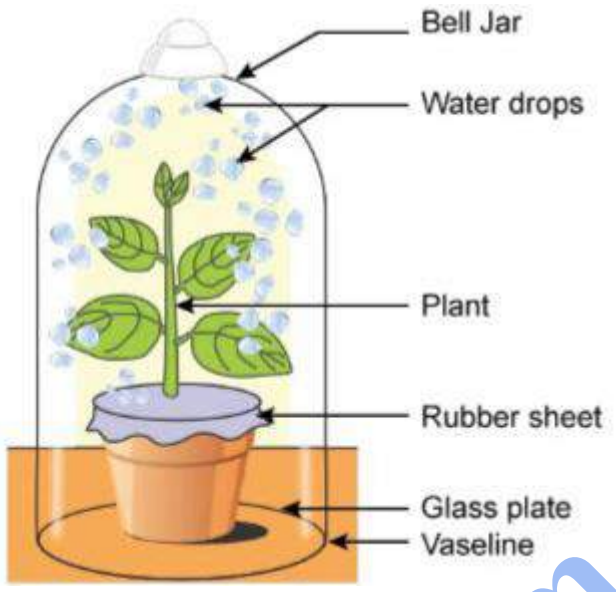
Question 5

(a) Given below is an apparatus which was set up to investigate a physiological process in plants. The set-up 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.

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Ans-

(a)

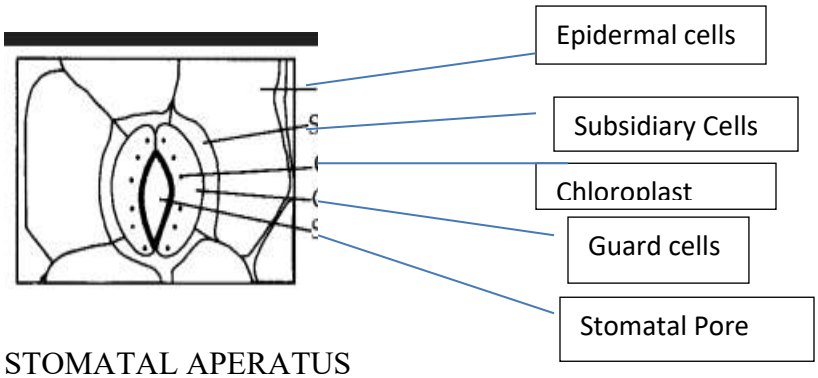
i)Transpiration is taking place. The process by which plant looses water by the process of evaporation through stomata is called transpiration.

(ii) The plastic bag is to prevent the escape of water vapour from the pot.

(iii)Transpiration increases with increase in temperature. Wind increases the rate of transpiration. Sunlight also increases the rate of temperature.

iv)Thick cuticle on leaves reduced the loss of water by transpiration. Narrow leaves reduces the exposed surface area for transpiration. Fewer stomata reduces the rate of transpiration.

(v)



STOMATAL APERATUS

(b) Given below are two stages in the evolution of man. Study them and answer the questions that follow: [5]

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(i) Identify Australopithecus and Neanderthal man from the above pictures
(ii) Mention two characteristic features each for the two stages.
(iii) Who proposed the theory of 'natural selection'?
(iv) Name the organism used as an example to explain 'industrial melanism'.
(v) Give two examples of vestigial organs in humans.

Ans -

(i)A isNeanderthal B is Australopithecus

(ii) Characteristics feature of is Australopithecus:

- Members of Austrapithecus are a combination of human like and apelike traits.
- Distinct Lumbar curve was present in vertebral column.

Characteristics feature of Neanderthal.

- Neanderthals walk upright with bipedal movement..
- The jaw was deep with no chin and skull bones were thick.

(iii)Charle's Darwin proposed the theory of Natural Selection.

(iv)The organism used as an example of Industrial Melanismoccurred in Peppered Moth, Biston Betularia.

(v) Vermiform Appendix , Wisdom Tooth

Question 6

In Mendel's experiments, tall pea plants (T) are dominant over dwarf pea plants (t). [5]

(i)What is the phenotype and genotype of the F1 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 parents are heterozygous for tallness.

iii)What is the phenotypic and Genotypic ratioof above cross in(ii)

iv)State Mendel's Law of Dominance.

(v) What is a dihybrid cross?

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Ans

(a)

(i)Phenotypic Ratio -: tall

genotypic ratio : Tt

	T	t
T	TT	Tt

(ii)

t	Tt	tt

.

(iii) Phenotypic Ratio 3 : 1

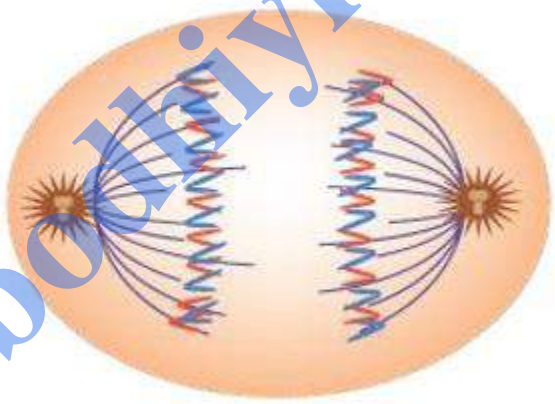
Genotypic Ratio 1: 2 : 1

(iv) Mendel's Law of Dominance.

This when two alternating forms of traits or characters are present are present in an organism only one factor expresses itself in F1 progeny. The factor that expresses itself is called dominant factor and the other factor which remain hidden is called recessive factor.

v) A dihybrid cross is a breeding experiment between parental generation organisms that differ in two traits.

(b) Given below is a diagram representing a stage during mitotic cell division. Study the diagram and answer the following questions. [5]



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(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?

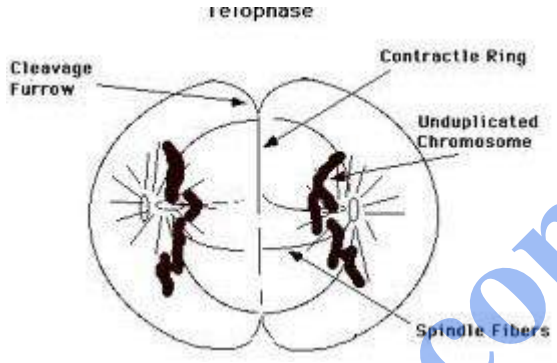
(v) Name the four nitrogenous bases.

Ans- **(b)**

(i)Two sister chromatids of each chromosome separate from each other and move to opposite poles so this is Anaphase.

(ii) This is an Animal cell because centrioles are seen at the opposite poles.

(iii) Telophase is followed by Anaphase.



Telophase

iv) Each daughter cell will have one set of chromosome present in parent cell.

(v)Adenine, Guanine , cytosine ,thymine are four nitrogenous bases.

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Question 7

a) Answer the following questions briefly

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

Ans: The grey matter containing Cytonsis placed in the outer portion and the white matter containing axon id placed in the inner portion in the brain. In the spinal cord grey matter is placed on the inner portion and the white matter is placed on the outer portion.

ii) Which part of the Human ear gives 'Dynamic balance' and 'static balance' to the body?

Ans: The sensory cells in semicircular canal of inner ear gives dynamic equilibrium andthe utriculus and sacculus cells of innerear give static balance.

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

Ans: The movements of muscle fibres of iris control the size of pupil and regulate the amount of light entering the light.

(iv) What is parthenocarpy? Give one example.

Ans: The process of development of fruit without fertilization is called parthenocarpy. In fruits like apple, banana auxin induces fruit formation.

v) Mention any two objectives of 'Swachh Bharat Abhiyaan'.

Ans: Objectives of 'Swachh Bharat Abhiyaan' are -

- The first objective of the mission is to construct individual and community toilets.
- The other objective is to reduce or eliminate open defecation from the country. Open defecation results in the deaths of thousands of children every year due to unhygienic living conditions and diseases.

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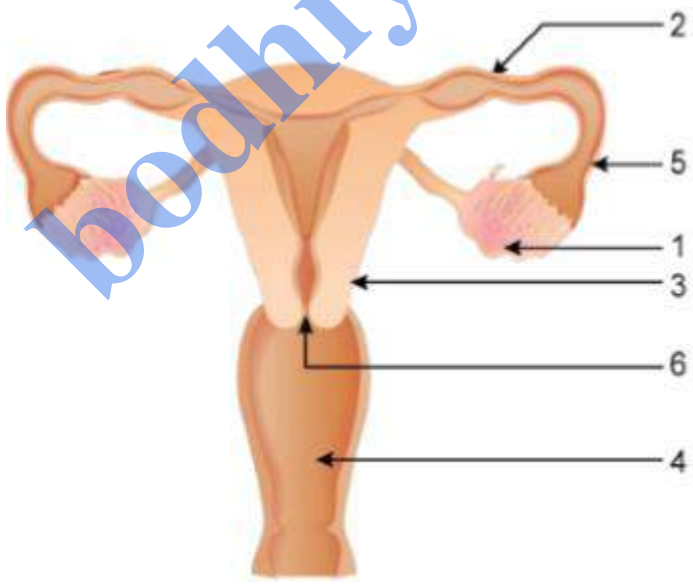
(b) The diagram given below represents a system in the human body. Study the diagram and answer the following questions. [5]



(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

Ans-

(i) Female Reproductive System is shown in the given Diagram.

(ii) Part 5 is Fallopian tube. Part 6 is External os.

(iii)Two hormone secreted by 1 are oestrogen and Progesterone.

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

Process	Number	Name
Fertilization	2	Fallopian Tube
Implantation	3	Uterus

(v) Surgical methods of contraception in male is called Vasectomy and for female it is called tubectomy.

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