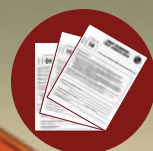


CBSE

Class 10



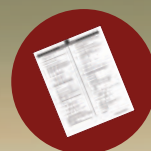
12 **REAL FEEL** SAMPLE PAPERS



**12 Exam
Booklets**



**with 8 CBSE-like
Answer Sheets**



**Comprehensive
Solutions**

SOLUTIONS

2025
Examination

- Exam Ready: Answering Templates That Score
- CBSE Step-wise Marking Scheme Table for Each Question

SCIENCE | MATHEMATICS
SOCIAL SCIENCE | ENGLISH

Adhered to 50% Competency as per CBSE 2024-25 SQP

Chapter-wise Weightage & Trend Analysis

CBSE PAST 5 YEARS' PAPERS

SCIENCE									
CHAPTERS	2020		2021	2022		2023		2024	
	DL	ODL	Exam not Conducted	DL	ODL	DL	ODL	DL	ODL
Chemical Reactions and Equations	5	7		-	-	8	6	7	7
Acids, Bases and Salts	5	5		-	-	8	10	4	5
Metals and Non-metals	5	5		-	-	4	6	8	7
Carbon and its Compounds	5	7		5	5	7	6	6	6
Periodic Classification of Elements (<i>Rationalised</i>)	5	5		5	5	-	-	-	-
Life Processes	5	8		-	-	10	10	5	8
Control and Coordination	3	4		-	-	3	1	6	6
How do Organisms Reproduce?	7	5		6	7	6	5	6	10
Heredity and Evolution (<i>Some portion is Rationalised</i>)	8	6		7	6	6	6	6	1
Light - Reflection and Refraction	9	11		-	-	12	9	7	10
The Human Eye and the Colourful World (<i>Some portion is Rationalised</i>)	3	4		-	-	2	5	5	2
Electricity (<i>Some portion is Rationalised</i>)	7	8		6	6	11	8	7	8
Magnetic Effects of Electric Current (<i>Some portion is Rationalised</i>)	6	2		6	6	5	5	6	8
Sources of Energy (<i>Rationalised</i>)	1	4		-	-	-	-	-	-
Our Environment	4	3		5	5	5	5	4	5
Sustainable Management of Natural Resources (<i>Rationalised</i>)	2	1		-	-	-	-	-	-

*The marks allotment mentioned above is chapter-wise and includes internal choice questions as well. Therefore, the total might not match the Maximum Marks of the respective Previous Year Paper. Here, DL is Delhi, ODL is Outside Delhi.

How to Rock Your Board Exams?



Admit Card: Double-check your admit card before heading to the exam center.



Stationary: Bring pens, pencils, erasers, sharpeners, ruler, and a geometry box. Ensure working pens with sufficient ink and carry spares.



Water bottle and wrist watch: Bring a transparent water bottle for hydration and a wrist watch to monitor time; avoid digital watches which may not be permitted.



Arrive Early at the Examination Center: Arrive before your admit card's reporting time for smooth security checks and room location.



Read the Instructions carefully: Read the instructions of the paper carefully to know the format, marking and special guidelines. Ask the invigilator for any doubts about instructions.



Manage your Time: Assign time for each section/question based on allotted marks and adhere to it for effective time management.



Don't Panic: If you find the paper difficult, remember that everyone else is likely feeling the same way. Stay focused, do your best, and don't let anxiety take over.



Start with your Strengths: Start with your strongest section/question to boost confidence for tougher parts.



Answer clearly and neatly: Write neatly, use headings, subheadings, and bullets for clarity and fetching more marks. Start with margins on both sides. This sets a structured format for your answers.



Don't spend too much time on one question: If a question is challenging or time-consuming, move on and revisit it later if possible. Avoid getting stuck on a single question.



Use of HB pencil: HB pencils produce a relatively dark and easily readable mark. Try to use HB pencils while making diagrams in the exam.



Attempt all questions: Even if unsure, attempt all questions; there is no negative marking in CBSE exams.

INSTRUCTIONS FOR FILLING THE OMR SHEET

- Use a black or blue ballpoint pen to fill the OMR sheet. Pencils or gel pens are not allowed.
- Carefully read the instructions given on the OMR sheet before filling it out.
- While filling the name, leave a block between your first name, middle and last name.
- The student has to fill the following particulars in the answer sheet:

From Admit Card

- | | | | |
|------------------|-------------------------|------------------------|---------------------|
| 1. Subject | 2. Sub Code | 3. Date of Examination | 4. Candidate's Name |
| 5. Father's Name | 6. Roll No. (In digits) | 7. Roll No. (In words) | 8. Centre No. |
| | | 9. School No. | |

From Question Paper

- | | |
|----------------|-----------------|
| 10. Set Number | 11. Code Number |
|----------------|-----------------|

ADMIT CARD



CENTRAL BOARD OF SECONDARY EDUCATION, DELHI

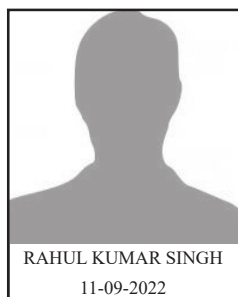
ADMIT CARD FOR SECONDARY EXAMINATION 2024

LATEST ENTRY IN EXAMINATION CENTRE 30 MIN BEFORE THE EXAM START 10 AM (IST)



Roll No. 22122532 **Date of Birth** 26/02/2019 **School No.** 65345 **Centre No.** 8407

Roll No. (In words) TWO CRORE TWENTY ONE LAKH TWENTY TWO THOUSAND FIVE HUNDRED THIRTY TWO ONLY



Examination	SECONDARY - CLASS: 10
Candidate's Name	RAHUL KUMAR SINGH
Mother's Name	REKHA DEVI
Father/Guardian's Name	OM PRAKASH SINGH
of School	*****
Exam Centre	*****
Category of PwD	Not Applicable
Admit Card ID	RR536521



SUB CODE	SUBJECT NAME	MEDIUM	DATE
002	HINDI COURSE-A	...	21.02.2024
184	ENGLISH (LANGUAGE AND LITERATURE)	...	26.02.2024
086	SCIENCE	...	02.03.2024
087	SOCIAL SCIENCE	...	07.03.2024
041	MATHEMATICS STANDARD	...	11.03.2024

QUESTIONPAPER

Series WYXZ1/4



Set No. 2

Q.P. Code 2/4/2

Roll No.

2 2 1 2 2 5 3 2

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

Note: The details provided in the admit card are imaginary; if you found something resembling anyone's details, then it could be by chance.

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI
Secondary School Examination (Class-X)

To be filled in by the candidate as per as per Admit Card

लिखे तथा संगत गीले को पूरे गहरे निशान से भरें।

Write and darken the appropriate circle as applicable.

परीक्षार्थी का नाम बड़े अक्षरों में Candidate's Name in CAPITAL letters

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली
सीनियर स्कूल सर्टिफिकेट परीक्षा (कक्षा दसवीं)

परीक्षार्थी प्रवेश-पत्र के अनसार भरे

विषय Subject: SCIENCE	086
विषय कोड Subject Code:	
परीक्षा का दिन एवं तिथि Day & Date of the Examination: MONDAY 02/03/2024	
उत्तर देने का माध्यम Medium of answering the paper: ENGLISH	

अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या
No. of supplementary answer-book(s) used

विकलांग व्यक्ति: **Person with Disabilities:** हाँ / नहीं **Yes / No**

विकलांगता का कोड (प्रवेश पत्र के अनुसार)
Code of Disabilities (As per the admit card)

क्या लेखन - लिपिक उपलब्ध कराया गया: हाँ / नहीं

Whether writer provided: Yes / No

NO

यदि दृष्टिहीन है तो उपयोग में लाए गये
सोफ्टवेयर का नाम:
If Visually challenged, name of software used:

एक खाने में एक अक्षर लिखें। नाम के प्रत्येक भाग के बीच एक खाना रिक्त छोड़ दें। यदि परीक्षार्थी का नाम 24 अक्षरों से अधिक है, तो केवल नाम के प्रथम 24 अक्षर ही लिखें।
Each letter be written in one box and one box be left blank between each part of the name. In case Candidate's Name exceeds 24 letters, write first 24 letters.

कार्यालय उपयोग के लिए
Space for office use

[illegible]

As per Admit Card

7	1	2	3	4	5	6	7	8	9	0
0	1	2	3	4	5	6	7	8	9	0
4	1	2	3	4	5	6	7	8	9	0
8	1	2	3	4	5	6	7	8	9	0

6	1	2	3	4	5	6	7	8	9	0
8	1	2	3	4	5	6	7	8	9	0
0	1	2	3	4	5	6	7	8	9	0

विषय Subject: SCIENCE	<div style="border: 1px solid black; display: inline-block; padding: 2px;">6</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">5</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">3</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">4</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">5</div>
<p>School No. as per admit card: विद्यालय संख्या जैसा प्रवेश पत्र में दिया गया है।</p>	
अनुक्रमिक (शब्दों में) Roll No. (in words) TWO TWENTY ONE TWENTY TWO Thousands	Lakhs
पिता /संरक्षक का नाम FIVE HUNDRED THIRTY TWO ONLY	
Father's /Guardian's Name: OM PRAKASH SINGH	
परीक्षार्थी के हस्ताक्षर Signature of Candidate: (Candidate's signature in black/blue ballpoint pen)	

इस पृष्ठ पर परीक्षार्थी द्वारा भरे गए सम्पूर्ण विवरण की जाच कर ली गई है।
All the particulars filled in by the candidate on this page have been verified

सहायक अधीक्षक के हस्ताक्षर
Signature of Asstt. Supdt.

अधीक्षक की मोहर
Facsimile sstamp of the Centre supdt.

EXAM READY: ANSWERING TEMPLATES THAT SCORE

SCIENCE

Multiple Choice Question Type

Q. The oxide which can react with HCl as well as KOH to give corresponding salt and water is

- (a) CuO (b) Al_2O_3
(c) Na_2O (d) K_2O

Ans.

Question no.: ____

Answer: (Correct Ans Key)

- Evaluate each option systematically by understanding the key terms and concepts involved.
- After identifying the correct option, write only the corresponding correct answer key.
- There is no need to provide the justification or explanation for this.

Comparison Type

Q. How is the movement of leaves of a sensitive plant different from the downward movement of the roots?

Ans.

The table outlining the difference between _____ and _____

Aspect	Leaves of Sensitive Plant	Downward Movement of Roots
Type of Movement	_____	Geotropism
Dependency	_____	_____
Mechanism	Facilitated by changes in water content within cells.	_____ _____ _____
Trigger	_____	Environmental stimulus (gravity)

In comparison / differentiate / distinguishing type questions, start with a general statement introducing the comparison between the two types of movements. This sets the context and keeps the examiner aware of the focus of your answer.

Avoid paragraphs*: Use a tabular format to compare both types of movements.

Use **comparative language in pairs** to indicate that you're comparing two different things.

Each point should address a different aspect such as **type of movement, dependency, mechanism, and trigger**.

**Use a paragraph format if the comparison-type question awards fewer marks (like 2 marks) or if there are only one or two key differences to mention. You can use the following connecting phrases to make the comparison flow smoothly in a paragraph form: "In contrast", "While", "Unlike", "On the other hand", "Additionally", "However", "Whereas".*

Concept Recall-Justification Type

Q. Name the type of chemical reaction in which calcium oxide reacts with water. Justify your answer by giving balanced chemical equation for the chemical reaction.

Ans.

Calcium oxide (CaO), commonly known as _____, reacts vigorously with water. This reaction produces _____.

The balanced chemical equation for this reaction is as follows:

In this reaction, calcium oxide and water combine to form a _____ product. Such a reaction, _____ reaction.

Introduction: Start by introducing the reactants and products clearly. Ensure to use the correct chemical names and chemical formulae.

Balanced chemical equation: Provide the balanced equation clearly and label each component (reactants and products). Ensure that the equation is balanced in terms of the number of atoms for each element on both sides.

Justification: Clearly identify the type of reaction and provide justification. Use headings and bullet points if needed to organize your answer well.

Analyzing Type

Q. Plants → Deer → Lion

In the given food chain, what will be the impact of removing all the organisms of second trophic level on the first and third trophic level? Will the impact be the same for the organisms of the third trophic level in the above food chain if they were present in a food web? Justify.

Ans.

According to the given food chain,
The first trophic level is represented by: _____
The second trophic level is represented by: _____
The third trophic level is represented by: _____

The impact of removing all the organisms of the second trophic level (_____) would be:

Plants may _____.
Lions would _____.

_____ (Yes/No), If lions were part of a food web instead of a simple chain, the impact

Step-by-Step Analysis: Identify the elements in the question (such as trophic levels in this case) and analyze the relationships between them.

Consider all possible impacts when changes occur (like removing a trophic level).

Justify with Reasoning: Justify your points using logic or scientific principles. If the question asks for comparison (like the impact food chain vs. a food web), explain why one scenario is different from the other.

Conceptual Understanding and Application

Q. Name and state the rule to determine the direction of a:

- (i) magnetic field produced around a current carrying straight conductor.
- (ii) force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it.

Ans.

- (i) The rule to determine the direction of the magnetic field produced around a current carrying straight conductor is _____.

According to this rule, _____.

- (ii) The rule to determine the direction of the force experienced by a current-carrying straight conductor placed in a magnetic field perpendicular to it is _____.

According to this rule, _____.

In subjective questions where answer is of one line or one word, it is better to write the whole sentence.

If question demands explanation or application of any rule then start your answer with "According to _____".

Factual-Function Type

Q. State one role of each of the following in human digestive system:

- (i) Hydrochloric acid
- (ii) Villi
- (iii) Anal Sphincter
- (iv) Lipase

Ans.

The role of _____:

- (i) Hydrochloric acid: Creates an acidic environment which facilitates the action of the enzyme pepsin.

(ii) Villi: _____.

(iii) Anal sphincter: _____.

(iv) Lipase: _____.

• Begin with an introductory sentence.

• In this case, the question directly asks for functions, so the introduction can be skipped.

• If needed in other such questions, you can write something like this.

Start with the subject (in this case "Hydrochloric acid") and directly state its role (in creating an acidic environment for enzyme action.) Follow this for other components *Villi*, *Anal sphincter*, *Lipase*, and ensure you use bullets/underline for highlighting these components.

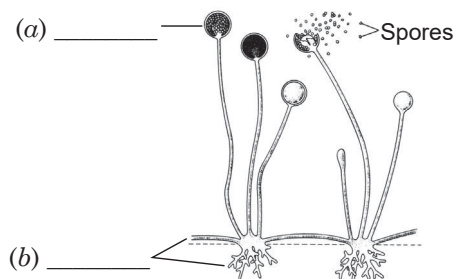
Diagram-Creation Type

Q. Draw a diagram showing spore formation in *Rhizopus* and label the (a) reproductive and (b) non-reproductive parts. Why does *Rhizopus* not multiply on a dry slice of bread?

Ans.

Rhizopus reproduces through _____.

(a) _____



Rhizopus does not multiply on dry bread because _____.

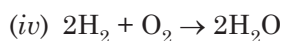
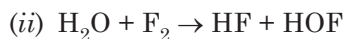
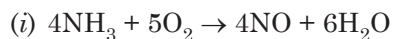
Start with a brief explanation about the subject (if required).

Draw a clear diagram and label all necessary parts as per the question ((a) reproductive and (b) non-reproductive in this case).

If the question asks for reasoning, such as why something happens (e.g., why *Rhizopus* doesn't multiply on dry bread), provide a short and scientifically accurate explanation.

Identification Type

Q. (a) Identify the reducing agent in the following reactions:



(b) Define a redox reaction in terms of gain or loss of oxygen.

Ans.

(a)

(i) Reducing agent: _____.
This is because it is getting _____.

(ii) Reducing agent: _____.
This is because it is getting _____.

(iii) Reducing agent: _____.
This is because it is getting _____.

(iv) Reducing agent: _____.
This is because it is getting _____.

(b)

In a redox reaction, _____ occur simultaneously.

- _____ : The process of gaining oxygen.
- _____ : The process of losing oxygen

• **Identifying specific roles in reactions:** Carefully analyze the given reactions and determine the specific roles asked (e.g., identifying the reducing agent in this case).

• **Justification:** Provide concise reasoning for your identification, linking it to key concepts (such as, linking reducing agent to oxidation i.e., loss of electrons or gain of oxygen in this case).

Key concept explanation: Begin by briefly explaining the key concept or process relevant to the question. (e.g., explaining redox reaction as, where oxidation and reduction occur simultaneously, involving the gain or loss of oxygen).

Cross-Based

Q. In a cross with two pairs of contrasting characters

RRYY × rryy

(Round Yellow) (Wrinkled Green)

Mendel observed 4 types of combinations in F_2 generation. By which method did he obtain F_2 generation?

Write the ratio of the parental combinations obtained and what conclusions were drawn from this experiment.

Ans.

_____ was performed between two pairs of contrasting characters (RRYY × rryy).

Mendel used _____ of F_1 plants to obtain the F_2 generation.

	RY	Ry	rY	ry
RY	RRYY		RrYy	
Ry		RRyy		Rryy
rY	RrYY			
ry		Rryy	rrYy	rryy

The ratio of parental combinations is _____.

Conclusion: This experiment explains the Mendel's Law of _____, where _____.

- **Introduction:** Begin by identifying the type of cross performed.
- Specify the method used (Self pollination in this case)

Diagram: Draw a Punnett square to visually represent the cross and the resulting combinations (Phenotype and Genotype) in the F_2 generation.

- **Observation:** State the phenotypic/genotypic ratio of the observed combinations (Parental in this case) in the F_2 generation.
- **Conclusion:** Summarize the conclusion drawn, focusing on Mendel's laws (Law of Independent Assortment in this case).

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❖ Exam Ready: Answering Templates that Score

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Series C3ABD/1

Physics Wallah  **SET ~ 1**

प्रश्न-पत्र कोड
Q.P. Code 30/1/1

रोल नं. Roll No.							

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

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

नोट/NOTE:

- (i) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 12 हैं।
Please check that this question paper contains 12 printed pages.
- (ii) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 38 प्रश्न हैं।
Please check that this question paper contains 38 questions.
- (iii) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख पृष्ठ पर लिखें।
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.
- (iv) कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें।
Please write down the Serial Number of the question in the answer- book before attempting it.
- (v) 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 परीक्षार्थी केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

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 candidates will read the question paper only and will not write any answer on the answer-book during this period.

गणित (मानक)
MATHEMATICS (STANDARD)



निर्धारित समय: 3 घण्टे
Time allowed: 3 Hours

अधिकतम अंक: 80
Maximum Marks: 80



General Instructions:

Read the following instructions carefully and follow them:

- (i) This question paper contains **38** questions. **All** questions are **compulsory**.
- (ii) This question paper is divided into **five** Sections - **A, B, C, D** and **E**.
- (iii) In **Section A**, Question numbers **1** to **18** are multiple choice questions (MCQs) and question numbers **19** and **20** are Assertion - Reason based questions of **1** mark each.
- (iv) In **Section B**, Question numbers **21** to **25** are very short answer (VSA) type questions, carrying **2** marks each.
- (v) In **Section C**, Question numbers **26** to **31** are short answer (SA) type questions, carrying **3** marks each.
- (vi) In **Section D**, Question numbers **32** to **35** are long answer (LA) type questions, carrying **5** marks each.
- (vii) In **Section E**, question numbers **36** to **38** are **case-study based integrated** questions carrying **4** marks each. Internal choice is provided in **2** marks questions in each case-study.
- (viii) There is no overall choice. However, an internal choice has been provided in **2** questions in Section **B**, **2** questions in Section **C**, **2** questions in Section **D** and **3** questions of **2** marks in Section **E**.
- (ix) Draw neat diagrams wherever required. Take $\pi = \frac{22}{7}$ wherever required, if not stated.
- (x) Use of calculators is **NOT** allowed.

SECTION - A

This section consists of **20** questions of **1** mark each.

20 × 1 = 20

1. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, ($c \neq 0$) are equal, then **1**
 - (a) c and b have opposite sign. (b) c and a have opposite sign.
 - (c) c and b have same sign. (d) c and a have same sign.
2. In a mathematics classroom, the teacher presents a challenge to the students as a practical application of algebraic equations. The task involves identifying the ratio of the digits of a two-digit number, where the number itself is four times the difference between its digits. The students must analyse the properties of numbers and their digits to uncover the ratios that fit this unique requirement. **1**



(a) $\frac{3}{11}$

(b) $\frac{7}{5}$

(c) $\frac{2}{3}$

(d) $\frac{3}{14}$



3. 30th term of the A.P. : 10, 7, 4, ... is 1
 (a) 97 (b) 77 (c) -77 (d) -87
4. The distance between the points $(m, -n)$ and $(-m, n)$ is 1
 (a) $\sqrt{m^2 + n^2}$ (b) $m + n$ (c) $2\sqrt{m^2 + n^2}$ (d) $\sqrt{2m^2 + 2n^2}$
5. The length of the tangent from an external point A on a circle with centre O is 1
 (a) Always greater than OA . (b) Equal to OA . (c) Always less than OA . (d) Cannot be estimated.
6. If $\sin A + \sin^2 A = 1$, then the value of the expression $\cos^2 A + \cos^4 A$ is 1
 (a) 1 (b) $\frac{1}{2}$ (c) 2 (d) 3
7. A rectangular garden has a perimeter of 60 meters. The area of the garden can be expressed as a quadratic function $A(x) = x^2 - 15x$, where x is the width of the garden in meters.



Which of the following equations must Ravi be considering if one of its roots is zero?

Statement I: The roots of the quadratic equation $A(x) = 0$ represent the possible dimensions of the garden.

Statement II: The discriminant of $A(x) = 0$ is positive, indicating two distinct real roots.

Statement III: The sum of the roots of $A(x) = 0$ equals the perimeter of the garden.

Which of the following statements is/are correct? 1

- (a) Only statement I
 (b) Only statement I and II
 (c) Only statement II and III
 (d) All statement I, II and III
8. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots \infty}}}$ is: 1
 (a) 4 (b) 3 (c) 3.5 (d) -3
9. Which term of the sequence 4, 9, 14, 19, ..., 124? 1
 (a) 15 (b) 20 (c) 25 (d) 30



10. Shreya collects the following data on the number of movies watched by her friends in the month of June.

Names	Shailja	Nikita	Arima	Meena	Dune
No. of Movies watched	3	8	9	4	1

What is the average number of movies watched by Shreya's friends in that particular month?

1

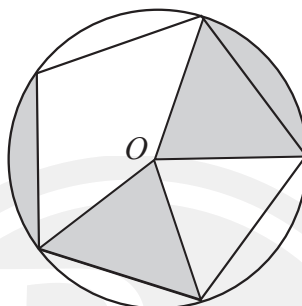
- (a) 4.16 (b) 4.20 (c) 5 (d) 9

11. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is

1

- (a) 4 (b) ± 4 (c) -4 (d) 0

12. A regular pentagon is inscribed in a circle with centre O of radius 5 cm, as shown below:



What is the area of the shaded part of the circle?

1

- (a) $2\pi \text{ cm}^2$ (b) $4\pi \text{ cm}^2$ (c) $5\pi \text{ cm}^2$ (d) $10\pi \text{ cm}^2$

13. The numbers of multiples of 4 between 10 and 250 is

1

- (a) 50 (b) 40 (c) 60 (d) 30

14. The probability that a non-leap year selected at random will contain 53 Sundays is:

1

- (a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{5}{7}$

15. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have

1

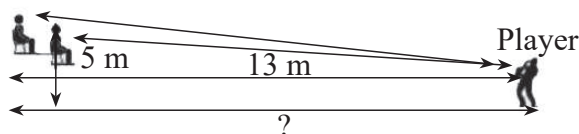
- (a) A unique solution (b) Exactly two solution
(c) Infinitely many solution (d) No solution

16. There are two cylinders of radius ' R ' and ' r ' and having the same height. Find the ratio of their lateral surface areas.

1

- (a) $2 : 3$ (b) $H : h$ (c) $R : r$ (d) None of these

17. Two persons are watching a game in a stadium. The distance between them is 1.5 m.



What is the distance of the second person from the player?

1

- (a) 10 m (b) 12 m (c) 13.5 m (d) 14.5 m



18. A manufacturer finds that the profit P (in thousands of rupees) for producing x units of a product is given by $P(x) = -2x^2 + 60x + 500$. The company decides to donate 20% of its maximum profit to charity.



Statement I: The maximum profit occurs when the production is at the arithmetic mean of the roots of $P(x) = 0$.

Statement II: The amount donated to charity is 50 thousand rupees.

Statement III: The range of production for which the company makes a profit is less than 20 units.

Which of the following statements is/are correct?

1

- (a) Only statement I
- (b) Only statements I and II
- (c) Only statements II and III
- (d) All statements I, II, and III

Directions: In Q. No. 19 and 20 a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of (A).
 - (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 - (c) Assertion (A) is true but Reason (R) is false.
 - (d) Assertion (A) is false but Reason (R) is true.
19. **Assertion (A):** The HCF of two numbers is 18 and their product is 3072. Then their LCM = 169
- Reason (R):** If a, b are two positive integers, then $\text{HCF} \times \text{LCM} = a \times b$. 1
20. **Assertion (A):** If $\cos A + \cos^2 A = 1$ then $\sin^2 A + \sin^4 A = 2$.
- Reason (R):** $1 - \sin^2 A = \cos^2 A$, for any value of A . 1



SECTION - B

This section consists of 5 questions of 2 marks each.

21. (a) Zain is designing a lock with three concentric rings, each marked with numbers from 1 to 60. The lock opens when the numbers on the rings form a geometric sequence and their HCF is a prime number. If the middle number is 12, what is the sum of all three numbers in the sequence? 2

OR

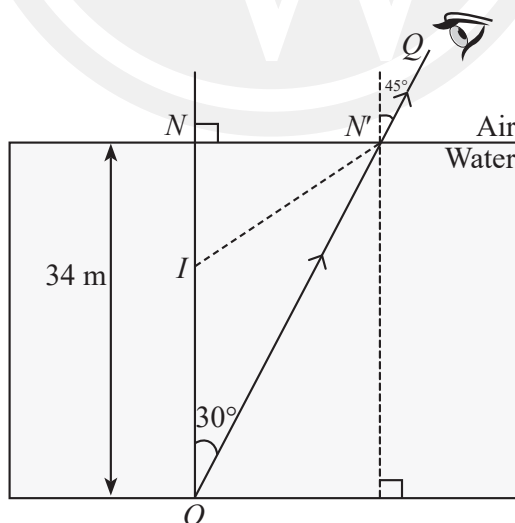
- (b) Given that $\text{HCF}(306, 657) = 9$. Find $\text{LCM}(306, 657)$. 2

22. A city planning team needs to place a water fountain exactly halfway between two playgrounds located at coordinates $(2, -3)$ and $(x, 5)$. The midpoint must also lie on the line $3x + 2y = 7$.



Determine the value of x . 2

23. Shown below is a rectangular tub of water of depth 34 cm. An object O is at the bottom of the tub. The image of the object is formed at I for an observer at Q .

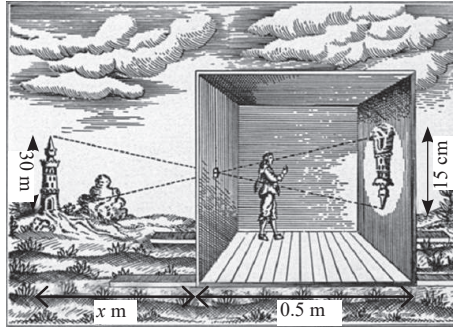


Find the distance by which the object seems to be moved for the observer. Show your work and give valid reasons.

(Note: Take $\sqrt{2} = 1.4$, $\sqrt{3} = 1.7$) 2

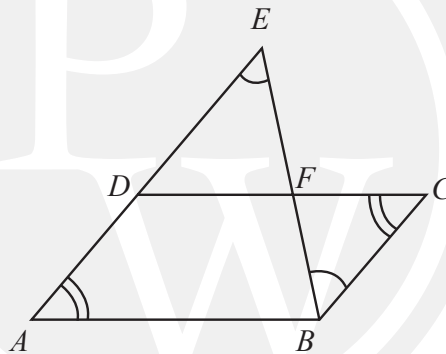


24. A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was ₹ 90, find the number of articles produced and the cost of each article. 2
25. (a) A photographer is using a camera obscura to project an image of a 30 m tall building onto a screen. If the pinhole of the camera is 0.5 m from the screen and the projected image is 15 cm tall, how far is the camera from the building? 2



OR

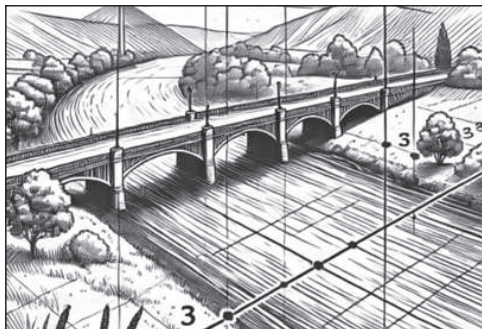
- (b) E is a point on the side AD produced of a parallelogram $ABCD$ and BE intersects CD at F . Show that $\triangle ABE \sim \triangle CFB$. 2



SECTION - C

This section consists of 6 questions of 3 marks each.

26. A river runs along the line $y = 3x + 2$. A bridge needs to be constructed perpendicular to the river such that one end of the bridge is at point $P(4, 14)$.



Determine the coordinates of the point where the bridge ends at $R(x, y)$ if it intersects the river at $Q(1, y)$ and divides the bridge in 2 : 3 at Q . 3



34. (a) A thief and a policeman are running along the same path. The thief starts running with a constant speed of 100 meters per minute. After a one-minute, the policeman begins his chase. In the first minute of his run, the policeman matches the thief's speed at 100 meters per minute. However, every subsequent minute, the policeman increases his speed by 10 meters per minute. How long will it take for the policeman to catch up to the thief? 5



OR

- (b) If the ratio of the sum of first n terms of two A.Ps is $(7n + 1) : (4n + 27)$, find the ratio of their m^{th} terms. 5

35. Find the mean, median and mode of the following data: 5

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

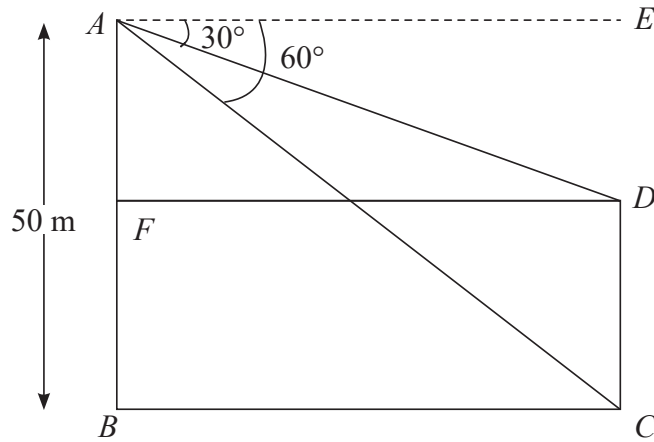
SECTION - E

This section consists of 3 Case-Study Based Questions of 4 marks each.

36. In Bangalore, there are two buildings on either side of a busy road connected by an overbridge. One building is 50 meters high. A man, standing on the top of the 50 -meter high building, observed from the top that the angles of depression to the top and foot of the other building across the road are 30 degrees and 60 degrees, respectively.

(Take $\sqrt{3} = 1.73$)





Based on the given information, answer the following questions:

- (i) What is the measure of $\angle ADF$? 1
- (ii) What is the measure of $\angle ACB$? 1
- (iii) Calculate the width of the road between the two buildings. 2

OR

Determine the height of the other building. 2

37. Sahiba conducted a survey in her school for 150 students of Class 10. She asked the students two multiple choice questions, which were “What time do you go to sleep at night?” and “What is your favourite subject?”. Each student could choose only one option from the choices given. Sahiba tabulated the results from her survey as shown below.



Sleep Schedule	Favourite Subject			
Time	English	Mathematics	Science	Social Science
Before 9 PM	5	7	8	7
9 PM-10 PM	10	12	11	9
10 PM-11 PM	10	12	13	13
After 11 PM	7	8	10	8

(परीक्षार्थी भरें To be filled in by the Student)

परीक्षार्थी प्रश्न-पत्र के ऊपर लिखे कोड को दर्शाए गए बॉक्स में ही लिखें

Student should write code no. as written on the top of

the question paper in the box provided



अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या (यदि कोई)

No. of Supplementary answer book(s) used (if any)

नोट : जो अनुक्रमांक आपको सी.बी.एस.ई. द्वारा दिया गया है, उसे यहाँ भरें।

Note : Roll No. provided by CBSE to be filled here.

अनुक्रमांक

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Roll No.

(अन्तर्राष्ट्रीय अंको में) (In International numeral)

शब्दों में (In words)

कक्षा (Class)

नोट : जो विषय कोड आपको सी.बी.एस.ई. द्वारा दिया गया है, उसे यहाँ भरें।

Note : Subject Code provided by CBSE to be filled here.

विषय कोड Subject Code

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विषय नाम Subject Name

उत्तर देने का माध्यम Medium of answering

परीक्षा का दिन Day of Examination

परीक्षा की तिथि Date of Examination

परीक्षार्थी के हस्ताक्षर Signature of Student

इस पृष्ठ पर परीक्षार्थी द्वारा भरे गए संपूर्ण विवरण की जाँच कर ली गई है।

All the particulars filled in by the Student on this page have been verified-

Q. No.	Marks
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
Total (i)	

Q. No.	Marks
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
Total (ii)	

Grading Scheme

Mark Range	Grade	Grade Point
91-100	A1	10.0
81-90	A2	9.0
71-80	B1	8.0
61-70	B2	7.0
51-60	C1	6.0
41-50	C2	5.0
31-40	D	4.0
21-30	E1	3.0
00-20	E2	2.0

GRADE

--

Grand Total of (i) & (ii)
in figures

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कुल अंक शब्दों में

Total of marks in words



SCIENCE SET-I

(Explanations)

Revision Time : 10 Min

Marking Scheme (Ques 1-20)

30 Min

☞ Each question carries 1 mark.

1. (b) Sheena concludes that since iron lies above Cu in the reactivity series, therefore, it will displace Cu from its salt solution.
2. (d) The balanced chemical equation for the decomposition of lead nitrate ($\text{Pb}(\text{NO}_3)_2$) is:

$$2\text{Pb}(\text{NO}_3)_2(\text{s}) \xrightarrow{\text{Heat}} 2\text{PbO}(\text{s}) + 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$$

(Lead nitrate) (Lead oxide) (Nitrogen dioxide) (Oxygen)
3. (b) The reaction that occurs is:

$$\text{Na}_2\text{SO}_4(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq})$$

Hence, BaSO_4 is present in solid state in the given reaction.
4. (c) He must select calcium sulphate hemihydrate $\left(\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}\right)$ since, it is used for making surfaces smooth.
5. (c) In tamarind and nettle sting, acids present are tartaric acid and methanoic acid respectively.
6. (a)
$$\begin{array}{c} \text{H} \\ | \\ \text{H} - \text{C} - \text{C} \equiv \text{C} - \text{H} \\ | \\ \text{H} \end{array}$$

Propyne
7. (a) Electronic configuration of Na = 2, 8, 1
 Electronic configuration of Cl = 2, 8, 7
 Na will lose an electron (attains positive charge) and Cl will gain one electron (attains negative charge) to achieve stable noble gas configuration.
8. (b) Auxin accumulates on the shaded side of the plant (Side B), promoting cell elongation. This differential growth causes the plant to bend towards the side with less auxin concentration (Side A). This mechanism helps the plant to grow towards light, enhancing photosynthesis efficiency.
9. (a) Valves within the heart act as one-way gates. They open to allow blood flow during contraction and close to prevent backflow, ensuring efficient circulation and maintaining proper blood flow direction.
10. (a) The hindbrain includes the cerebellum, medulla oblongata, and pons.
11. (a) Diagram (a) is correct as it shows the pollen tube growing through the style to the ovary for fertilization.

Only one mature pollen tube is formed during fertilisation and carries male gamete to the egg in the ovary.

12. (a) Tall character is dominant over dwarf (recessive trait) hence in F_1 generation all plants were tall.
13. (a) parallel to the principle axis
14. (a) Both (A) and (B) are correct
15. (b) Image B represents the correct food web of the ecosystem because it accurately sequences the flow of predators and prey, and shows interconnected relationships where one prey has multiple predators, reflecting natural environmental dynamics.
16. (d) Nephron filters blood in the kidney and therefore is called the filtration unit of kidney.
17. (a) The formation of rust on iron is indeed a chemical change. Rust forms when iron reacts with oxygen and water, producing iron oxide. This new substance is chemically distinct from iron, indicating a chemical change has occurred.
18. (a) In the upper stratosphere ozone layer is present, which protects us from harmful ultraviolet (UV) radiations coming from the Sun.
 When CFC reacts with ozone it breaks the molecule of ozone leading to the depletion of this layer and exposing us to harmful radiations.
19. (a) A rainbow appears in the sky after a rain shower because sunlight is dispersed by tiny water droplets in the atmosphere. These droplets act as small prisms, refracting and dispersing sunlight into its component colors. The dispersed light then undergoes internal reflection within the droplets and is refracted again as it exits, creating the spectrum of colors observed in a rainbow.
20. (b) Hybrid is the offspring which have the quality of both the parental generation. One trait should be different for the monohybrid cross.
 The reason is true, but it is not the explanation of assertion, because it is written that Mendel did a monohybrid cross, but the reason of getting hybrid is not mentioned which is recombination.

Marking Scheme

4 Min

- ☞ Identify which arrangement is likely to gather more rust. (1 M)
- ☞ Provide reason to support the answer. (1 M)

Arrangement Y is likely to gather more rust.

This is because:

- Rusting is a surface phenomenon. Arrangement Y has a larger surface area exposed to air.
- Better air circulation: In arrangement Y, there is better air circulation around the blocks, further promoting the rusting process.

22.

Marking Scheme

4 Min

- | |
|---|
| (a) Concerned gland name in the case of patient 1. ($\frac{1}{2}$ M) |
| (b) Concerned gland name in the case of patient 2. ($\frac{1}{2}$ M) |
| Function of concerned gland for patient 2. (1 M) |

- The gland concerned in the case of patient 1 seems to be the thyroid gland.
- The gland concerned in the case of patient 2 might be the adrenal gland.
One of its functions includes secreting adrenaline, which prepares the body for a 'fight or flight' response by increasing the heart rate and supplying more oxygen to muscles.



Key Takeaways

From this question, students will understand the specific roles of endocrine glands and will be able to recognize the connection between symptoms and gland functions, ensuring accurate answers in similar questions.

23.

Marking Scheme

3 Min

- | |
|---|
| Describe the activity (1 M) |
| Name two agents involved in this activity (1 M) |

The butterflies were engaged in pollination which involves transfer of pollen grains from the anther (male reproductive structure) to the stigma (female reproductive structure) of a flower.

Apart from butterflies, water and wind are common agents facilitating this process.

24.

Marking Scheme

3 Min

- | |
|---|
| Correct formula and substitution: (1 M) |
| Final correct answer: (1 M) |

For concave mirror, Given;

Radius of curvature (R) = -20 cm

Object distance (u) = -15 cm

Focal length (f) = $\frac{R}{2} = -\frac{20}{2} = -10$ cm

Using the mirror formula: $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$$\frac{1}{-10} = \frac{1}{v} + \frac{1}{(-15)}$$

$$\frac{-1}{10} = \frac{1}{v} - \frac{1}{15}$$

$$\frac{-1}{10} + \frac{1}{15} = \frac{1}{v}$$

$$\frac{-15+10}{150} = \frac{1}{v}; \frac{-5}{150} = \frac{1}{v} \Rightarrow v = -30 \text{ cm}$$

Therefore, the image distance is 30 cm.



Mistakes 101 : What not to do!

- ☐ Incorrect sign convention for object distance (u) and focal length (f).
- ☐ Incorrect substitution of values in the mirror formula.
- ☐ Incorrect calculation of the image distance (v) using the mirror formula.

25.

Marking Scheme

4 Min

- | |
|--|
| Identifying the correct formula and understanding of ratios: ($\frac{1}{2}$ M) |
| Calculating the area ratio correctly: ($\frac{1}{2}$ M) |
| Substituting values into the resistance formula and calculating the final ratio: (1 M) |

(A) We known, $R = \frac{\rho L}{A}$; \therefore Resistance of a wire is directly proportional to its length and inversely proportional to its cross-sectional area.

Given, the lengths are in the ratio of 1 : 2, and diameters are in the ratio of 2 : 1.

Hence, cross-sectional areas are in the ratio of = 4 : 1.

Therefore, the resistance ratio is

$$\frac{R_1}{R_2} = \frac{l_1}{l_2} \frac{A_2}{A_1} = \frac{1}{2} \times \frac{1}{4} = 1 : 8.$$

OR

Marking Scheme

4 Min

- | |
|---|
| Correct formula and substitution: (1 M) |
| Final correct answer: (1 M) |

(B) Using Ohm's Law, $V = IR$

where V = potential difference, I = current, and R = resistance

Substituting the given values, we get:

$$V = 2A \times 10\Omega = 20V$$

Therefore, the potential difference across the wire is 20V.

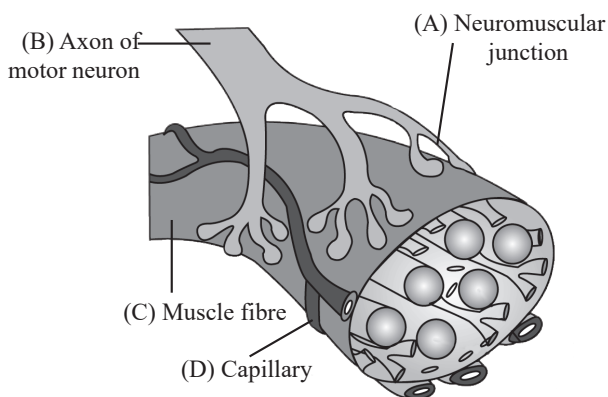


Mistakes 101 : What not to do!

- ❑ Incorrect understanding of the relationship between resistance, length, and cross-sectional area of a wire.
- ❑ Incorrect calculation of the cross-sectional area ratio.
- ❑ Incorrect calculation of the resistance ratio using the length and cross-sectional area ratios.

26.	Marking Scheme	2 Min
	Identifying the figure	(1 M)
	Labeling each part correctly	(1 M)

(A) The figure is showing the neuromuscular junction.



OR

Marking Scheme	2 Min
Mention the differences	(1+1 M)

(B)	Leaves of a sensitive plant	Shoot towards light
	Immediate response to touch and no growth is involved in this movement	Slow and dependent on growth and is caused by elongation of cells on the shaded side of the shoot.
	Movement is due to changes in the amount of water in the cells, causing them to swell or shrink	Movement is due to directional growth of the plant part towards the environmental stimulus (light)

Topper's Explanation

(CBSE, 2023)

a)	Movement of leaves of a sensitive plant	Movement of a shoot towards light
1.	This is not a growth related movement and is due to a stimulus (Nastic movement)	1. This is a growth related movement (Tropic movement)
2.	This is non-directional.	2. This is directional movement
3.	Movement is carried out by movement of water which is taken from the leaves to other part. This causes the leaf to shrink.	3. Movement is carried out due to hormone like Auxin which diffuses to area of shoot away from sunlight and regulates cell elongation in area of shoot present in the shade, which causes the plant to bend towards sunlight.

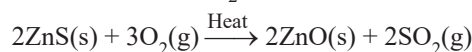
27.	Marking Scheme	5 Min
	Identify the type of ore.	(½ M)
	Name the method used to concentrate this ore.	(½ M)
	Explain the two steps involved in extracting metal from the concentrated ore.	(1+1 M)

Smell of rotten eggs is usually produced by the Sulphur. Therefore, the ore is a sulphide ore.

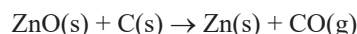
Let us suppose that the ore is Zinc Blende. This sulphide ore is concentrated by froth-floatation process.

The metal is obtained from the concentrated ore in the two steps:

- (i) **Roasting:** Roasting involves heating the ore strongly in the presence of air. The metal sulphide gets converted into metal oxide along with evolution of sulphur dioxide (SO₂) gas.



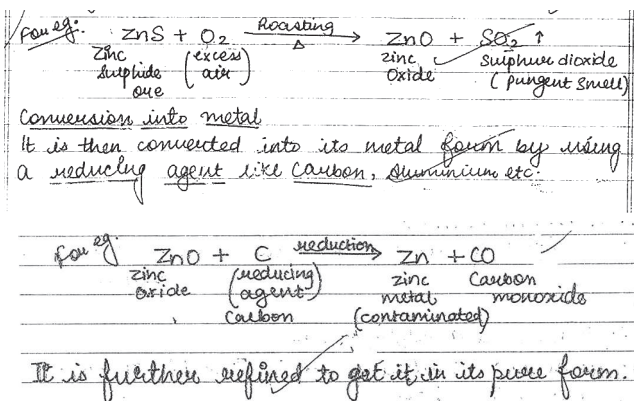
- (ii) **Reduction with carbon:** The metal oxide on heating with carbon, gets reduced to free metal.



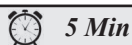
Topper's Explanation

(CBSE 2019)

8.	Smell of rotten eggs is usually produced by Sulphur.
	∴ It must be a sulphide ore.
	let us suppose that the ore is Zinc blende (ZnS).
	Concentration of ore
	First of all, the ore is concentrated by the method of Froth floatation.
	Conversion into metal oxide
	Then it is roasted converted into its metal oxide via Roasting in supply of excess air.



28. Marking Scheme



Provide the following details for the given salts:

Chemical formula	(1 M)
Solubility in water	(½ M)
Effect on blue litmus paper	(½ M)
Name of the acid used to form it	(½ M)
Name of the base used to form it	(½ M)

(A) The chemical formula, their solubility in water, the action on blue litmus paper, and the name of the acids and bases used to form them is given in the following table:

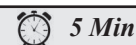
Salt	Chemical formula	Solubility in water	Action on blue litmus paper	Acid used	Base used
Potassium nitrate	KNO_3	soluble	no action	HNO_3	KOH
Aluminium chloride	AlCl_3	soluble	blue to red	HCl	Al(OH)_3
Zinc sulphate	ZnSO_4	soluble	blue to red	H_2SO_4	Zn(OH)_2

Mistakes 101 : What not to do!

Students may mistakenly believe that all salts are neutral in nature, while salts may be acidic or basic in nature depending upon the strength of acids and bases used.

OR

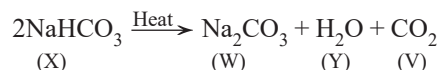
Marking Scheme



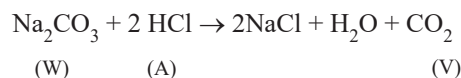
- (a) Identify the nature of aqueous solution of 'W' and 'V' in (i) and (ii). (½ + ½ M)
 Mention the colour change observed in (i) and (ii). (½ + ½ M)
- (b) Identification of the substance Z. (½ M)
 Write the balanced chemical equation for the formation of Z. (½ M)

- (B) • Substance X is likely sodium bicarbonate (NaHCO_3), which is commonly used in antacids and baking.

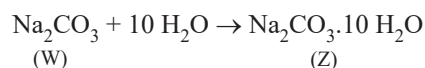
When this substance is heated, following reaction occurs:



- 'W' reacts with an acid such as HCl to produce CO_2 gas ('V')

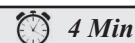


- (a) (i) Methyl orange is red in acidic solution and yellow in basic solutions. The substance 'W' (Na_2CO_3) is a basic salt. Hence, the solution will turn yellow when methyl orange is added to an aqueous solution of 'W'.
- (ii) When CO_2 ('V') is dissolved in water, it forms carbonic acid (H_2CO_3), which is an acidic solution. Acids turn blue litmus red and does not change colour of red litmus, hence, no colour change will be observed if a drop of red litmus solution is added to the aqueous solution of it.
- (b) 'W' upon recrystallisation, forms washing soda (Z), which is used in the manufacture of borax. Hence, the substance 'Z' is washing soda.



29.

Marking Scheme

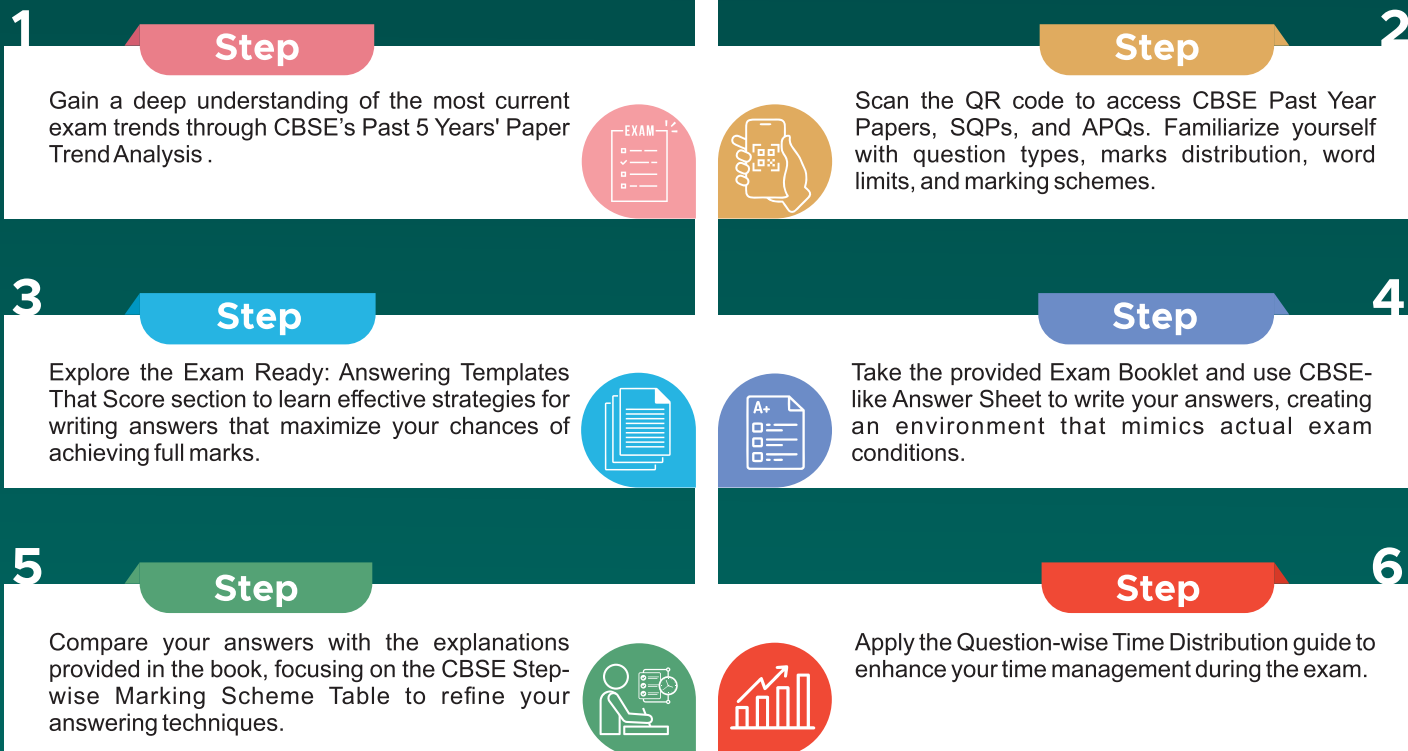


- Three reasons supporting reproduction's importance. (1 + 1 + 1 M)

Reproduction is one of the most important characteristics of living beings. Here are three reasons in support of the statement:

- Continuation of species: Reproduction ensures the continuation of various species on Earth. In the absence of reproduction, species will not be able to exist for a long time and may soon get extinct.
- Genetic variation: Reproduction allows for genetic variations, within a species by introducing new

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