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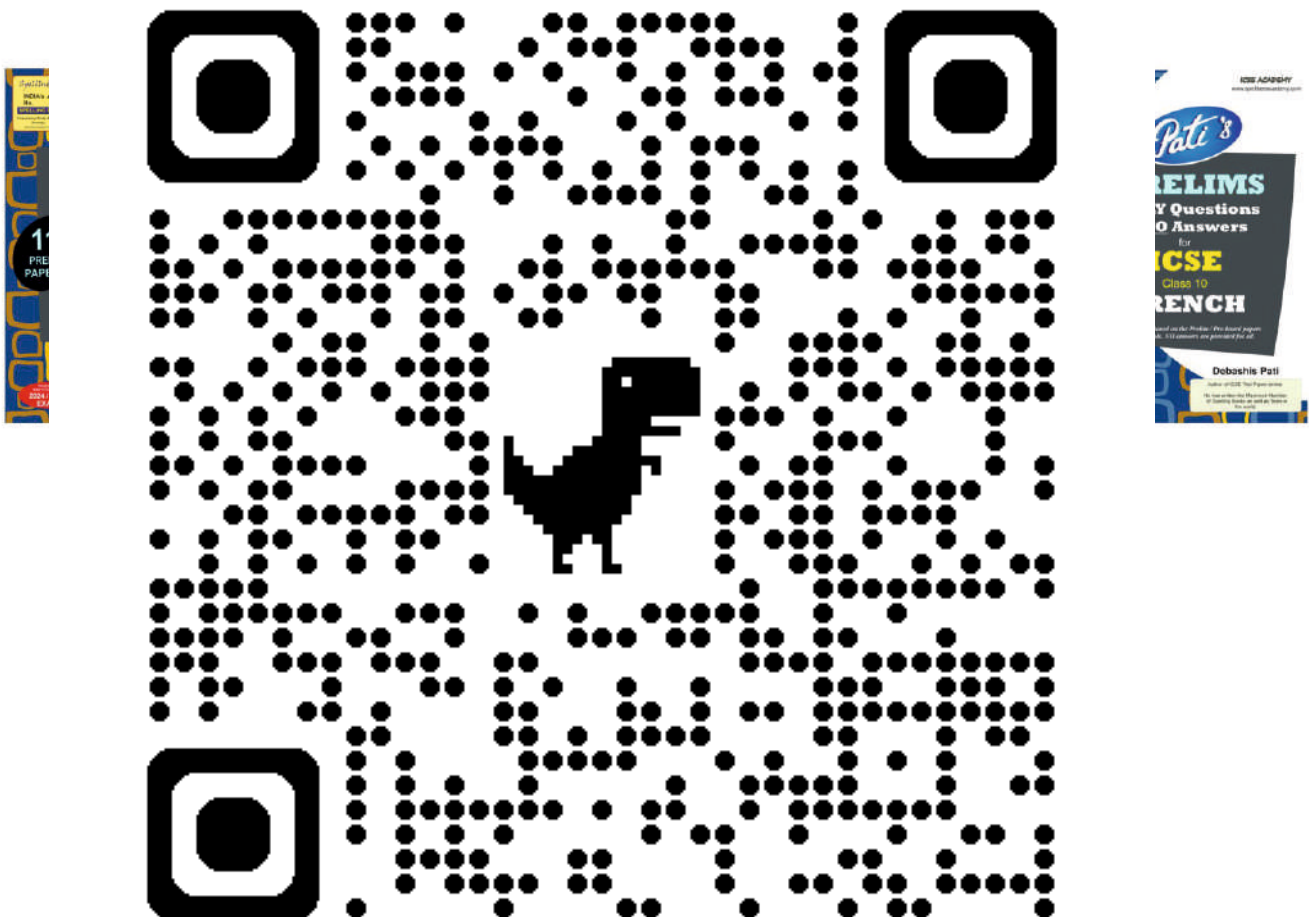
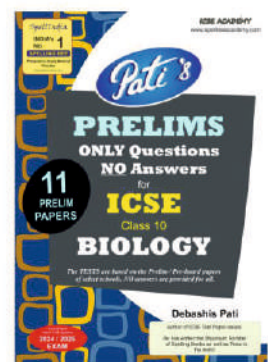
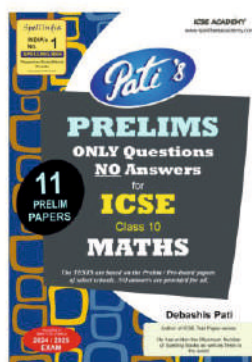
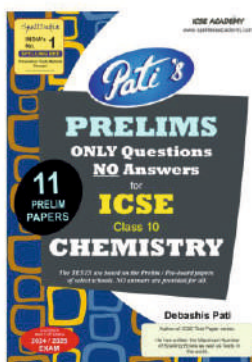
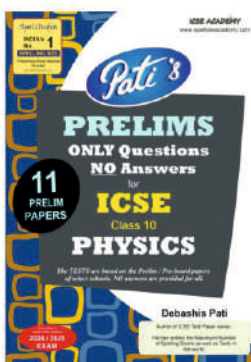
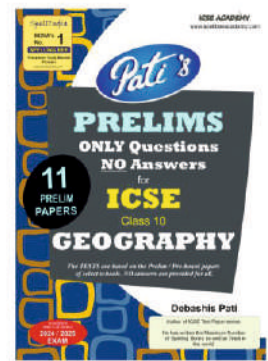
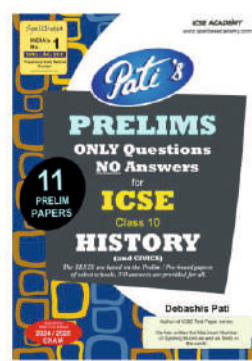
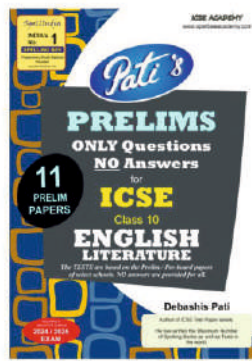
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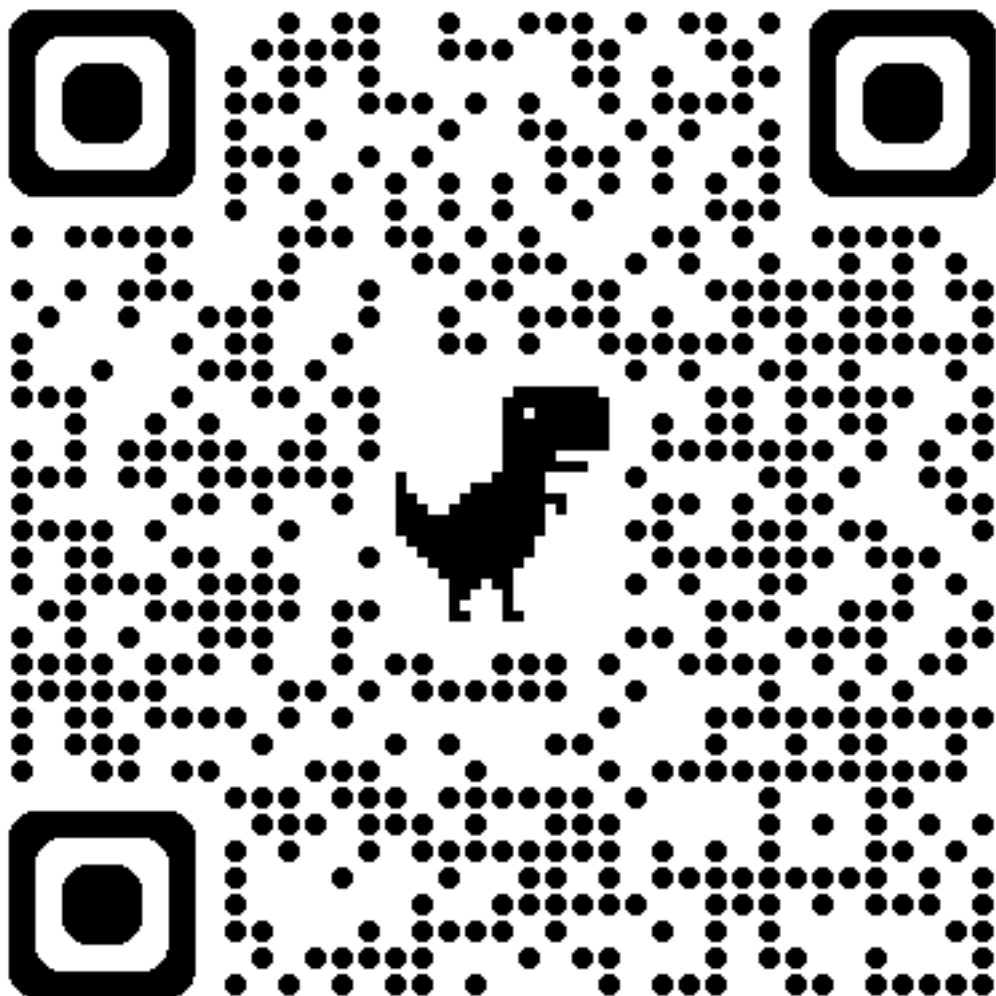




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BIOLOGY
(SCIENCE PAPER – 3)

Maximum Marks: 80

Time allowed: Two hours

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

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

This paper consists of 16 printed pages.

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1

Select the correct answers to the questions from the given options.

[15]

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

- (i) Four friends **P, Q, R** and **S** were discussing the examples of genetic disorders.

The examples they quoted were as follows:

P. Colour blindness and Malaria

Q. Albinism and Cholera

R. Haemophilia and Colour blindness

S. Haemophilia and Albinism

Who gave the correct examples?

(a) P and Q

(b) R and S

(c) P and R

(d) Q and S

- (ii) During the ventricular systole, the atrioventricular valves (P) _____ and the semilunar valves (Q) _____.

(a) P – close and Q – open

(b) P – close and Q – close

(c) P – open and Q – close

(d) P – open and Q – open

(iii) **Assertion (A):** A thick cuticle reduces transpiration by acting as a barrier.

Reason (R): Desert plants have large, thin leaves for transpiration.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (d) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(iv) A sequence of DNA has 300 nitrogenous base pairs, of which 75 are Guanine.

What is the number of Thymine in this sequence?

- (a) 150
- (b) 100
- (c) 50
- (d) 75

(v) **Assertion (A):** Abscisic acid promotes stomatal closure during a drought.

Reason (R): Abscisic acid helps the plant to conserve water during stress.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (d) Both (A) and (R) are true but (R) is not the correct explanation of (A).

- (vi) **Assertion(A):** Leukoderma is the biological term for blood cancer.
Reason(R): An abnormal increase in the number of WBCs causes blood cancer.
- (a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true and (R) is the correct explanation of (A).
(d) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (vii) A health organisation wants to educate the rural audience about population control using visually engaging methods. Which of these would be effective?
- P.** Posters
Q. Loudspeakers
R. Film shows
S. Street plays
- (a) P, R and S
(b) Q, R and S
(c) P, Q and R
(d) P, Q and S
- (viii) A family has a history of colour blindness. During a genetic testing, it was found that the mother is a carrier of colour blindness ($X^C X$) and the father has normal vision (XY). What is the probability of their sons being colour blind?
- (a) 25%
(b) 50%
(c) 75%
(d) 0%

- (ix) Bharat woke up late in the morning and missed the school bus.



This situation stimulated the nerves of the sympathetic system which resulted in:

- (a) Constriction of Coronary arteries
 - (b) Muscle relaxation
 - (c) Decrease in Respiration rate
 - (d) Bronchodilation
- (x) Which is the correct sequence of blood flow in the Pulmonary and Systemic Circulation?
- (a) Right Atrium → Right Ventricle → Lungs → Left Atrium → Left Ventricle → Body tissues
 - (b) Left Ventricle → Left Atrium → Body tissues → Right Atrium → Right Ventricle → Lungs
 - (c) Left Ventricle → Left Atrium → Lungs → Right Ventricle → Right Atrium → Body tissues
 - (d) Right Atrium → Right Ventricle → Body tissues → Left Atrium → Left Ventricle → Lungs

- (xi) Karan was standing on a high stool and cleaning the ceiling fan.



He suddenly loses balance and sustains a head injury. An examination reveals that his pupils have lost the capacity to constrict in bright light. Which structure has been damaged?

- (a) Suspensory ligaments
(b) Medulla oblongata
(c) Eye lens
(d) Eye lid
- (xii) A person suffering from kidney failure has proteins in the urine. What is this condition called?
- (a) Haematuria
(b) Glycosuria
(c) Albuminuria
(d) Anaemia
- (xiii) What does *Swachh Bharat Abhiyan* aim to achieve in India?
- (a) Increase in deforestation to dump waste.
(b) Expansion of landfill areas to accommodate more waste.
(c) Improved sanitation and solid waste management.
(d) Greater industrial waste production.

(xiv) Varun's mother added plenty of salt to the mango pickle she made. This is to:

- A. enhance the colour of the pickle.
- B. inhibit the growth of microorganisms.
- C. increase the nutritional value.
- D. create a hypertonic solution.

(a) A and C

(b) B and C

(c) C and D

(d) B and D

(xv) During which phase of menstrual cycle does the endometrium shed?

(a) Follicular phase

(b) Ovulatory phase

(c) Menstrual phase

(d) Luteal phase

Question 2

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

(a) The tropic movement wherein the tendrils of a pea plant twine around a support.

(b) A defect in our eye in which some parts of the object are in focus while the other parts are blurred.

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

(d) The surgical technique for females that can be used to prevent pregnancy.

(e) The evolutionary process by which new species arise from the existing ones.

- (ii) Given below is the diagram of a human sperm. Read the information below the diagram and fill in the blanks: [5]



Living organisms reproduce to form new individuals of their own kind. This is essential for the survival and continuation of species. Human sperms are microscopic structures that carry genetic material.

The head of the sperm has a cap like organelle called (a) _____
(Lysosome / Acrosome) which produces an enzyme (b) _____
(Hyaluronidase / Amylase) that dissolves the outer layer of the ovum to facilitate fertilisation. The nucleus of the sperm has (c) _____ (23 / 46) chromosomes. The middle piece has (d) _____ (Chloroplast / Mitochondria) to provide energy for the motility of the sperm. (e) _____
(Semen / Hymen) is a mixture of sperms and the fluids produced by the male accessory glands.

- (iii) Choose the **odd** one out from the following terms and name the **category** to which the others belong: [5]
- (a) Auxin, Oxytocin, Gibberellin, Cytokinin
 - (b) Growth Hormone, Vasopressin, Thyroid Stimulating Hormone, Gonadotropic Hormone
 - (c) Urochrome, Urea, Uric acid, Nucleic acid
 - (d) Cervix, Chordae Tendinea, Papillary Muscles, Sinoatrial node
 - (e) Morula, Blastocyst, Oviduct, Foetus

- (iv) Mohit, a 30-year-old man was a software professional leading a sedentary life. [5]
He showed signs of *high blood sugar* during a routine health check-up despite having a normal body weight.



Answer the following:

- (a) The hormonal disorder he is suffering from.
 (b) The hormone responsible for this disorder.
 (c) The organ that secretes this hormone.
 (d) One symptom experienced by Mohit due to this disorder.
 (e) One change in lifestyle to lower the blood sugar level.
- (v) Study the diagram given below and match the structure with its functions: [5]

Example: Pelvis – (f)

Structure	Functions
	(a) Has Malpighian capsules
	(b) Carries oxygenated blood
	(c) Transports urine to urinary bladder
	(d) Has Henle's loops
	(e) Carries deoxygenated blood
	(f) Receives urine which flows into ureter

SECTION B (40 Marks)

(Attempt any four questions from this Section.)

Question 3

- (i) Which is the resting but metabolically active stage of the cell cycle? [1]
- (ii) Given below is the picture of an eagle. [2]



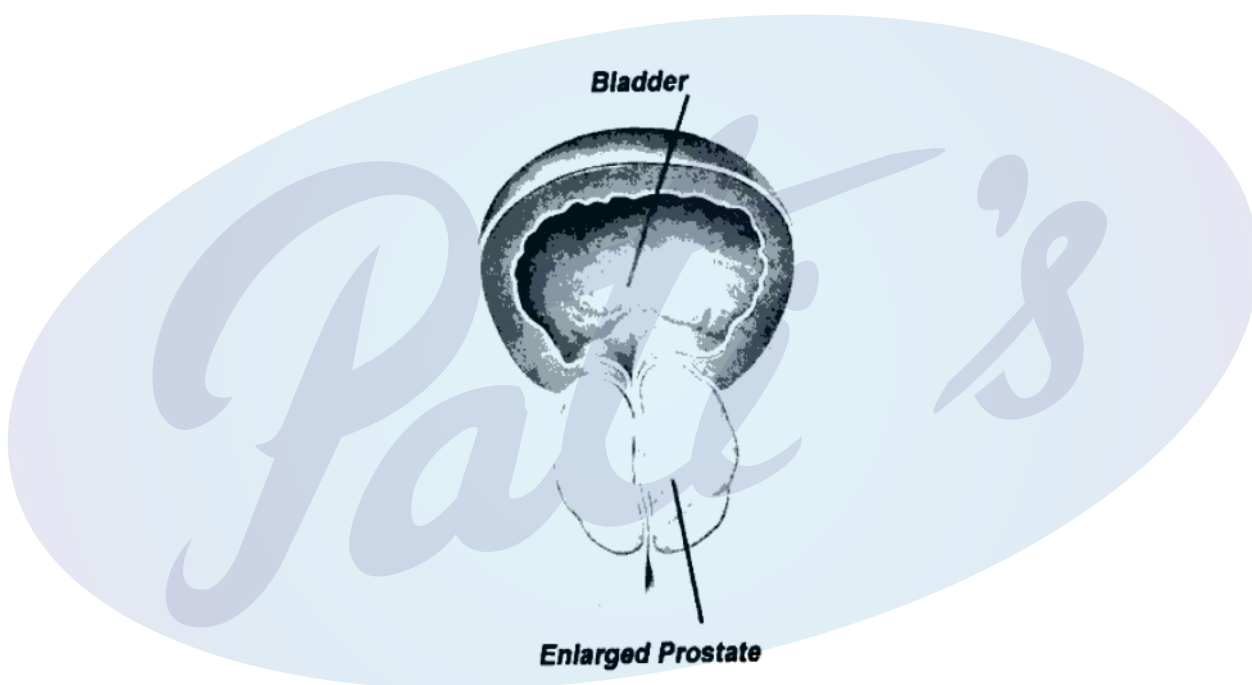
Eagles have binocular vision. What is the advantage of such a vision?

- (iii) Mention the number of *Autosomes* and *Allosomes* in a human body cell. [2]
- (iv) Two well-watered, identical plants were placed in brightly lit rooms at different temperatures – one at 15°C and the other at 38°C. The plant in the warmer room showed wilting by the end of the day. [2]
- (a) Which plant phenomenon resulted in the wilting of the leaves?
- (b) Mention the factor of the phenomenon that is being tested.
- (v) Draw a neat, labelled diagram of an animal cell showing the *Prophase* stage of Mitosis with **four** chromosomes. [3]

Question 4

- (i) What is the scientific name of modern man? [1]
- (ii) How are the Cytons and Axons of neurons arranged in the following? [2]
- (a) Cerebrum
- (b) Spinal Cord

- (iii) (a) Who proposed the theory of Natural Selection? [2]
- (b) Name the organism which was used as an example to explain *Industrial Melanism*.
- (iv) Differentiate between Plasmolysis and Deplasmolysis. [2]
- (v) Akshay's father had a tumour in his prostate gland. His doctor advised him to get it removed surgically. One side effect of the surgery was incontinence of urine, i.e. leakage of urine from the urinary bladder. [3]



- (a) Where is the prostate gland located?
- (b) Why does the prostate gland produce an alkaline secretion?
- (c) Name the structure that regulates the flow of urine from the urinary bladder into the urethra.

Question 5

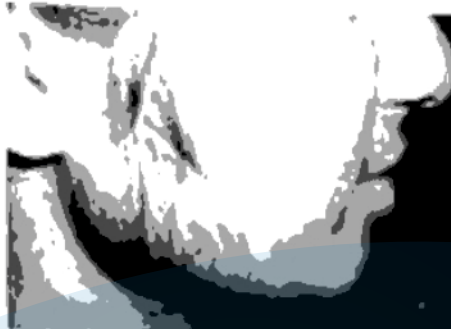
- (i) RBCs do not have nuclei. Discuss its advantage. [1]
- (ii) Arrange the following food chains in a proper sequence. [2]
 - (a) Small fish, Algae, Mosquito larvae, Kingfisher
 - (b) Frog, Snail, Crow, Green leaves
- (iii) A 28-year-old pregnant lady goes to a gynaecologist for a check-up. Her doctor explains that there is normal growth of the foetus and the placenta is functioning well. [2]
 - (a) Mention one function of the placenta.
 - (b) What connects the placenta to the foetus?
- (iv) Mention *any two* secondary sexual characteristics in a 15-year-old boy. [2]
- (v) Tara's grandmother is 70 years old and has a passion for embroidery. She faces difficulty in threading the needle as the eye of the needle appears blurred. The ophthalmologist diagnosed it as an age-related disorder. [3]



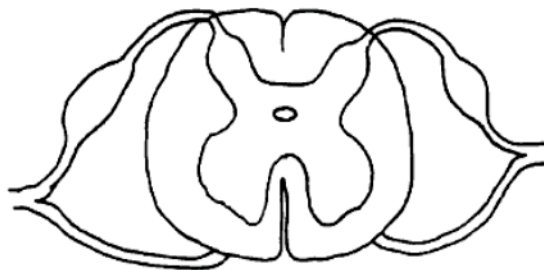
- (a) Name the eye disorder she is suffering from.
- (b) How can the above defect be corrected?
- (c) Where is the image formed in the above disorder?

Question 6

- (i) Explain the term 'Population Density' with reference to human beings. [1]
- (ii) A 17-year-old girl was having irregular menstrual cycle. Her mother took her to their family physician. She was diagnosed with Adrenal Virilism. Study the picture given below and answer the following questions. [2]



- (a) Hypersecretion of which hormone results in Adrenal Virilism in human females?
- (b) Mention one symptom of this disorder.
- (iii) Differentiate between Mitosis in plant cell and animal cell based on Cytokinesis. [2]
- (iv) Sara placed a healthy potted plant in a dark room for 48 hours to perform an experiment on photosynthesis. She plucked one of the leaves and tested it for starch. The leaf did not turn blue-black on adding Iodine solution. [2]
 - (a) Why was the plant placed in the dark for 48 hours?
 - (b) What is the significance of boiling the leaf in alcohol during the starch test?
- (v) Copy the diagram given below. [3]



- (a) Name the structure.
- (b) Label Gray matter and White matter.

Question 7

- (i) Write the overall chemical equation for photosynthesis. [1]
- (ii) Expand the abbreviations: [2]
- (a) NADP
- (b) ADP
- (iii) (a) Explain the term *Synapse*. [2]
- (b) Name the neurotransmitter that allows the transmission of impulses across the synapse.
- (iv) What is the role of the following? [2]
- (a) Leydig cells
- (b) Seminiferous tubules
- (v) "*Vanishing Greenery; A Growing Urban Crisis*" [3]
- In most of our cities, rapid urbanisation has led to a significant decrease in greenery over the past two decades. As the population increased, the demand for housing, roads and commercial buildings grew, leading to clearing of parks, gardens and natural resources. This has contributed to several problems.



- (a) Mention one significant problem caused by the reduction in urban greenery.
- (b) How do green plants contribute to improving the air quality?
- (c) What role can you, as a citizen, play in protecting urban greenery?

Question 8

- (i) Write the term for the pressure exerted by the cell contents on the cell wall. [1]
- (ii) (a) Name the fluid present between the meninges in spinal cord. [2]
(b) What is its function? [2]
- (iii) Given below is the diagram of a turgid plant cell. [2]



Copy the diagram and label Vacuole and Plasma membrane.

- (iv) Select and write the two biodegradable wastes from the given list: [2]

Styrofoam, Metallic cans, Decaying fruits, Plastic bottles, Newspapers

- (v) Rajat Singh was working as a supervisor in a stone quarry where rock, sand and gravel are extracted by techniques like digging, drilling and blasting. As the years rolled by, Rajat started facing a loss in hearing. The high decibel sounds had damaged a part of his internal ear, though the tympanic membrane was intact. [3]



- (a) Give the collective term for the structure located in the internal ear.
- (b) Name the sensory organ in the Cochlea which was damaged for Rajat Singh.
- (c) What kind of pollution do the workers face in the stone quarry?

BIOLOGY
(SCIENCE PAPER – 3)

Maximum Marks: 80

Time allowed: Two hours

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

Instruction for the Supervising Examiner

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This paper consists of 15 printed pages and 1 blank page.

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Turn Over

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1

Select the correct answers to the questions from the given options.

[15]

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

- (i) _____ is the result of inward movement of water molecules.
- (a) Plasmolysis
 - (b) Flaccidity
 - (c) Exosmosis
 - (d) Deplasmolysis
- (ii) Which of the following is an example of a natural reflex?
- (a) Sneezing
 - (b) Applying brakes
 - (c) Giving a hand signal
 - (d) Playing an instrument
- (iii) A newly married couple are expecting their first child. What is the probability of them having a daughter?
- (a) 10%
 - (b) 50%
 - (c) 75%
 - (d) 100%

(iv) **Assertion (A):** Veins starting from the intestines do not open directly into the inferior vena cava.

Reason (R): They unite and enter the liver as hepatic portal vein.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true.
- (d) Both (A) and (R) are false.

(v) The structure absent in a nerve cell is:

- (a) Nucleus
- (b) Centrosome
- (c) Cytoplasm
- (d) Neurilemma

(vi) The number of chromosomes in the somatic cells of a human body **before** mitosis and **after** mitosis is:

- (a) 23, 23
- (b) 26, 46
- (c) 23, 46
- (d) 46, 46

(vii) The inorganic constituent of urine is:

- (a) Ammonia
- (b) Urea
- (c) Creatinine
- (d) Uric acid

(viii) **Assertion (A):** Darwin preferred pea plants for his experiments on genetics as it is a unisexual plant.

Reason (R): Pea plants are normally self-pollinated.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true.
- (d) Both (A) and (R) are false.

(ix) Anup participated in a marathon race and felt dehydrated by the end of the race. The human body has mechanisms to conserve water and prevent dehydration. Which part of the *nephron* is primarily responsible for the reabsorption of water to prevent dehydration?

1. Glomerulus
2. Proximal Convoluted Tubule
3. Loop of Henle
4. Distal Convoluted Tubule

- (a) 3
- (b) 2 and 3
- (c) 1, 2 and 3
- (d) 2, 3 and 4

(x) Which of the following process occurs only in meiosis and **NOT** in mitosis:

- (a) Chromosome duplication
- (b) Crossing over
- (c) Cytokinesis
- (d) Chromosome alignment

(xi) **Assertion (A):** Blood flows from the left atrium to the left ventricle of the heart.

Reason (R): The tricuspid valve separates the left atrium from the left ventricle.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true.
- (d) Both (A) and (R) are false.

(xii) Which adaptation is **NOT** associated with desert plants to minimise water loss through transpiration?

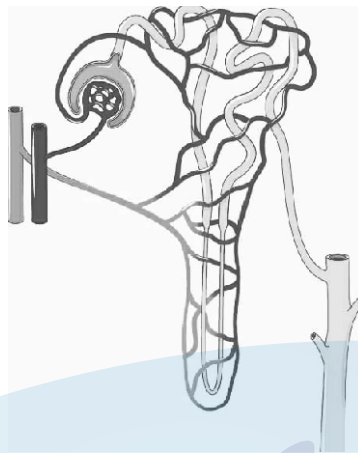
- (a) Reduced number of stomata
- (b) Thick, waxy cuticle
- (c) Deep root systems
- (d) Increased leaf surface area

(xiii) **Assertion (A):** Spraying of pesticides and insecticides can cause water pollution.

Reason (R): Pesticides and insecticides are non-biodegradable agricultural wastes.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true.
- (d) Both (A) and (R) are false.

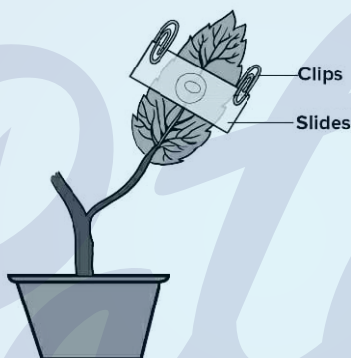
- (xiv) The diagram given below represents a nephron. Ultrafiltration of blood occurs in:



- (a) Bowman's capsule
(b) Glomerulus
(c) Proximal Convoluted Tubule
(d) Loop of Henle
- (xv) Which of the following statements are correct?
- P. Night blindness is caused by the deficiency of Vitamin A.
Q. Utriculus gives dynamic balance to the body.
R. Neuron is a single cell.
S. Fossil fuels are inexhaustible sources of energy.
- (a) Q and S
(b) R and S
(c) P and Q
(d) P and R

Question 2

- (i) Name the following: [5]
- (a) The endocrinal cells which secrete testosterone.
 - (b) The fluid which surrounds the developing embryo.
 - (c) A national campaign in India which aims to eliminate open defecation.
 - (d) Hormone responsible for the bending of a plant shoot towards light.
 - (e) The sensory organ present in the Cochlea for hearing.
- (ii) Given below is an experiment to demonstrate the magnitude of transpiration in a dicot leaf. Read the information given below and fill in the blanks. [5]



Transpiration is the process of loss of water as water vapour from the aerial parts of the plant. It is the essential driving force for the ascent of sap. Less than 1% of the water absorbed by the roots is used in photosynthesis and plant growth. The rest of the water is lost during transpiration.

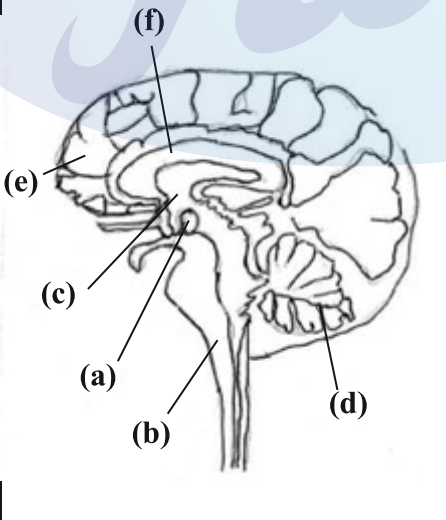
Pieces of dried (a) _____ paper are fixed to the two surfaces of a leaf. The leaf should remain attached to the plant. The plant is exposed to bright sunlight for a few hours. The colour of the paper on the lower surface of the leaf turns (b) _____ faster than the one on the upper surface. This proves that more (c) _____ occurs from the (d) _____ surface of the leaf as it has a greater number of (e) _____.

(iii) Arrange the terms in each group in the correct order. Write them in a logical sequence beginning with the term that is **underlined>**. [5]

- (a) Follicular phase, Luteal phase, Menstrual phase, Ovulatory phase
- (b) Oval window, Auditory canal, Cochlea, Ear ossicles
- (c) Retina, Eyeball, Sclera, Choroid
- (d) Arterioles, Vein, Artery, Capillaries
- (e) Parturition, Implantation, Ovulation, Fertilisation

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

Example: (f) – 6. Transfer information from one cerebral hemisphere to another.

Vertical section of Human Brain	Functions
	<ol style="list-style-type: none"> 1. Seat of intelligence. 2. Maintain body balance. 3. Controls the activities of the internal organs. 4. Relays pain and pressure impulse to cerebrum 5. Controls body temperature and pituitary. 6. Transfer information from one cerebral hemisphere to another.

- (v) Read the explanations given below and name the structures: [5]

Example: *A cord that connects the placenta with the foetus.*

Answer: *Umbilical cord*

- (a) The fibres which hold the lens of the eye in position.
- (b) The cells of the islets of Langerhans that secrete the hormone glucagon.
- (c) The part of the chloroplast where the light independent phase occurs.
- (d) Cap like structure seen around the head of the human sperm.
- (e) The glands located at the upper sideward portion of the orbit of eye.

SECTION B (40 Marks)

(Attempt any four questions from this Section.)

Question 3

- (i) *Ram has protruding eyes and a high metabolic rate.* [1]
Name the hormone responsible for this condition.
- (ii) What are the two hormones secreted by corpus luteum? [2]
- (iii) What are phytohormones? Give an example of the growth retarding hormone. [2]
- (iv) Distinguish between *stoma* and *stroma*. [2]

- (v) Navya is a high school biology student who recently visited a local farm as part of a school project. She observed water droplets on the leaves of certain plants early in the morning as shown in the figure. [3]



- (a) Name the process observed.
- (b) Explain the process mentioned in (a).
- (c) Give the reason for the occurrence of the above-mentioned process.

Question 4

- (i) Explain the term Gestation. [1]
- (ii) Expand the following abbreviations: [2]
- (a) ACTH
- (b) ABA
- (iii) A basement godown is stocked with bags of food grains. It is observed that the walls of the godown cracked after being flooded with rain water. Explain the phenomenon. [2]
- (iv) Name the compound formed when Haemoglobin combines with: [2]
- (a) Carbon monoxide
- (b) Oxygen

- (v) The Amazon rain forest is referred to as the 'Lungs of the Earth'. It plays an important role in climate regulation through photosynthesis. However, this delicate ecosystem is facing threats from deforestation, climate change and human encroachment which can lead to irreversible environmental consequences. [3]



- (a) How does photosynthesis contribute to the Amazon rain forests' reputation as the 'Lungs of the Earth'?
- (b) In what way is the environment affected by deforestation?
- (c) Name the pigment that captures the light energy during photosynthesis.

Question 5

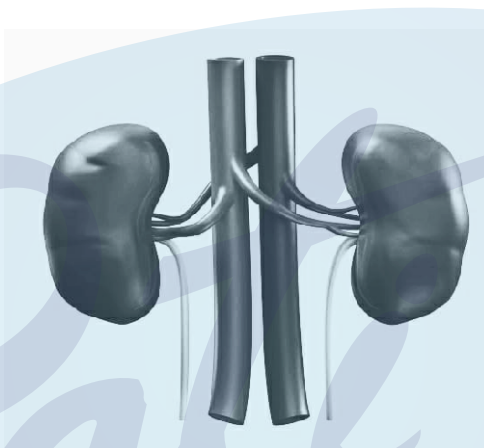
- (i) Ravi cuts his finger while chopping vegetables. The bleeding from the injury did not stop immediately. What kind of genetic disorder is he suffering from? [1]



- (ii) Given below is a set of terms. [2]

Medullary Sheath, Myelin Sheath, Dendron, Meninges, Nissl's granules

- (a) Choose the odd term from the above list.
- (b) Mention the category to which the other terms belong.
- (iii) Human kidney is a complex organ. Kidneys receive blood through blood vessels which directly branch from the Aorta. Inside each kidney are tiny functional units which filter the blood. [2]



- (a) Name the blood vessels that supply blood to the kidneys.
- (b) Which are the functional units that filter the blood?
- (iv) Divya performed an experiment on photosynthesis. At the end of the experiment, she tested the experimental leaf for the presence of starch. During the starch test she first boiled the leaf in water and then in methylated spirit. [2]
- (a) Why did she boil the leaf in water?
- (b) Mention the reason why she then boiled the leaf in methylated spirit.
- (v) Draw a neat, labelled diagram of a stomatal apparatus. [3]

Question 6

- (i) State the overall chemical equation for photosynthesis. [1]
- (ii) Name the structure responsible for each of the following: [2]
- (a) conversion of mechanical sound waves to sound vibrations in the human ear.
 - (b) maintaining equal air pressure on either side of the tympanum.
- (iii) Given below are two statements which are incorrect. Rewrite the correct statements. [2]
- (a) Mendel proposed the theory of 'Use and Disuse' of organs.
 - (b) Meningitis is the inflammation of pericardium.
- (iv) A colourblind child is born to a normal couple. [2]
- (a) Work out a cross to show how it is possible.
 - (b) Mention the sex of this child.
- (v) *Mrs. Lata Mohan delivered twins – Lalit and Leela in the year 2014. The twins were not of the same gender but were born on the same day and around the same time.* [3]
- (a) What kind of twins are Lalit and Leela?
 - (b) Are they monozygotic or dizygotic twins?
 - (c) Mention the sex chromosomes in each of the body cells of Lalit and Leela.

Question 7

- (i) Name the inner lining of the uterus. [1]
- (ii) Based on the image of the Neanderthal Man given below, describe *any two* characteristic features of this human species. [2]



- (iii) State the **location** and **function** of the **prostate gland** present in the male reproductive system. [2]
- (iv) Viplav is a photographer. He finds that his vision gets blurred. This happens when he goes from taking pictures of faraway objects to reading text on his camera screen. He recalls learning about certain defects of the eyes during his school days. [2]



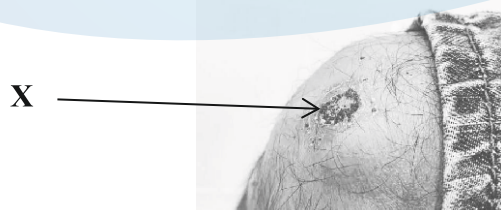
- (a) Name the defect of the eyes which Viplav is suffering from.
- (b) Mention the type of lens that can be used to correct the above defect.
- (v) Draw a neat labelled diagram of a nucleotide. [3]

Question 8

- (i) Explain the process of Phagocytosis. [1]
- (ii) Give *two* examples of radiation pollutants. [2]
- (iii) The need to limit the size of the family is more vital today than ever before. Give *two* reasons. [2]
- (iv) The picture given below shows the athletes lined up at the starting line. The countdown begins and all are focused and alert waiting for the gunshot. [2]



- (a) Which hormone prepares the body in such a situation given above?
- (b) Name the endocrine gland that secretes the hormone mentioned in (a).
- (v) *Madhu fell down while playing in the school playground and injured her knee. There was bleeding from the injured part but after some time a brown thick layer was formed on the injury to stop the bleeding.* [3]



- (a) Name the solid structure labelled X that is formed on the injury.
- (b) What is the enzyme that initiates the formation of X?
- (c) Which mineral element is essential for the formation of X?

BIOLOGY
(SCIENCE PAPER – 3)

Maximum Marks: 80

Time allowed: Two hours

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

Instruction for the Supervising Examiner

Kindly read aloud the Instructions given above to all the candidates present in the Examination Hall.

This paper consists of 16 printed pages.

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Turn Over

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1

Select the correct answers to the questions from the given options.

[15]

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

- (i) The number of live births per thousand people per year is called:
- (a) Mortality
 - (b) Population density
 - (c) Population growth rate
 - (d) Natality
- (ii) The structure that lies at the junction of the choroid and the iris and is itself a part of the choroid is called:
- (a) Ciliary body
 - (b) Suspensory ligament
 - (c) Pupil
 - (d) Lens
- (iii) **Assertion (A):** Seminal vesicles pour an alkaline secretion into the semen as it passes through the ureter.

Reason (R): The female vagina is acidic and needs to be neutralized for sperm survival.

- (a) (A) is true and (R) is false.
- (b) (A) is false and (R) is true.
- (c) Both (A) and (R) are true.
- (d) Both (A) and (R) are false.

- (iv) The hormone that induces vigorous contractions of the uterus in a pregnant mother is:
- (a) Oestrogen
 - (b) Prolactin
 - (c) Oxytocin
 - (d) Progesterone
- (v) A scientist wanted to conduct a genetic experiment on mice. He cut the tails of all the mice and made them reproduce. What will be the phenotype of the offsprings?
- (a) All the offsprings will be tailless.
 - (b) There will be a mix of tailed and tailless offsprings.
 - (c) All the offsprings will have tails.
 - (d) Tail of the offsprings cannot be predicted.
- (vi) **Assertion (A):** A turgid plant cell is in a balanced state.
Reason (R): In a turgid cell, turgor pressure and wall pressure are equal and in the same direction.
- (a) (A) is true and (R) is false.
 - (b) (A) is false and (R) is true.
 - (c) Both (A) and (R) are true.
 - (d) Both (A) and (R) are false.

- (vii) The optimum temperature for photosynthesis is:
- (a) 10 – 15°C
 - (b) 60 – 65°C
 - (c) 40 – 45°C
 - (d) 25 – 35°C
- (viii) Ajay and Vijay are siblings. Ajay can roll his tongue while Vijay cannot. What is the genotype of their parents?
- (a) Both the parents are homozygous dominant.
 - (b) Both the parents are homozygous recessive.
 - (c) One parent is homozygous dominant, and the other is homozygous recessive.
 - (d) Both the parents are heterozygous dominant.
- (ix) **Assertion (A):** Deficiency of Antidiuretic hormone causes an increase in urination.
- Reason (R):** Antidiuretic hormone acts on the kidney to reabsorb water from the kidney tubules.
- (a) (A) is true and (R) is false.
 - (b) (A) is false and (R) is true.
 - (c) Both (A) and (R) are true.
 - (d) Both (A) and (R) are false.

- (x) A phase of cell division where the spindle fibres disappear is:
- (a) Telophase
 - (b) Prophase
 - (c) Metaphase
 - (d) Anaphase
- (xi) **Assertion(A):** Arachnoid layer helps in speeding up the transmission of nerve impulses along the axons.
- Reason(R):** Axon endings at the synapse secrete acetylene.
- (a) (A) is true and (R) is false.
 - (b) (A) is false and (R) is true.
 - (c) Both (A) and (R) are true.
 - (d) Both (A) and (R) are false.
- (xii) Many nuclear power plants are constructed near water sources. They use water for cooling their machinery and release it back into the water stream. Identify the kind of pollution caused.
- (a) Radiation pollution
 - (b) Water pollution
 - (c) Industrial pollution
 - (d) Thermal pollution

(xiii)



Owls are nocturnal animals. They are active at night and hunt small animals for food. Owls have large eyes and can see well at night. This is due to:

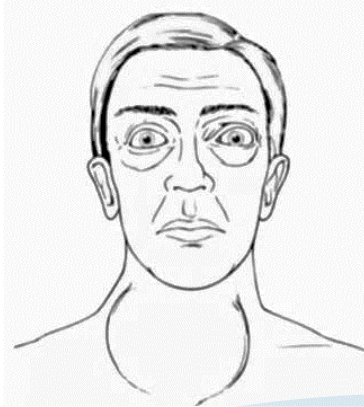
- (a) Cones and Rhodopsin
 - (b) Rods and Iodopsin
 - (c) Rods and Rhodopsin
 - (d) Cones and Iodopsin
- (xiv) Sunil tried to match the tropic movements in plants with the stimulus they respond to. The tabulation is given below:

	Tropism	Stimulus
P	Thigmotropism	Touch
Q	Geotropism	Water
R	Chemotropism	Chemicals
S	Phototropism	Gravity

Identify the correct pair:

- (a) P and R
- (b) Q and S
- (c) R and S
- (d) P and S

- (xv) Observe the following picture, identify the *defect* and the cause of the defect.

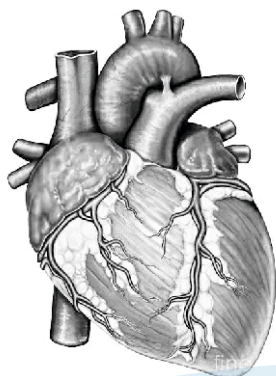


- (a) Simple goitre, under secretion of thyroxine.
- (b) Ex-ophthalmic goitre, over secretion of thyroxine.
- (c) Simple goitre, over secretion of thyroxine.
- (d) Ex-ophthalmic goitre, under secretion of thyroxine.

Question 2

- (i) Name the following: [5]
- (a) The fully developed part of the ovary containing a mature ovum.
 - (b) A waxy layer on the upper epidermis of leaves meant to reduce Transpiration.
 - (c) The ear ossicle which opens into the oval window of Cochlea.
 - (d) The physiological process which is the starting point of all food chains.
 - (e) An insect which is a classic example of natural selection due to industrial melanism.

- (ii) Given below is the diagram of a human heart. Read the information below the diagram and fill in the blanks: [5]



The human heart pumps blood throughout the body. It is the size of a large fist. The heart is located between the lungs in the thoracic cavity. It has four chambers. The heart functions all through the lifespan of a person and is responsible for the survival of the person.

The heart is enclosed by a membrane called (a) _____. The ventricles give rise to two large blood vessels called (b) _____ and (c) _____. The flaps of the cuspid valves are kept in position by (d) _____. (e) _____ arteries supply oxygenated blood to the walls of the heart.

- (iii) Arrange the terms in each group in the correct order. Write them in a logical sequence beginning with the term that is **underlined**. [5]
- (a) Palisade cells, Cuticle, Upper epidermis, Spongy cells.
 - (b) Hepatic portal vein, Stomach, Hepatic vein, Liver.
 - (c) Cyton, Dendrites, Synaptic cleft, Axon endings.
 - (d) Insulin release, High blood sugar, Lowers blood sugar, Stimulates glucose uptake from blood.
 - (e) Sperm duct, Seminiferous tubule, Epididymis, Efferent ducts.

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

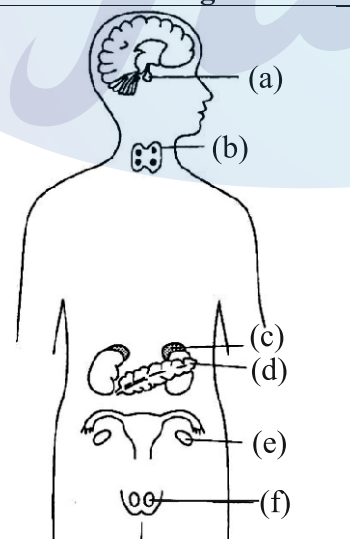
Example: The tubules which produce sperms.

Answer: Seminiferous tubules

- (a) The canal through which the testes descend down into the scrotum just before the birth of a male baby.
- (b) The part of the brain that regulates the peristaltic movement of the alimentary canal.
- (c) A structure that collects the soundwaves and conducts them through the external auditory canal.
- (d) The point of attachment of two chromatids of a chromosome.
- (e) Regulation of the opening and closing of stomata.

(v) Given below is an outline of the human body showing the important endocrine glands. Match the glands marked (a) to (e) with their correct functions: [5]

Example: (f) – 6. Secretes Testosterone.

Endocrine glands	Functions
	<ol style="list-style-type: none"> 1. Prepares the body to face stress. 2. Secretes tropic hormones 3. Secretes Oestrogens 4. Maintains blood sugar level 5. Regulates basal metabolism 6. Secretes Testosterone.

SECTION B (40 Marks)

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

Question 3

- (i) Write the overall chemical equation for photosynthesis. [1]
- (ii) Ramesh is a farmer who has a vineyard and cultivates grapes. To improve the shape of the grapes and make them elongated he sprays a particular *phytohormone* at the time of fruiting. [2]



- (a) Name the *phytohormone* that Ramesh sprays on the plant at the time of fruiting.
- (b) These grapes are said to be seedless. What is the technical term for the formation of such fruits?
- (iii) Mention the *two* pairs of nitrogenous bases that are present in a DNA strand and pair with each other by hydrogen bonds. [2]
- (iv) State *any two* disadvantages of living close to an airport. [2]
- (v) Draw a neat, labelled diagram of an animal cell showing Metaphase with four chromosomes. [3]

Question 4

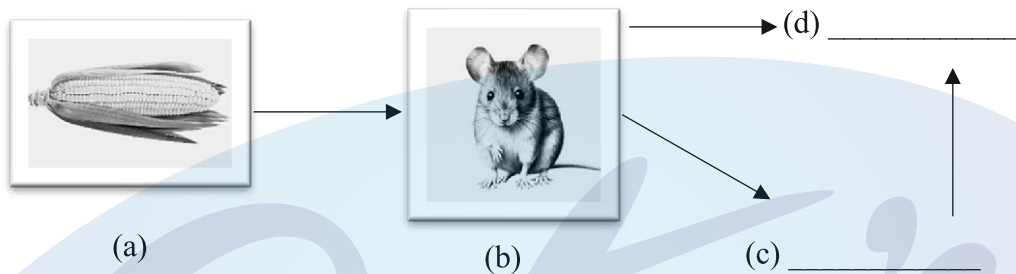
(i) What is the structure of DNA as proposed by Watson and Crick? [1]

(ii) Name the white blood cells that: [2]

(a) show phagocytosis

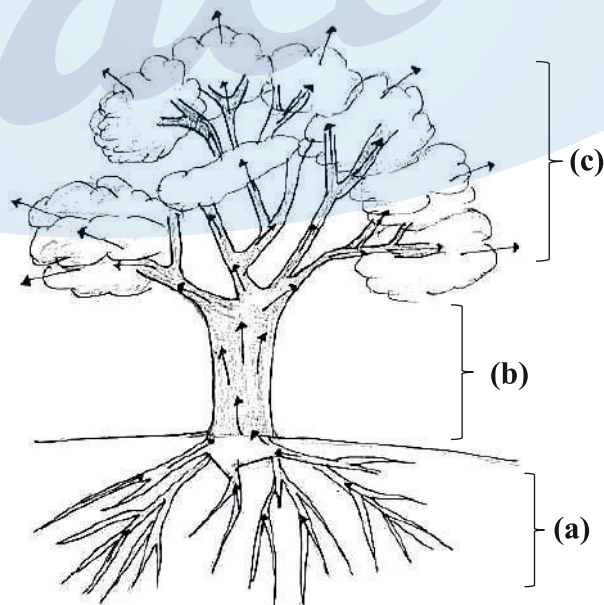
(b) produce antibodies

(iii) Complete the food chain by mentioning the names of the organisms in (c) and (d): [2]



(iv) State *any two* harmful effects of acid rain. [2]

(v) Given below is a picture of a tree. Mention the scientific phenomena occurring in the parts labelled (a), (b) and (c). [3]



Question 5

- (i) What is Micturition? Explain. [1]
- (ii) What are biomedical wastes? Give an example. [2]
- (iii) Differentiate between the functions of Urethra and Uterus. [2]
- (iv) Rachna is an expert gymnast on the balance beam. She has been vigorously practising for the Olympic Games. Lately, she has been experiencing dizziness and losing her balance during the practise sessions. [2]

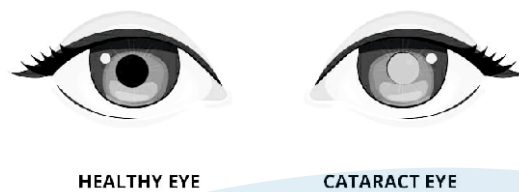


- (a) Which part of the membranous labyrinth is responsible for maintaining the body balance on the beam? [1]
- (b) Which type of balance is maintained by the structure mentioned in (a)? [1]
- (v) Draw a neat, labelled diagram to show that oxygen is released during photosynthesis. [3]

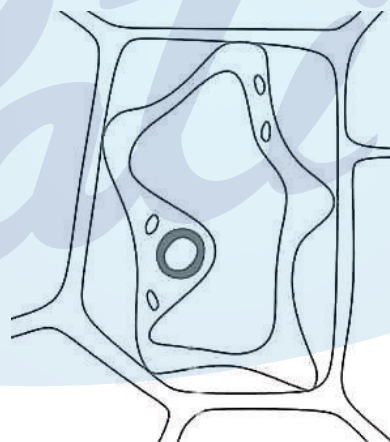
Question 6

- (i) Where are Hydathodes located? [1]
- (ii) What are Vestigial organs? Give *one* example of a vestigial structure in the human mouth. [2]

- (iii) Ahmed had a severe throat infection. After a few days he developed an earache too. What could be the reason for the pain in his ears? Explain. [2]
- (iv) Mr. Sharma is a 76 year old man. His vision was gradually becoming blurred. He consulted an eye doctor and it was diagnosed as cataract. [2]



- (a) Which part of the eye does cataract affect?
- (b) Why does the vision become blurred?
- (v) Given below is the diagram of a *plasmolysed* cortical cell of a root. [3]



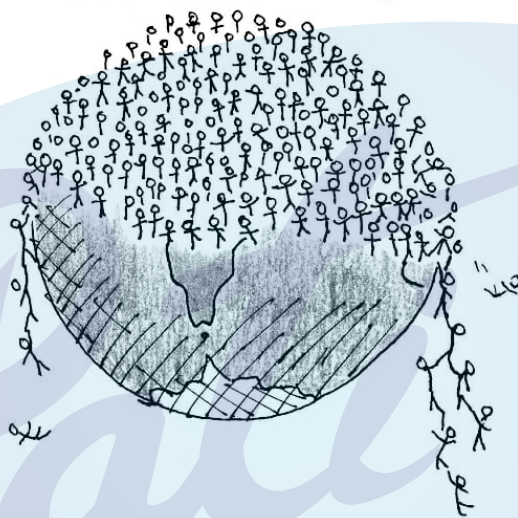
Copy the diagram and label the following parts in the diagram:

- (a) Cytoplasm
- (b) Hypertonic solution
- (c) Plasma membrane

Question 7

- (i) Define the term Allele. [1]
- (ii) In the last century, the human population has increased tremendously. Death rate has reduced and life expectancy has increased. This rapid growth has placed significant pressure on resources. Global cooperation is needed for environmental preservation. [2]

OVERPOPULATION



- (a) Mention *any one* reason for reduction in the death rate.
- (b) Name *any one* resource that is under pressure due to population explosion.
- (iii) Mention *any two* functions of amniotic fluid. [2]
- (iv) Expand the following abbreviations: [2]
- (a) CFC
- (b) CNG

- (v) Vineet's day begins with a cup of piping hot coffee. Caffeine is a stimulant present in coffee which increases the circulation of Adrenaline in the body. Vineet feels refreshed, alert and focussed. [3]

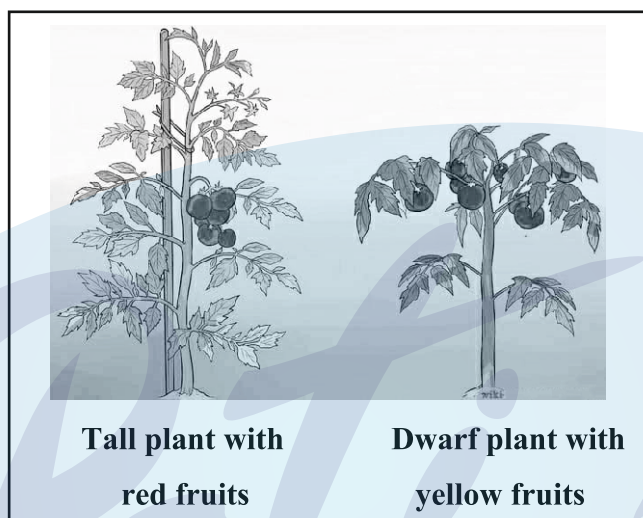


- (a) Name the organ that is stimulated by caffeine which makes Vineet alert and focussed.
- (b) Give the collective term for the protective membranes of the organ mentioned in (a).
- (c) Which part of the autonomic nervous system increases the secretion of Adrenaline?

Question 8

- (i) Explain the term Excretion. [1]
- (ii) State the difference between *Nephron* and *Neuron*. [2]
- (iii) Mention *any two* objectives of Swachh Bharat Abhiyan. [2]
- (iv) Give *any two* characteristic features of a Cro-Magnon man. [2]

- (v) A farmer cultivates a unique species of tomato plants. The two traits selected for breeding were: Colour of the fruits and height of the plants. The farmer initially crosses a homozygous tall plant bearing red fruits (**TT RR**) with a dwarf plant bearing yellow fruits (**tt rr**) and the genotype of all the offsprings of the **F₁** generation was **Tt Rr**. Next, he crosses two **F₁** generation plants (**Tt Rr**). [3]



- (a) Explain the phenotype of the offsprings of the **F₁** generation obtained from the initial cross.
- (b) Mention the phenotypic ratio of the **F₂** generation offsprings.
- (c) State Mendel's Law of Independent Assortment.

2024

BIOLOGY

(SCIENCE PAPER – 3)

Maximum Marks: 80

Time allowed: Two hours

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

*You will **not** be allowed to write during first 15 minutes.*

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

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

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

SECTION A (40 Marks)

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

Question 1

Select the correct answers to the questions from the given options.

[15]

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

- (i) Duplicated chromosomes are joined at a point termed:
- (a) Centrosome
 - (b) Centromere
 - (c) Centriole
 - (d) Chromatid
- (ii) The process of conversion of ADP to ATP during photosynthesis is called:
- (a) Photolysis
 - (b) Phagocytosis
 - (c) Photophosphorylation
 - (d) Polymerisation

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

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Turn Over

- (iii) The process in which water is lost from the margins of strawberry leaves is:
- (a) Osmosis
 - (b) Imbibition
 - (c) Diffusion
 - (d) Guttation
- (iv) The hormone that affects urination is:
- (a) Adrenaline
 - (b) Vasopressin
 - (c) Oestrogen
 - (d) Thyroxine
- (v) Which one of the following helps in the opening of stomata:
- (a) Cobalt ions
 - (b) Potassium ions
 - (c) Magnesium ions
 - (d) Aluminium ions
- (vi) A zygote which has Y chromosome inherited from the father will develop into a:
- (a) Will depend on the chromosome inherited from the mother
 - (b) Girl
 - (c) Either boy or a girl
 - (d) Boy
- (vii) The ear ossicle that transports sound vibrations to the inner ear:
- (a) Stapes
 - (b) Malleus
 - (c) Incus
 - (d) Cochlea

(viii) If a person has a heart attack, what must be done immediately?

- P.** Loosen his/her clothing
- Q.** Make him/her lie down in an airy room
- R.** Rush him/her to the hospital
- S.** Engage him/her in a conversation

- (a) **P and Q**
- (b) **P and S**
- (c) **R and S**
- (d) **P, Q and R**

(ix) Adjusting the focal length of the eye lens to view objects at different distances is done by:

- (a) Cornea
- (b) Iris
- (c) Ciliary muscles
- (d) Sclera

(x) Four friends **P, Q, R** and **S** were discussing the examples of genetic disorders. The examples they quoted were as follows:

- P.** Colour blindness and Malaria
- Q.** Albinism and Cholera
- R.** Haemophilia and Colour blindness
- S.** Haemophilia and Albinism

Who gave the correct examples?

- (a) **P and Q**
- (b) **R and S**
- (c) **P and R**
- (d) **Q and S**

- (xi) Osmosis takes place when there is:
- (a) A freely permeable membrane
 - (b) A cell wall
 - (c) A selectively permeable membrane
 - (d) An impermeable membrane
- (xii) A male gorilla has 48 chromosomes in each of its body cells. How many chromosomes will each of the sperms have?
- (a) 24
 - (b) 48
 - (c) 12
 - (d) 16
- (xiii) **Assertion (A):** Sympathetic nervous system prepares the body for violent action against abnormal conditions.
- Reason (R):** Sympathetic nervous system accelerates heartbeat.
- Which of the following is correct?
- (a) Both A and R are True
 - (b) A is True, R is False
 - (c) A is False but R is True
 - (d) Both A and R are False
- (xiv) Birth rate is the number of live births per thousand persons in:
- (a) 1 year
 - (b) 2 years
 - (c) 10 years
 - (d) 20 years



(xv) Industrial Melanism was observed in:

- (a) Mice
- (b) Peppered Moth
- (c) House Flies
- (d) Crow

Question 2

(i) **Name the following:**

[5]

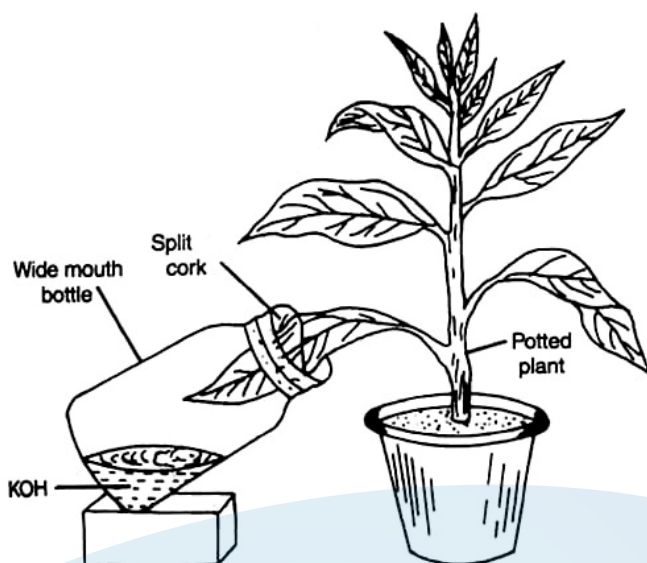
- (a) Unicellular outgrowths from the epidermis of roots.
- (b) A defect in our eyes, in which some parts of the object are in focus while the other parts are blurred.
- (c) The tropic movement of plant parts in response to chemicals.
- (d) The main nitrogenous waste formed in the body.
- (e) The process of attachment of fertilized ovum to the wall of uterus.

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

[5]

- (a) Australopithecus, Cro-Magnon, Homo erectus, Neanderthal man.
- (b) Pupil, Aqueous humour, Retina, Vitreous humour.
- (c) Effector, Receptor, Motor neuron, Sensory neuron.
- (d) Loop of Henle, Distal convoluted tubule, Bowman's Capsule, Proximal convoluted tubule.
- (e) Water vapour, Soil water, Leaves, Ascent of Sap

- (iii) Study the diagram given below and fill in the blanks with suitable words: [5]



In order to prove that carbon dioxide is necessary for (a) _____, a potted plant is placed in dark for 48 hours to (b) _____ the leaves. A part of a leaf is inserted into a conical flask containing potassium hydroxide solution. This is to absorb (c) _____ from the flask. The plant is then placed in sunlight for a few hours. The experimental leaf is tested for starch. The part of the leaf that was inside the conical flask turns (d) _____, whereas the part of the leaf outside turns (e) _____ in colour.

- (iv) Choose the **odd** one out from the following terms and name the **category to which the others belong**: [5]
- Prothrombin, Thrombin, Fibrinogen, Albumin
 - Tonsils, Glomerulus, Spleen, Lymph nodes
 - Neutrophils, Basophils, Monocytes, Eosinophils
 - Leaves, Styrofoam, Grass, Cow Dung
 - Pulmonary artery, Renal artery, Coronary artery, Hepatic artery

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

Column I	Column II
(a) Leydig Cells	1. Lack of thyroxine in children
(b) Stoma	2. 12 pairs
(c) Ova	3. Testosterone
(d) Cranial nerve	4. Diffusion of respiratory gases
(e) Cretinism	5. Haploid cells
	6. 31 Pairs
	7. Diploid cells

SECTION B (40 Marks)

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

Question 3

- (i) Expand the abbreviation-NADP. [1]
- (ii) Mention *two* adaptations in roots for absorption of water from the soil. [2]
- (iii) Differentiate between Afferent arteriole and Efferent arteriole (**diameter**). [2]
- (iv) Give *two* examples of water pollutants. [2]
- (v) Ali has some pea plants in his garden which need a support to grow as seen in the picture given below: [3]



- (a) Name the phenomenon depicted by the shoot in the given figure.
- (b) Define the above phenomenon.
- (c) Write the name of the part marked X.

Question 4

- (i) Give the biological term for the surgical method of contraception in human females. [1]
- (ii) State *two* harmful effects of acid rain on the environment. [2]
- (iii) Mention *two* advantages of Transpiration. [2]
- (iv) Write *any two* objectives of Swachh Bharat Abhiyan. [2]
- (v) Mohan is fond of playing basketball. His concentration is on shooting the ball into the opponent's basket as given in the picture. [3]

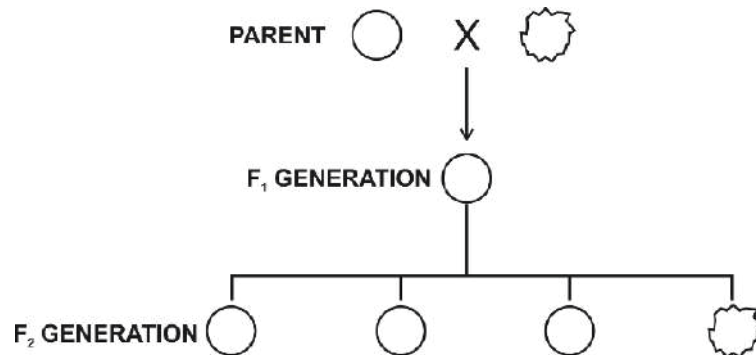


- (a) Which part of the brain helps Mohan to concentrate in putting the ball into the basket?
- (b) Name the sense organ that helps to gauge the distance between the ball and the basket.
- (c) Name the part of the brain that co-ordinates all the voluntary muscles of his body.

Question 5

- (i) Name the type of nerve which has the fibres of both sensory and motor neurons. [1]
- (ii) Differentiate between Australopithecus and Modern man based on body hair. [2]
- (iii) "Birth rate in India is very high." Mention *two* reasons in support of the statement. [2]
- (iv) Give the exact location of: [2]
 - (a) Pericardium
 - (b) Bicuspid valve

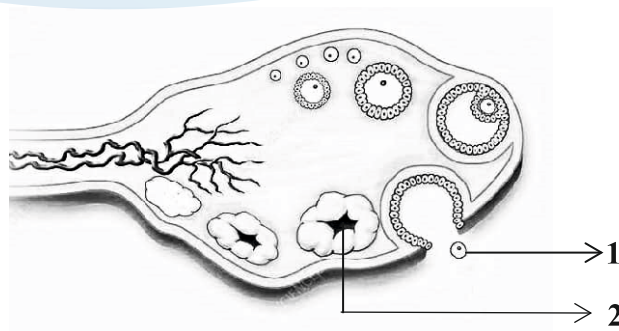
- (v) Given below is a schematic representation of the inheritance of the shape of seeds of garden pea. Answer the questions that follow: [3]



- Which is the dominant and recessive allele of the trait?
- What does the ratio 3 : 1 in the F₂ generation represent?
- State Mendel's Law of Dominance.

Question 6

- Define the term-Diapyknosis. [1]
- Distinguish between Diabetes mellitus and Diabetes insipidus (**endocrine gland concerned**). [2]
- Carbon monoxide is dangerous when inhaled in excess. Comment on the statement. [2]
- The diagram given below shows a section of the human ovary. [2]



- Name the process for the release of the part labelled 1.
 - Write the name of the structure marked 2.
- (v) Draw a neat, labelled diagram of a chloroplast. [3]

Question 7

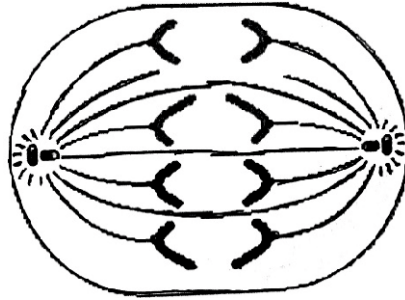
- (i) Define the term hormone. [1]
- (ii) Which parts of the ear are responsible for: [2]
- (a) Static equilibrium?
- (b) Dynamic equilibrium?
- (iii) Mention *two* structural differences between an artery and a vein. [2]
- (iv) Write *any two* limitations of using a Ganong's Potometer to demonstrate the uptake of water. [2]
- (v) A teacher drew the diagram of heart on the blackboard and told the students to copy it in their notebooks. Mahesh couldn't see the diagram clearly as it appeared blurred to him. [3]
- (a) Name the defect of the eye Mahesh is suffering from.
- (b) Where is the image formed in this defect?
- (c) Mahesh consults an eye doctor and is prescribed suitable lenses to correct the defect. Which type of lens do his spectacles have?

Question 8

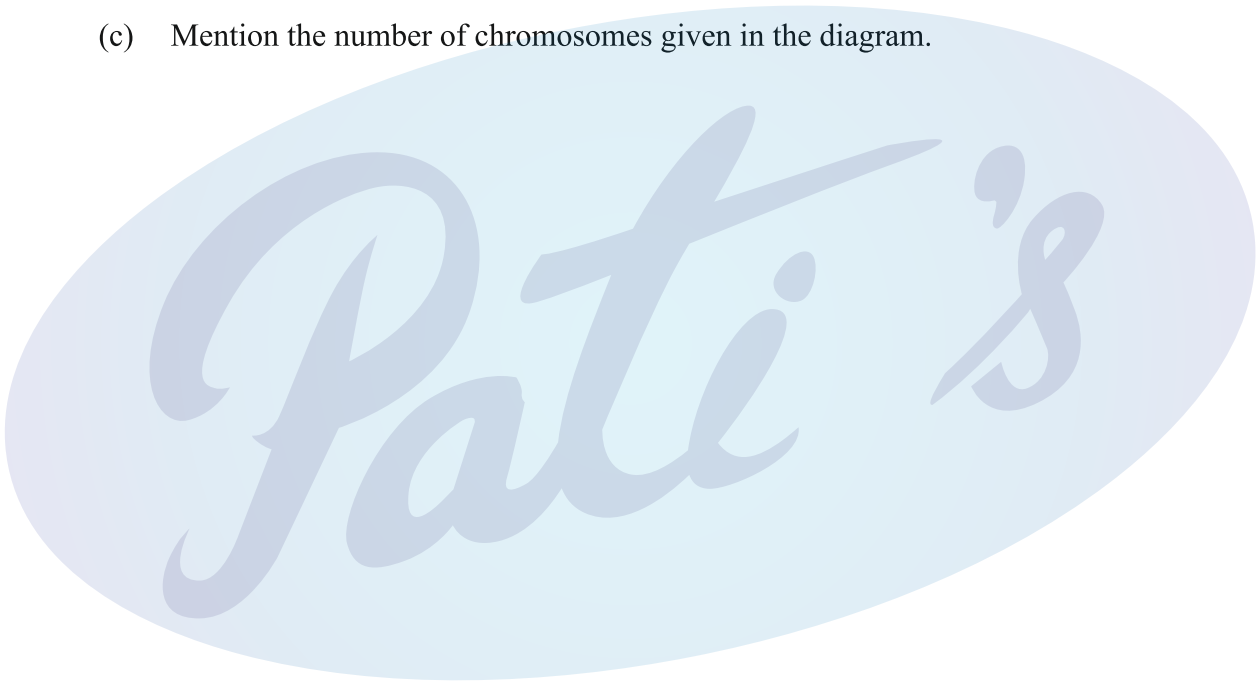
- (i) Define the term ultrafiltration. [1]
- (ii) Name the mineral elements required for: [2]
- (a) Clotting of blood
- (b) Synthesis of thyroxine
- (iii) Mention *two* harmful effects of noise pollution. [2]
- (iv) Why are RBCs efficient in their functions though they lack nucleus and mitochondria? [2]

(v) The diagram given below represents a stage in mitosis.

[3]



- (a) Identify the stage given above.
- (b) Give *one* reason to support your answer in (a).
- (c) Mention the number of chromosomes given in the diagram.



BIOLOGY
(SCIENCE PAPER – 3)

Maximum Marks: 80

Time allowed: Two hours

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

*You will **not** be allowed to write during first **15** minutes.*

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

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

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

SECTION A (40 Marks)

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

Question 1

Select the correct answers to the questions from the given options.

[15]

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

- (i) The sex chromosome in a human ovum is:
- (a) X chromosome
 - (b) Y chromosome
 - (c) Both X and Y chromosomes
 - (d) Either X or Y chromosome

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

- (ii) Which one of the following is a biodegradable waste?
- (a) Metal cans
 - (b) E-waste
 - (c) Plastic
 - (d) Flowers
- (iii) The heart sound 'Dup' is produced when:
- (a) Semilunar valves open
 - (b) Atrio ventricular valves close
 - (c) Semilunar valves close
 - (d) Atrio ventricular valves open
- (iv) Deplasmolysis occurs when a plasmolysed cell is placed in:
- (a) Concentrated salt solution
 - (b) Tap water
 - (c) Concentrated sugar solution
 - (d) Hypertonic salt solution
- (v) Alpha cells of Pancreas secrete:
- (a) Glycogen
 - (b) Glucose
 - (c) Glucagon
 - (d) Insulin
- (vi) Haploid number of chromosomes are found in:
- (a) Nephrons
 - (b) Neurons
 - (c) Skin cells
 - (d) Sperms

- (vii) The life span of an RBC is:
- (a) 120 days
 - (b) 220 days
 - (c) 20 days
 - (d) 2 weeks
- (viii) The statistical study of human population is called:
- (a) Mortality
 - (b) Demography
 - (c) Natality
 - (d) Equality
- (ix) The pale yellow colour of normal human urine is due to the pigment:
- (a) Melanin
 - (b) Anthocyanin
 - (c) Urochrome
 - (d) Haemoglobin
- (x) Stimulation of the nerves of the sympathetic nervous system:
- (a) Accelerates heartbeat
 - (b) Constricts pupil of eyes
 - (c) Increases peristalsis
 - (d) Retards heartbeat
- (xi) The site of light reaction in the cells of a green leaf is:
- (a) Nucleus
 - (b) Grana of chloroplast
 - (c) Cytoplasm
 - (d) Stroma of chloroplast

- (xii) The paper used to demonstrate unequal transpiration in a dicot leaf is:
- (a) Filter paper
 - (b) Litmus paper
 - (c) Starch paper
 - (d) Cobalt chloride paper
- (xiii) Vitreous humour is present between:
- (a) Cornea and Iris
 - (b) Lens and Retina
 - (c) Iris and Lens
 - (d) Cornea and Lens
- (xiv) Oxygenated blood to liver is supplied by:
- (a) Hepatic artery
 - (b) Hepatic vein
 - (c) Inferior venacava
 - (d) Hepatic portal vein
- (xv) During the synthesis phase of the cell cycle, more of:
- (a) RNA is synthesised
 - (b) RNA and proteins are synthesised
 - (c) DNA is synthesised
 - (d) Glucose is synthesized

Question 2

- (i) Name the following: [5]
- (a) The organelle that forms the aster during cell division.
 - (b) A genetic disorder in which the blood does not clot.
 - (c) The permanent stoppage of menstruation in human females around the age of 45 years.
 - (d) The openings on the barks of trees through which transpiration occurs.
 - (e) A gaseous plant hormone which promotes ripening of fruits.
- (ii) Arrange and rewrite the terms in each group in correct order to be in a logical sequence *beginning* with the term that is underlined: [5]
- (a) Snake, Rabbit, Cabbage, Hawk.
 - (b) Xylem, Soil water, Cortical cells, Root hair.
 - (c) Receptor, Response, Effector, Spinal Cord
 - (d) Fovea, Lens, Cornea, Conjunctiva.
 - (e) Testis, Urethra, Sperm duct, Epididymis.
- (iii) Match the items given in **Column I** with most appropriate ones in **Column II** and rewrite the correct matching pairs: [5]

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

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

- (a) Used bandages, Pesticides, Face masks, Syringes.
- (b) Dust, Smoke, Carbon monoxide, Effluents
- (c) Uterus, Urethra, Urinary bladder, Ureter
- (d) Menstrual phase, Telophase, Follicular phase, Luteal phase
- (e) Malleus, Incus, Cochlea, Stapes

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

- (a) Thyroid gland
- (b) Dura mater
- (c) Amniotic fluid
- (d) Papillary muscles
- (e) Islets of Langerhans

SECTION B (40 Marks)

(Attempt any four questions from this Section.)

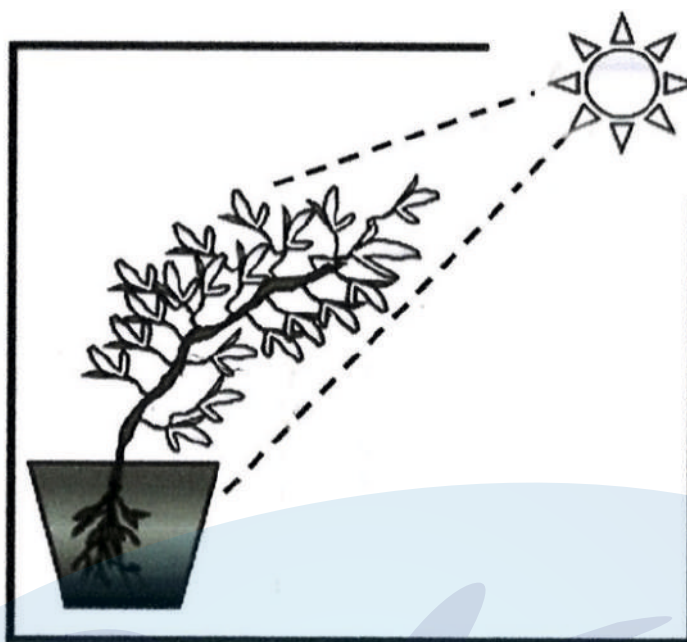
Question 3

- (i) Write the overall chemical equation for photosynthesis. [1]
- (ii) Mention *any two* functions of blood. [2]
- (iii) Differentiate between Karyokinesis and Cytokinesis. [2]
- (iv) *Excessive use of fertilizers in agricultural fields reduces the yield of crops.* [2]

Justify the statement.

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

[3]



- Name the phenomenon depicted by the shoot in the above diagram.
- Which plant hormone plays an important role in the above movement?
- Complete and rewrite the given statement by filling in the correct terms:

Shoots show positive _____ whereas, roots show positive _____.

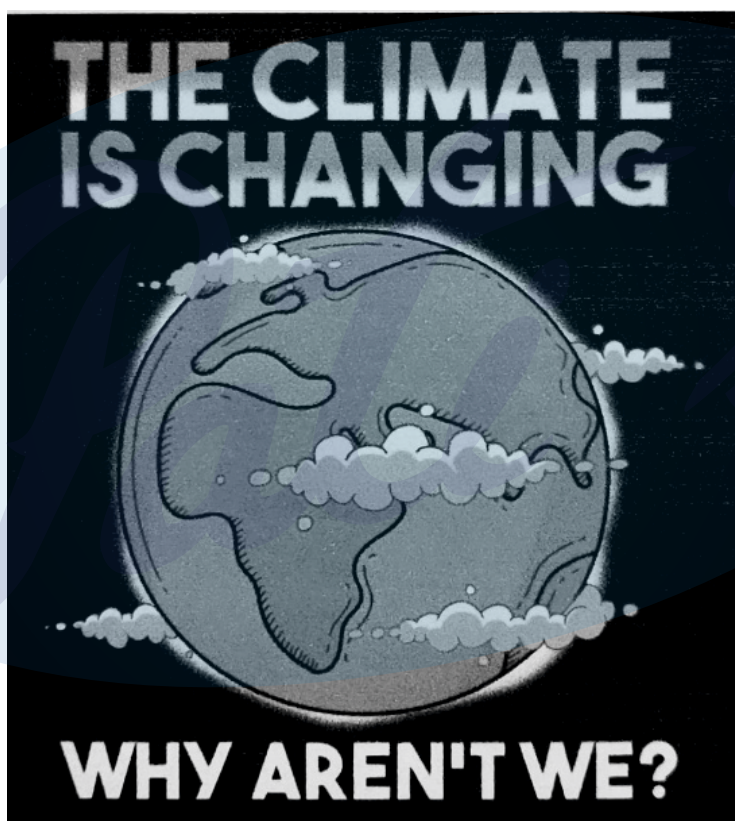
Question 4

- Expand the abbreviation – DNA. [1]
- What is Active transport? [2]
- Mention the *two* pairs of nitrogenous bases which pair with each other with hydrogen bonds. [2]
- State Mendel's 'Law of Segregation'. [2]
- Draw a neat, labelled diagram of a human sperm. [3]

Question 5

- (i) Explain the term 'Population density'. [1]
- (ii) Name the *two* surgical methods of population control. [2]
- (iii) Mention *two* factors responsible for population explosion in India. [2]
- (iv) Name *any two* resources which come under pressure due to rising population. [2]
- (v) The diagram given below depicts the climate change on planet Earth. [3]

Answer the following questions:



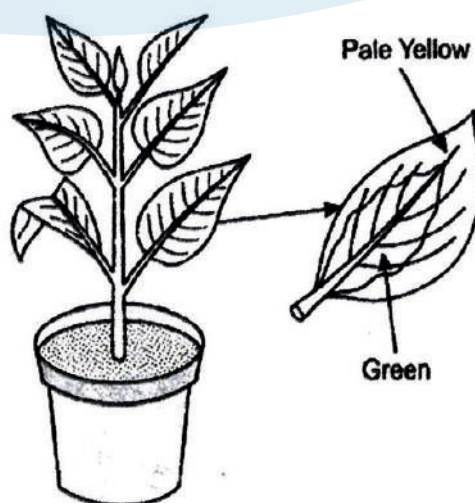
- (a) Name the climatic phenomenon for the increase in Earth's temperature.
- (b) Mention *one* reason for this warming.
- (c) What measure can be taken to prevent this climate change?

Question 6

- (i) Define the term Transpiration. [1]
- (ii) State *any two* adaptations in plants to reduce transpiration. [2]
- (iii) Mention *any two* functions of the human foetal placenta. [2]
- (iv) What is the significance of the human testes being located in scrotal sacs outside the abdomen? [2]
- (v) Draw a neat, labelled diagram of a Malpighian Capsule. [3]

Question 7

- (i) What is a Reflex action? [1]
- (ii) Renal cortex has a dotted appearance and Renal medulla has a striped appearance. Explain. [2]
- (iii) What are the *two* functions of cerebellum. [2]
- (iv) Distinguish between Semicircular canals and Utriculus based on their function. [2]
- (v) A potted plant with variegated leaves was kept in dark for 24 hours and then placed in bright sunlight. Answer the following questions. [3]



- (a) Which aspect of photosynthesis is being tested in the above diagram?
- (b) Why was the plant kept in dark for 24 hours?
- (c) After the starch test what will be the colour of the yellow and green parts of the leaf? Give reasons to support your answer.

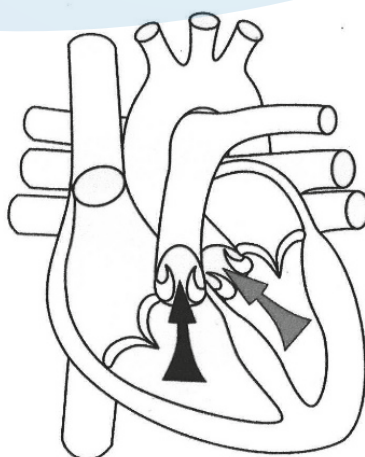
Question 8

- (i) Define the term Mutation. [1]
- (ii) A pure breeding red flower variety of pea plant (RR) is crossed with a pure breeding white flower variety of pea plant (rr). [2]

Draw a Punnett square to find out the Phenotypic and Genotypic ratios of the progeny belonging to the F₂ generation.

- (iii) Leaves of certain plants roll up on a hot sunny day. [2]
Explain by giving suitable reasons.
- (iv) What is a semi permeable membrane? [2]
Name the semi permeable membrane present in a plant cell.
- (v) The diagram below depicts the human heart in one of its phases. [3]

Answer the questions that follow:



- (a) Which part of the heart is in the contraction phase?
- (b) Give a suitable reason to justify your answer in (a).
- (c) Distinguish between Systole and Diastole.



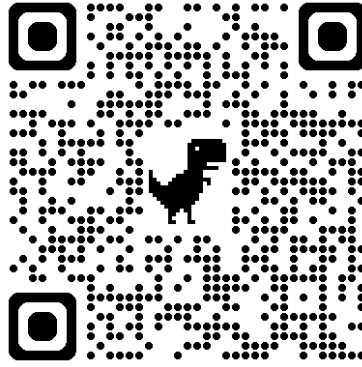


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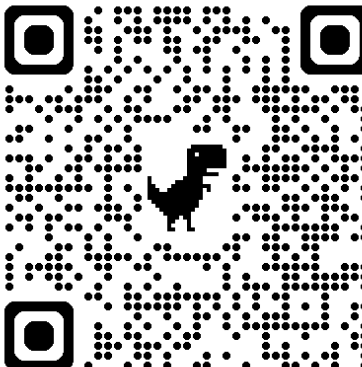
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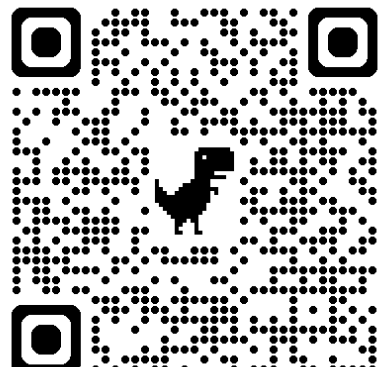
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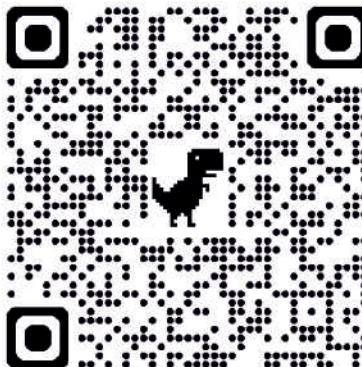
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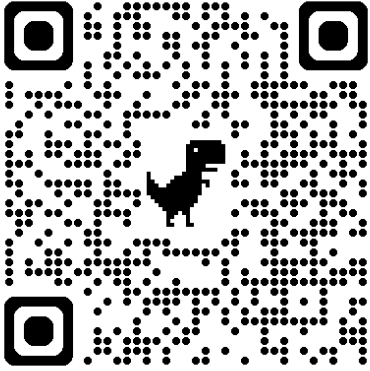
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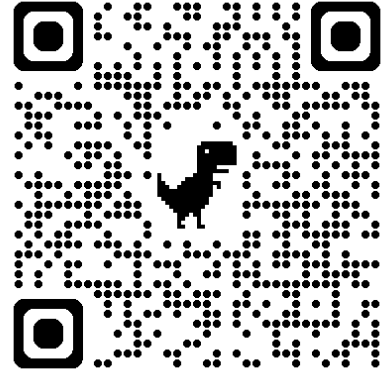
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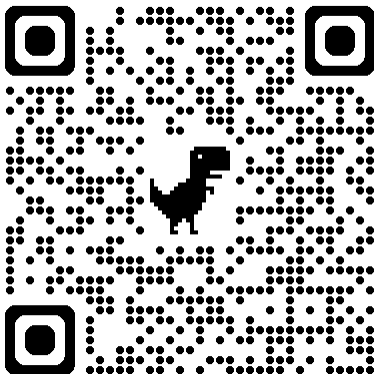
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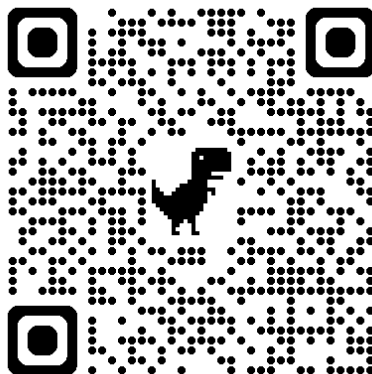
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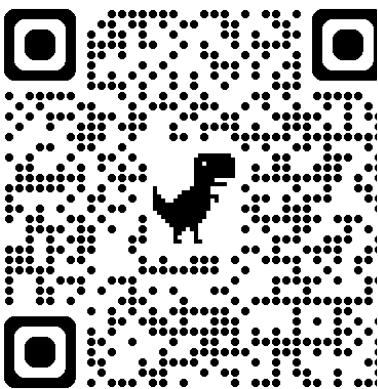
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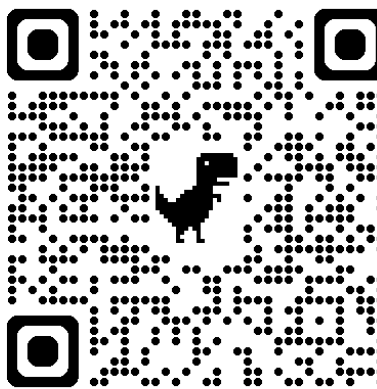
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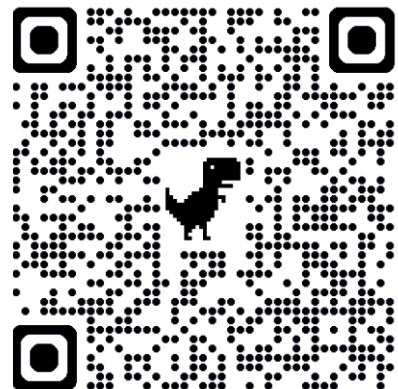
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