



Series ωZWYX



Set-5

प्रश्न-पत्र कोड
Q.P. Code

31(B)

रोल नं.

Roll No.

परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें ।

Candidates must write the Q.P. Code on the title page of the answer-book.

विज्ञान
(केवल दृष्टिबाधित परीक्षार्थियों के लिए)
SCIENCE
(FOR VISUALLY IMPAIRED CANDIDATES ONLY)

निर्धारित समय : 3 घण्टे

अधिकतम अंक : 80

Time allowed : 3 hours

Maximum Marks : 80

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 27 हैं ।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें ।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में 39 प्रश्न हैं ।
- कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें ।
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है । प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक छात्र केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।
- Please check that this question paper contains 27 printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 39 questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.



General Instructions :

Read the following instructions very carefully and strictly follow them :

- (i) *This question paper comprises **39** questions. **All** questions are compulsory.*
- (ii) *This question paper is divided into **five** sections – **A, B, C, D** and **E**.*
- (iii) ***Section A** – Questions No. **1** to **20** are multiple choice questions. Each question carries **1** mark.*
- (iv) ***Section B** – Questions No. **21** to **26** are very short answer type questions. Each question carries **2** marks. Answer to these questions should be in the range of 30 to 50 words.*
- (v) ***Section C** – Questions No. **27** to **33** are short answer type questions. Each question carries **3** marks. Answer to these questions should be in the range of 50 to 80 words.*
- (vi) ***Section D** – Questions No. **34** to **36** are long answer type questions. Each question carries **5** marks. Answer to these questions should be in the range of 80 to 120 words.*
- (vii) ***Section E** – Questions No. **37** to **39** are of 3 source-based/case-based units of assessment carrying **4** marks each with sub-parts.*
- (viii) *There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.*

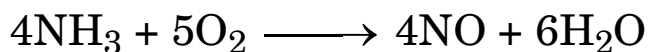
SECTION A

*This section has **20** multiple choice questions (Q.No. 1 – 20). **All** questions are **compulsory**. $20 \times 1 = 20$*

1. After burning a magnesium ribbon a student collected the ash so formed in a watch glass. He then dissolved this ash in water and tested the nature (acidic or basic) of the solution using pH paper and litmus solution. His correct observation would be :
 - (a) Its pH is 10 and it turns blue litmus to red.
 - (b) Its pH is 4 and it turns blue litmus to red.
 - (c) Its pH is 4 and it turns red litmus to blue.
 - (d) Its pH is 10 and it turns red litmus to blue.



2. Consider the following reaction :



This reaction is an example of which one of the following two reactions ?

- (a) Displacement reaction as well as redox reaction
- (b) Double displacement reaction as well as redox reaction
- (c) Displacement reaction as well as combination reaction
- (d) Combination reaction as well as double displacement reaction

3. Select the correct statement from the following :

- (a) CO_2 is a product of respiration whereas CO is a product of photosynthesis.
- (b) CO_2 is a product of respiration whereas Cl_2 is a product of chlor-alkali process.
- (c) CO_2 is a product of photosynthesis whereas H_2 is a product of chlor-alkali process.
- (d) CO_2 is a product of incomplete combustion whereas CO is a product of respiration.

4. On placing a silver coin in a test tube containing blue solution of CuSO_4 , a student would observe after some time, say 20 minutes, that the CuSO_4 solution

- (a) turns green and a grey substance is deposited on the coin.
- (b) turns colourless and a grey substance is deposited on the coin.
- (c) remains blue with no change in the silver coin.
- (d) turns colourless and reddish brown substance is deposited on the coin.



5. A compound X is used in the paper, soap and glass industries. It can be prepared from common salt. 'X' is :
- anhydrous sodium carbonate (Na_2CO_3)
 - sodium carbonate decahydrate ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$)
 - sodium hydrogen carbonate (NaHCO_3)
 - sodium sulphate hemihydrate ($\text{Na}_2\text{SO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$)
6. Select from the following, a salt whose aqueous solution will have pH less than seven.
- Sodium chloride
 - Potassium sulphate
 - Sodium carbonate
 - Ammonium chloride
7. The hydrocarbon which will decolourize bromine water is :
- | | |
|-------------------------------|-------------------------------|
| (a) C_2H_6 | (b) C_3H_8 |
| (c) C_7H_{14} | (d) C_8H_{18} |
8. The organ that secretes insulin is :
- | | |
|------------------|---------------------|
| (a) gall bladder | (b) small intestine |
| (c) pancreas | (d) stomach |
9. During deficiency of oxygen in the tissues of human beings, pyruvate is converted into lactic acid in :
- | | |
|------------------|-----------------|
| (a) cytoplasm | (b) golgi body |
| (c) mitochondria | (d) chloroplast |
10. When a pure tall pea plant is crossed with a pure dwarf pea plant, the percentage of tall pea plant in F_1 and F_2 generation pea plants respectively will be :
- | | |
|---------------|----------------|
| (a) 100%; 25% | (b) 100%; 50% |
| (c) 100%; 75% | (d) 100%; 100% |



- 11.** The voluntary actions such as reading and writing are controlled by :
- (a) cerebellum (b) cerebrum
(c) medulla (d) pons
- 12.** When an organism breaks into a number of parts and each part develops into a complete organism, it is known as :
- (a) budding
(b) regeneration
(c) vegetative propagation
(d) spore formation
- 13.** SI unit of electrical resistivity is :
- (a) ohm metre (b) ohm per metre
(c) ohm / metre² (d) ohm / metre³
- 14.** You have a thin resistance wire having a thick plastic insulation. A decrease in the resistance of this wire would be produced if somehow we increase the :
- (a) thickness of the plastic insulation
(b) temperature of the wire
(c) length of the wire
(d) diameter of the wire
- 15.** An electron projected towards east is deflected towards south by a uniform magnetic field. The direction of the magnetic field is :
- (a) upwards (b) downwards
(c) towards north (d) towards west



16. A student has a long straight thick copper wire. If he passes a current in this wire he would get a magnetic field whose pattern must be :
- (a) radial lines originating from the wire.
 - (b) concentric circles centred around the wire.
 - (c) straight lines parallel to the wire.
 - (d) straight lines perpendicular to the wire.

For Questions number 17 to 20, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
 - (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of the Assertion (A).
 - (c) Assertion (A) is true, but Reason (R) is false.
 - (d) Assertion (A) is false, but Reason (R) is true.
17. ***Assertion (A) :*** It is possible to store copper sulphate solution in a container made of iron sheet.
- Reason (R) :*** Iron is a more reactive metal than copper.
18. ***Assertion (A) :*** Human beings have one pair of sex chromosomes.
- Reason (R) :*** All children, whether boys or girls, inherit an X-chromosome from their father.



19. *Assertion (A)* : The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms.

Reason (R) : The amount of oxygen dissolved in water is fairly low as compared to the amount of oxygen in air.

20. *Assertion (A)* : Magnetic fields interact with moving charges and not with charges at rest.

Reason (R) : Charges produce magnetic field only when they move.

SECTION B

21. (a) What is a balanced chemical equation ? Why do we balance chemical equations ? 2

OR

(b) Why does the colour of iron sulphate solution fade when a piece of zinc is dipped in it ? Give chemical equation for the reaction involved. 2

22. List four life-processes that are essential for maintaining life. 2

23. (a) How is oxygen transported in human beings ? 2

OR

(b) What is saliva ? State its role in the digestion of food. 2

24. Name the process by which the amount of urine produced in human beings is regulated. Where and how is this process carried out ? 2



- 25.** (a) (i) What is the (I) least distance of distinct vision, and (II) far point of a normal human eye ?
- (ii) A student is unable to see distinctly a chart hanging on the wall of his classroom. Name the defect of vision he is suffering from and the type of corrective lens he must use in his spectacles. 2

OR

- (b) Write the main function of each of the following in the human eye :
- (i) Cornea
- (ii) Iris
- (iii) Retina
- (iv) Ciliary muscles 2

- 26.** Construct a food chain comprising the following organisms :

Hawk, Frogs, Snakes, Plants

Which of these will have the highest concentration of the harmful chemicals such as pesticides ? Name the phenomenon. 2

SECTION C

- 27.** A student is heating ferrous sulphate crystals in a boiling tube.
- (a) State the change in colour he is likely to observe during the process of heating.
- (b) Name the gases produced during heating.
- (c) Write chemical equation for the reaction. 3



28. (a) (i) Name one antacid. State how it helps to relieve indigestion in the stomach.
- (ii) A student wants to dilute a strong acid such as sulphuric acid. For this purpose, why should the acid be added to water and not water to the acid ? 3

OR

(b) A student dropped a few pieces of white marble in dilute hydrochloric acid contained in a test tube. The gas evolved was then passed through freshly prepared lime water.

- (i) Name the gas evolved.
- (ii) State the change the student would observe in lime water.
- (iii) What change would be observed if excess of this gas is passed through lime water ?

Give reason for your answer in (ii) and (iii) given above. 3

29. (a) Define geotropism and explain the term positive geotropism and negative geotropism giving one example for each. 3

OR

(b) Name the plant hormone that helps in the bending of the plant stem towards light. Explain its function. Also name this phenomenon. 3



- 30.** A student wants to draw a ray diagram to show the formation of image due to a concave mirror when an object is placed in between its focus and centre of curvature.
- Write the minimum number of incident rays required.
 - State the paths of the incident rays.
 - State the paths of the reflected rays.
 - Write the sign of magnification according to the New Cartesian Sign Convention. 3
- 31.** (a) A candle flame and a screen are placed 1 m apart. When a lens is placed exactly in the middle of the two, a distinct image of the candle flame is observed on the screen.
- Name the type of the lens used.
 - How is focal length of the lens determined in this case? State the method and determine its value.
 - Write the power of the lens used. 3
- OR**
- (b) (i) Define absolute refractive index.
- (ii) The absolute refractive indices of water and glass are $\frac{4}{3}$ and $\frac{3}{2}$ respectively. If the speed of light in glass is 2×10^8 m/s, find :
- Speed of light in vacuum
 - Speed of light in water 3



- 32.** What is a solenoid ? How does a current carrying solenoid behave when suspended freely and why ? Give its one main use. 3
- 33.** Define the term ecosystem. List its two main components. We do not clean natural ponds or lakes, but an aquarium needs to be cleaned regularly. Why ? 3

SECTION D

- 34.** (a) Write the names of the following compounds :
- (i) $\text{CH}_3 - \text{CH}_2\text{COOH}$
- (ii) C_6H_6
- (b) What is a homologous series of carbon compounds ? Construct a homologous series of alcohols.
- (c) What happens when ethanol reacts with ethanoic acid in the presence of an acid ? Name the reaction and write its chemical equation. 5
- 35.** (a) (i) Define vegetative propagation. List its any two advantages.
- (ii) Write in tabular form two differences between binary fission and multiple fission giving one example for each. 5
- OR**
- (b) (i) State in brief the functions of the following organs in the human female reproductive system :
- (I) Ovary
- (II) Fallopian tube
- (III) Uterus
- (ii) What is menstruation ? Why does it occur ? 5



- 36.** (a) Derive an expression for the amount of heat produced when a current flows through a resistor for a given time. Use this expression to state Joule's law of heating.
- (b) 200 joules of heat energy is produced each second in a resistor of 8Ω . Find :
- (i) The current flowing through the resistor, and
- (ii) The potential difference across the ends of the resistor.

5

SECTION E

Q.No. 37 to 39 are source-based/case-based questions with 3 sub-parts. Internal choice is provided in one of these sub-parts.

37. Decomposition is a type of reaction in which a single compound splits into two or more simple compounds. Decomposition reactions are generally classified into three types, depending upon the type of energy required for the reaction. The three types are thermal decomposition, photolytic decomposition and electrolytic decomposition.

- (a) Why are decomposition reactions known as endothermic reactions ? 1
- (b) Give an example of photolytic decomposition. 1
- (c) Name the gas liberated at the (i) cathode, and (ii) anode when water is electrolysed. Write the molar ratio of hydrogen and oxygen (Hydrogen : Oxygen) liberated during electrolysis. 2

OR

- (c) What happens when lead nitrate powder is heated in a boiling tube ? Write chemical equation for the reaction. 2



- 38.** Hormones are chemical informational molecules that are required in minute amounts and are directly poured into the blood stream. The animal hormones are secreted in the desired amounts by the endocrine glands. Each hormone is responsible for carrying out specific actions in the body. The deficiency or excess of hormones has a harmful effect on our body. Hence, the timing and the amount of hormones secreted by glands are controlled by the feedback mechanism.
- (a) Name the hormones secreted by ovary and testes. 1
- (b) Write the function of adrenaline. 1
- (c) Write the name and function of a hormone secreted by
(i) Pituitary gland and (ii) Thyroid gland. 2

OR

- (c) What is the meaning of feedback mechanism ? 2
- 39.** A simple magnifier or microscope is a convex lens of small focal length. In order to use such a lens as a microscope, the lens is held near the object to get an erect, magnified and virtual image of the object. However, this microscope has a maximum limiting magnification. For much larger magnification we use a compound microscope in which two convex lenses are used, one compounding the effect of the other. The lens nearest the object, called the objective, forms a real, inverted and magnified image of the object. This image serves as the object for the second lens, the eyepiece which functions essentially like a simple microscope or magnifier and produces the final image.
- (a) You have a compound microscope in which a convex lens of focal length 'f' is used as objective. What should be the distance of the object from the objective in terms of 'f' ? 1



- (b) List two properties of the final image obtained from a compound microscope. 1
- (c) An object is placed in front of a convex lens at **a distance of two times the focal length of the lens**. List two properties of the image formed and write the value of magnification produced by the lens using the New Cartesian Sign Convention. 2

OR

- (c) An object is placed in front of a convex lens at **a distance more than two times the focal length of the lens**. List two properties of the image formed and write the value of magnification produced by the lens using the New Cartesian Sign Convention. 2

MARKING SCHEME

Secondary School Examination, 2023

SCIENCE (Subject Code-086)**[Paper Code: 31/B]****Maximum Marks: 80**

Q. No.	EXPECTED ANSWER / VALUE POINTS	Marks	Total Marks
	SECTION—A		
1.	(d)	1	1
2.	(a)	1	1
3.	(b)	1	1
4.	(c)	1	1
5.	(b)	1	1
6.	(d)	1	1
7.	(c)	1	1
8.	(c)	1	1
9.	(a)	1	1
10.	(c)	1	1
11.	(b)	1	1
12.	(b)	1	1
13.	(a)	1	1
14.	(d)	1	1
15.	(b)	1	1
16.	(b)	1	1
17.	(d)	1	1
18.	(c)	1	1
19.	(a)	1	1
20.	(a)	1	1

SECTION B			
21.	<p>(a) • A balanced chemical equation which has equal number of atoms of each element on the side of reactants and products.</p> <p>• To obey the law of conservation of mass.</p> <p style="text-align: center;">OR</p> <p>(b) • Zinc being more reactive, displaces iron from iron sulphate solution due to the formation of zinc sulphate</p> <p>• $\text{FeSO}_4 + \text{Zn} \longrightarrow \text{ZnSO}_4 + \text{Fe}$</p>	1 1 1 1	2
22.	Four processes which are essential for maintaining life – (i) nutrition (ii) respiration (iii) transportation (iv) excretion	$\frac{1}{2} \times 4$	2
23.	<p>(a) • Haemoglobin present in RBC gets attached to the oxygen molecule and the blood becomes oxygenated.</p> <p>• The oxygenated blood is then distributed to all the body cells in human beings.</p> <p style="text-align: center;">OR</p> <p>(b) • Saliva is a fluid secreted in the mouth by the salivary glands.</p> <p>• Saliva contains an enzyme which breaks down starch of food into simple sugar.</p>	1 1 1 1	2
24.	<ul style="list-style-type: none"> • Selective reabsorption • Nephrons <p>• The amount of water and mineral salts required by the body are reabsorbed such as glucose, amino acid in the tubular part of nephron.</p>	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
25.	<p>(a)</p> <p>(i) (I) 25 cm (II) infinity / ∞</p> <p>(ii) • myopia/near sightedness • concave lens/diverging lens</p> <p style="text-align: center;">OR</p> <p>(b)</p> <p>(i) Cornea – Most of the refraction of light rays falling on the eye.</p> <p>(ii) Iris – controls the size of the pupil.</p> <p>(iii) Retina – image is formed on it</p> <p>(iv) Ciliary muscles – To modify the curvature / focal length of the eye lens.</p>	$\frac{1}{2}, \frac{1}{2}$ $\frac{1}{2}, \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
26.	<ul style="list-style-type: none"> • Plants \longrightarrow frogs \longrightarrow snakes \longrightarrow hawks • Hawks • Biomagnification/Biological Magnification 	1 $\frac{1}{2}, \frac{1}{2}$	2

SECTION C			
27.	<p>(a) Pale green / green → brown</p> <p>(b) • Sulphur dioxide (SO₂) • Sulphur trioxide (SO₃)</p> <p>(c) $2\text{FeSO}_4 \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$</p> <p>[Note: Do not cut marks if equation is not balanced]</p>	<p>1</p> <p>½</p> <p>½</p> <p>1</p>	3
28.	<p>(a) (i) • Milk of Magnesia / Mg(OH)₂ (Magnesium hydroxide) / (Al(OH)₃ (Aluminium hydroxide) / (NaHCO₃) (Sodium hydrogen carbonate) (any other example)</p> <p>• neutralises excess acid produced in the stomach.</p> <p>(ii) If water is added to acid, excessive heat is produced which may cause burn / injury .Therefore, acid should be added to water drop-by-drop with constant stirring.</p> <p style="text-align: center;">OR</p> <p>(b) (i) CO₂ / Carbon dioxide</p> <p>(ii) • Lime water turns milky • Due to formation of CaCO₃ which is insoluble in water.</p> <p>(iii) • A clear solution is obtained when excess of CO₂ is passed. • It is due to formation of calcium hydrogen carbonate / Calcium bicarbonate / Ca(HCO₃)₂ which is soluble in water.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p>	3
29.	<p>(a)</p> <p>• The movement of a plant part (shoot / root) in response to earth / gravity is called geotropism.</p> <p>• When a part of the plant grows towards gravity, it is called Positive Geotropism. Example : roots of a plant</p> <p>• When a part of the plant grows away from gravity , it is called negative geotropism. Example: Shoot/ Stem of a plant</p> <p style="text-align: center;">OR</p> <p>(b) • Auxins</p>	<p>1</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>1</p>	

	<ul style="list-style-type: none"> • When growing shoot is exposed to unidirectional light , it results in auxin shifting towards the shaded side. More Auxin causes more growth of shoot in the shaded side resulting in the bending of stem towards sources of light. • Phototropism. 	1 1	3
30.	<p>(a) Two / 2</p> <p>(b) <ul style="list-style-type: none"> • Parallel to the principal axis • Passing through the principal focus • Ray passing through centre of curvature • Ray incident obliquely to principal axis. (any two points) </p> <p>(c) <ul style="list-style-type: none"> • After reflection passes through the principal focus. • After reflection becomes parallel to the principal axis. • After reflection, reflected back along same path. • Reflected obliquely (any two points) </p> <p>(d) negative</p>	1/2 1/2, 1/2 1/2, 1/2 1/2	3
31.	<p>(a)</p> <p>(i) Convex lens/Converging lens</p> <p>(ii) Distance between the flame and screen = 1 m ∴ Lens is placed exactly in the middle and a distinct image of the flame is formed on the screen. Object distance = Image distance = 2f ∴ 2f + 2f = 4f = 1 m ∴ f = $\frac{1}{4}$ m = 25 cm / 0.25 m</p> <p>(iii) Power = $\frac{1}{f(m)}$ = +4D</p> <p style="text-align: center;">OR</p> <p>(b)</p> <p>(i) Absolute refractive index of a medium is the ratio of speed of light in vacuum (or air) to the speed of light in the medium.</p> <p style="text-align: center;">/</p> <p>Absolute refractive index $n_m = \frac{\text{Speed of light in vacuum } (c)}{\text{Speed of light in the medium } v_m}$</p> <p>(ii) (I) $c = n_g \times v_g$ $= \frac{3}{2} \times 2 \times 10^8 \text{ m/s} = 3 \times 10^8 \text{ m/s}$</p> <p>(II) $v_w = \frac{c}{n_w}$</p>	1/2 1/2 1 1/2 1/2 1 1/2 1/2 1/2	

	$= \frac{3 \times 10^8 \text{ m/s}}{\frac{4}{3}} = \frac{9}{4} \times 10^8 \text{ m/s or } 2.25 \times 10^8 \text{ m/s}$	1/2	3
32.	<ul style="list-style-type: none"> • Solenoid –A coil of many circular turns of insulated copper wire wrapped closely in the shape of cylinder. • A current carrying solenoid behaves like a strong bar magnet and when suspended freely, it stays in the geographical north-south direction. • Used in making permanent magnets/electromagnets. 	1 1 1	3
33.	<ul style="list-style-type: none"> • Ecosystem : A structural and functional unit of biosphere comprising all the living organism in an area interacting with non-living constituents of the environment. • (i) Biotic components • (ii) Abiotic components • An aquarium is a man-made (artificial) and incomplete ecosystem without any decomposer as cleaning agent in contrast to a pond/lake which is natural, self-sustaining and complete ecosystem, with decomposers as cleaning agents. 	1 1/2 1/2 1	3
SECTION D			
34.	<p>(a) (i) Propanoic acid (ii) Benzene</p> <p>(b) Homologous series : A series of carbon compounds having similar structure and chemical properties in which the successive members differ by – CH₂ group.</p> <ul style="list-style-type: none"> • CH₃OH, C₂H₅OH, C₃H₇OH <p>(c) An ester is formed</p> <ul style="list-style-type: none"> • Esterification • $\text{C}_2\text{H}_5\text{OH} + \text{CH}_3\text{COOH} \xrightarrow{\text{Acid / H}^+} \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$ 	1/2 1/2 1 1 1/2 1/2 1	5
35.	<p>(a)</p> <p>(i) • Vegetative propagation is an asexual method of reproduction in which old vegetative parts of a plant body such as stem, leaves, roots are used for growing new plants without involving any reproductive organs .</p> <p>Advantages -</p> <ul style="list-style-type: none"> • Can bear flowers and fruits much earlier than those produced from seeds. • Plants that have lost the property to produce seeds can be grown • Genetically similar plants can be grown • Plants of superior quality may be grown 	1	

	<p>• It is a cheaper, easier and rapid method of propagation (any 2)</p> <p>(ii)</p> <table border="1" data-bbox="258 282 1209 734"> <thead> <tr> <th></th> <th>Binary fission</th> <th>Multiple fission</th> </tr> </thead> <tbody> <tr> <td>(i)</td> <td>It is the division of one cell into two similar/identical cells.</td> <td>It is the process in which many daughter cell individuals are formed from a single individual parents cell.</td> </tr> <tr> <td>(ii)</td> <td>In this process, the nucleus first divides into two followed by the division of cytoplasm.</td> <td>In this process, the nucleus of the cell divides repeatedly producing many nuclei.</td> </tr> <tr> <td>(iii)</td> <td>eg. amoeba</td> <td>e.g. Plasmodium Malarial Parasite</td> </tr> </tbody> </table> <p style="text-align: center;">OR</p> <p>(b)</p> <p>(i) (I) Ovary – Production of female gamete (ova) and female hormone. (II) Fallopian Tube – Site of fertilisation and to transfer of zygote into the uterus. (III) Uterus – Implantation of zygote and nourishment to the developing embryo.</p> <p>(ii) • Menstruation: breakdown of uterine lining and its removal along with blood and mucus in a human female, when no fertilization takes place. • Uterine lining is required to nourish the embryo/fertilised egg. In the absence of fertilisation, the lining is not required and hence it sheds in the form of menstruation.</p>		Binary fission	Multiple fission	(i)	It is the division of one cell into two similar/identical cells.	It is the process in which many daughter cell individuals are formed from a single individual parents cell.	(ii)	In this process, the nucleus first divides into two followed by the division of cytoplasm.	In this process, the nucleus of the cell divides repeatedly producing many nuclei.	(iii)	eg. amoeba	e.g. Plasmodium Malarial Parasite	<p>½ , ½</p> <p>1,1,1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>5</p>	
	Binary fission	Multiple fission													
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(iii)	eg. amoeba	e.g. Plasmodium Malarial Parasite													
<p>36.</p>	<p>(a)</p> <p>• Consider a current I flowing through a resistor of resistance R having a potential difference V across its ends. Let t be the time during which charge Q flows across ∴ Work done in moving charge W = VQ ∴ Power input to the circuit by the source $P = \frac{VQ}{t} = VI$ ∴ Energy supplied by the source to the circuit in time t = VIt $= IR \cdot It$ This energy is dissipated in the form of heat if the circuit is purely resistive. $\therefore H = I^2Rt$ This is the required expression for Joule’s law of heating which implies that the heat produced H in a resistor is</p>	<p>½</p> <p>½</p> <p>½</p>													

	(i) directly proportional to square of current (I^2) for given R (ii) directly proportional to resistance (R) for given I (iii) directly proportional to time t for which the current flows through the resistor (b) $H = 200 \text{ J}$, $t = 1 \text{ s}$, $R = 8 \Omega$ (i) Using the formula $H = I^2Rt$, we have $I^2 = \frac{H}{Rt}$ $= \frac{200 \text{ J}}{8 \times 1 \Omega \text{ t}} =$ $= 25$ $\Rightarrow I = 5\text{A}$ (ii) $V = IR$ $= 5\text{A} \times 8 \Omega = 40\text{V}$	½ ½ ½ 1 ½ ½	5
SECTION E			
37.	(a) • due to absorption of heat. (b) • In the presence of sunlight, silver bromide (AgBr) decomposes into silver (Ag) metal and bromine (Br_2) / $2\text{AgBr} \xrightarrow{h\nu} 2\text{Ag} + \text{Br}_2$ (or any other example) (c) • Gas liberated at cathode – hydrogen (H_2) • Gas liberated at anode – oxygen (O_2) • Molar ratio of hydrogen and oxygen liberated on electrolysis of water is 2 : 1 <p style="text-align: center;">OR</p> c) • Brown fumes are produced / Decomposition • $2\text{Pb}(\text{NO}_3)_2 \xrightarrow{\text{heat}} 2\text{PbO} + 4 \text{NO}_2 + \text{O}_2$	1 1 ½ ½ 1 1 1	4
	[Note: Do not cut marks if equation is not balanced]		
38.	(a) • Oestrogen and Testosterone (b) • Anti-stress hormone/ fight fright hormone /Deals with emergency situations like fear, anger, stress anxiety etc. (c) • Growth Hormone: Regulates growth and development of the body • Thyroxin Hormone: Regulates carbohydrate, fat and protein metabolism in the body. <p style="text-align: center;">OR</p> (c) It is the mechanism by which hormones are secreted in the precise quantity as needed by the body. Example If the sugar level in blood rises, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced.	½ , ½ 1 ½ , ½ ½ , ½ 2	4

39.	(a) • Should be slightly more than f / between f and $2f$		1	
	(b) • Virtual • Inverted with respect to object • Magnified	(any two)	$\frac{1}{2}, \frac{1}{2}$	
	(c) • Real • Inverted • Image is of the same size as the object	(any two)	$\frac{1}{2}, \frac{1}{2}$	
	$m = -1$ (Minus one)		1	
	OR			
(c) • Real • inverted • diminished	(any two)	$\frac{1}{2}, \frac{1}{2}$		
$m < 1$ and negative		1		4

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