

**CBSE
2026**

EXAMINATION

CLASS 10



8 REAL FEEL SAMPLE PAPERS SOLUTIONS



- 8 CBSE-like Question Booklets
- 8 CBSE-like Answer Sheets
- Solutions with Marking Scheme
- Exam Ready: Answering Templates That Score



- ✓ SCIENCE
- ✓ MATHEMATICS (STANDARD)
- ✓ SOCIAL SCIENCE
- ✓ ENGLISH

New Pattern as per CBSE 2025-26 SQP

Chapter-wise Weightage & Trend Analysis

CBSE PAST 5 YEARS' PAPERS

CHAPTERS	SCIENCE									
	2020		2022		2023		2024		2025	
	DL	ODL	DL	ODL	DL	ODL	DL	ODL	DL	ODL
Chemical Reactions and Equations	5	7	-	-	8	6	7	7	6	6
Acids, Bases and Salts	5	5	-	-	8	10	4	5	6	6
Metals and Non-metals	5	5	-	-	4	6	8	7	6	7
Carbon and its Compounds	5	7	5	5	7	6	6	6	6	6
Periodic Classification of Elements (Rationalised)	5	5	5	5	-	-	-	-	-	-
Life Processes	5	8	-	-	10	10	5	8	8	6
Control and Coordination	3	4	-	-	3	1	6	6	7	7
How do Organisms Reproduce?	7	5	6	7	6	5	6	10	7	7
Heredity and Evolution (Some portion is Rationalised)	8	6	7	6	6	6	6	1	4	5
Light - Reflection and Refraction	9	11	-	-	12	9	7	10	7	6
The Human Eye and the Colourful World (Some portion is Rationalised)	3	4	-	-	2	5	5	2	5	6
Electricity (Some portion is Rationalised)	7	8	6	6	11	8	7	8	6	7
Magnetic Effects of Electric Current (Some portion is Rationalised)	6	2	6	6	5	5	6	5	7	6
Sources of Energy (Rationalised)	1	4	-	-	-	-	-	-	-	-
Our Environment	4	3	5	5	5	5	4	5	5	5
Sustainable Management of Natural Resources (Rationalised)	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.

*For the year 2021, the exam was not conducted.

SOCIAL SCIENCE											
CHAPTERS	2020		2022		2023		2024		2025		
	DL	ODL									
HISTORY											
The Rise of Nationalism in Europe	11	4	-	-	4	4	8	4	4	5	
Nationalism in India	9	10	10	13	8	12	6	8	8	8	
The Making of a Global World (<i>Some portion is Rationalised</i>)	6	4	-	-	3	-	2	3	3	1	
The Age of Industrialisation	1	4	-	-	1	-	-	-	-	-	
Print Culture and the Modern World	4	5	-	-	4	3	4	5	5	6	
GEOGRAPHY											
Resources and Development (<i>Some portion is Rationalised</i>)	7	1	-	-	1	1	1	2	3	2	
Forest and Wildlife Resources (<i>Some portion is Rationalised</i>)	-	-	-	-	-	4	2	4	4	1	
Water Resources	1	1	-	-	5	1	5	2	1	3	
Agriculture (<i>Some portion is Rationalised</i>)	5	2	-	-	3	2	1	6	4	6	
Minerals and Energy Resources	2	5	1	2	3	-	7	2	7	6	
Manufacturing Industries (<i>Some portion is Rationalised</i>)	4	17	5	6	3	6	4	4	1	1	
Lifelines of National Economy	4	6	5	3	5	2	1	1	1	2	
POLITICAL SCIENCE											
Power-sharing	2	-	-	-	2	4	4	5	2	3	
Federalism	8	4	-	-	5	1	5	4	6	6	
Democracy and Diversity (<i>Rationalised</i>)	3	3	-	-	-	-	-	-	-	-	
Gender, Religion and Caste (<i>Some portion is Rationalised</i>)	5	5	-	-	2	2	2	1	2	6	
Popular Struggles and Movements (<i>Rationalised</i>)	8	8	4	5	-	-	-	-	-	-	
Political Parties	5	12	5	12	4	4	4	4	4	2	
Outcomes of Democracy	8	1	10	3	6	5	5	6	6	3	
Challenges to Democracy (<i>Rationalised</i>)	-	-	-	-	-	-	-	-	-	-	
ECONOMICS											
Development	5	6	-	-	5	5	6	5	5	2	
Sectors of the Indian Economy	10	4	-	-	10	4	3	4	5	12	
Money and Credit	5	9	5	5	5	4	5	5	5	3	
Globalisation and the Indian Economy (<i>Some portion is Rationalised</i>)	5	1	5	5	3	6	6	6	5	3	
Consumer Rights (<i>Rationalised</i>)	-	-	-	-	-	-	-	-	-	-	

*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.

*For the year 2021, the exam was not conducted.

CBSE Board Exam 2026: Two-Exam Scheme Decoded

1. What is the major change in Class X Board exams from 2026?

Ans: Starting in 2026, CBSE will conduct two Board exams per year for Class X, one main examination and one for improvement, if desired. This aims to offer students more flexibility and reduce pressure.

2. Why are two Board exams being introduced?

Ans: This is in line with the National Education Policy (NEP) 2020, which emphasizes holistic assessment, focus on core competencies, and reducing rote memorization.

Two Board exams aim to eliminate the high-stress/high-stakes nature of a single final exam and provide students more opportunities to improve.

3. Can I appear for both exams in the same year?

Ans. Yes, you can appear in both exams within the same school year:

First Board Examination (Main Exam)

You must appear in the first Board Examination, as it is mandatory for all students.

Eligible categories:

- Fresh students of Class X
- Students in Compartment (2nd Chance)
- Students repeating the year (Essential Repeat)
- Students appearing for improvement of previous performance

Second Board Examination

You can appear in the second examination in the following cases:

- Improvement: For up to 3 subjects to improve your score.
- Compartment: If you were placed in Compartment in the first phase exam.
- Improvement + Compartment: You can appear for both in May.
- Improvement for the students passed by the replacement of the subject.

Note: You are not allowed to take the second examination if you didn't appear in at least 3 subjects during the first examination. In such cases, you'll fall under the "Essential Repeat" category and have to wait until the next year.

4. When will the exams be held?

Ans. First Phase Examination: 17 February to 6 March 2026

Second Phase Examination: 5 May to 20 May 2026

5. Is it mandatory to attempt the First Phase exam for all students?

Ans. Yes, it is mandatory to attempt the First Phase Exam for all Class X students. It will be treated as the main board examination.

6. Is it mandatory to attempt the Second Phase exam? Who can appear for it?

Ans. No, the May exam is not mandatory. It is an optional attempt meant for:

- Students who want to improve their scores
- Students who were absent or could not perform well in the February exam
- Students who fail in one or more subjects in the first phase

7. Will the syllabus remain the same for both first and second examinations?

Ans. Yes, the syllabus will be the same for both the first and second examinations. Both examinations will be based on the full syllabus prescribed for the academic year.

EXAM READY: ANSWERING TEMPLATES THAT SCORE

SCIENCE

Multiple Choice Question Type

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, _____

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.

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Roll No.

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

NOTE

- (I) Please check that this question paper contains 10 printed pages.
- (II) Please check that this question paper contains 11 questions.
- (III) 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) **Please write down the Serial Number of the question in the answer-book before attempting it.**
- (V) 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.

ENGLISH (Language and Literature)

Time allowed: 3 Hours

Maximum Marks: 80

General Instructions:

Read the instructions very carefully and strictly follow them:

- (i) This question paper contains **11** questions. **All** questions are compulsory.
- (ii) The question paper contains **THREE** sections-

Section – A : Reading Skills

Section – B : Grammar and Creative Writing Skills

Section – C : Literature Text Book

- (iii) Attempt questions based on specific instructions for each part.



SECTION - A

READING SKILLS

(20 marks)

1. Read the following text. (10)

1. Income inequality is a pressing social issue that affects individuals and communities worldwide. It refers to the unequal distribution of wealth and resources among different groups of people. In today's society, the gap between the rich and the poor continues to widen, creating significant disparities in opportunities and living conditions. This passage aims to shed light on the causes, consequences, and potential solutions to income inequality, inviting readers to reflect on the impact it has on our society.
2. To understand income inequality, it is crucial to examine its root causes. One of the primary drivers is the concentration of wealth in the hands of a few individuals or corporations. This concentration is often fueled by factors such as tax policies that favor the wealthy, limited access to quality education and job opportunities for marginalized communities, and systemic biases within the economic system. These factors perpetuate a cycle of inequality, making it challenging for those born into poverty to break free from its grip.
3. The consequences of income inequality are far-reaching and affect various aspects of individuals' lives. Financial instability, limited access to healthcare and education, and increased crime rates are just a few examples. Income inequality also widens the gap between social classes, leading to social unrest and a breakdown in social cohesion. Moreover, it hampers economic growth and perpetuates a cycle of poverty, as those with limited resources struggle to invest in their future and improve their living conditions.
4. Behind the statistics and figures, income inequality has a profound human impact. Imagine a society where hard work and determination are not enough to escape poverty, where opportunities are scarce, and dreams seem out of reach. This reality is the daily struggle for millions of individuals trapped in the cycle of income inequality. It is essential to recognize the inherent value and potential within every person, regardless of their socioeconomic background, and work towards creating a fairer and more inclusive society.
5. Addressing income inequality requires a multi-faceted approach. Governments can play a crucial role by implementing policies that promote wealth redistribution, such as progressive taxation and increased social welfare programs. Additionally, investing in quality education, job training, and affordable housing can empower individuals to break free from the cycle of poverty. It is also vital for businesses and individuals with wealth and influence to contribute to social causes and support initiatives that aim to reduce income inequality.
6. In conclusion, income inequality is a complex social issue that demands our attention and action. By understanding its root causes, recognizing its consequences, and exploring potential solutions, we can work towards creating a more equitable and just society. It is our collective responsibility to strive for a world where everyone has equal opportunities to thrive and succeed, regardless of their socioeconomic background. Let us stand together and advocate for a fairer future.

Answer the following questions, based on the passage above.

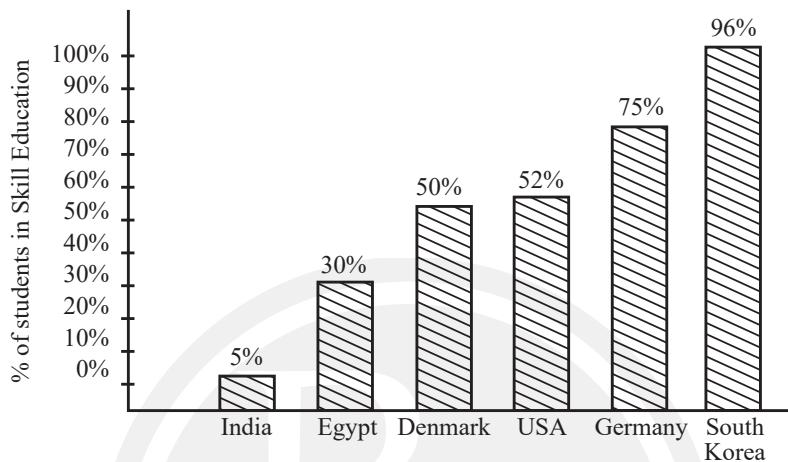
(i) Which of the following best describes the author's attitude towards income inequality? 1

- The author believes income inequality is a natural and unavoidable consequence of economic systems.
- The author believes income inequality is a minor issue that does not significantly impact society.
- The author believes income inequality is a pressing social issue that needs to be addressed.
- The author believes income inequality is a result of individual choices and should not be a concern for society.



- (3) Every child will learn at least one skill and is exposed to several more. This would lead to emphasizing the dignity of labour and importance of various vocations involving Indian arts and artisanship.
- (4) The development of skill capacities will go hand-in-hand with the development of 'academic' or other capacities. To achieve this objective, secondary schools will have to collaborate with Industrial Training Institutes (ITIs), Polytechnics, Local Industry, etc. Skill labs will also be set up and created in the schools in a Hub and Spoke model, which will allow other schools to use the facility. Higher education institutions will offer skill education either on their own or in partnership with industry and other institutions.

The Global Scenario of Students in Skill Education Sector.



For visually challenged students only:

Percentage of students in Skill Education in various countries is as follows:

India	-	5%
Egypt	-	30%
Denmark	-	50%
USA	-	52%
Germany	-	75%
South Korea	-	96%

Based on your understanding of the extract, answer the questions given below:

- (i) Based on the reading of the extract, list 2 objectives of NEP 2020. 1
- (ii) Fill in the blank with appropriate option from those given in the brackets, based on the understanding of paragraph. 1

The statement:

"The development of skill capacities will go hand-in-hand with the development of academic or other capacities" is a/an _____ (fact / opinion) because it is a / an _____ (subjective judgement / objective detail). 1

- (iii) Select the option that corresponds to the meaning of the statement given below:

"According to the policy, by 2025, at least 50% of learners through the school and higher education system shall have exposure to skill education." 1



(A) Maximum 50% learners shall have exposure to technical education.
(B) Minimum 50% learners shall have exposure to technical education.
(C) Minimum 50% learners shall have exposure to skill education.
(D) Maximum 50% learners shall have exposure to skill education.

(iv) Based on the understanding of the passage, complete the following statement appropriately; 1

The benefit of the hub and spoke model will be _____.

(v) Complete the following analogy correctly with a word / phrase from paragraph (3); 1

Racism : condemn :: _____ : respect

(vi) As per the Global Scenario which country has the maximum percentage of students in Skill Education and what can be the possible reason? 1

(vii) Fill in the following blank choosing the most appropriate option from the ones given below:

As per NEP 2020, skill exposure will begin at _____.

(A) middle and secondary school
(B) primary school
(C) higher school
(D) senior secondary school

(viii) Justify the statement - 'The NEP will create an awareness and appreciation of Indian arts and artisanship.' 1

(ix) As per NEP 2020, by which year will at least 50% of learners have exposure to skill education? 1

SECTION - B

GRAMMAR AND CREATIVE WRITING SKILLS

(20 marks)

GRAMMAR

10

3. Attempt ANY TEN of twelve of the following questions.

(i) Fill in the blank by using the correct form of the word in the bracket, for the given portion of a news article.

The new government policy has _____ (impact) the economy, leading to significant changes in the market.

(ii) Read the given sentence from a research paper. Identify the error and supply the correction in the sentence.
The researchers have conducted a series of experiments to test their hypothesis, and the results were showing promising outcomes.

Use the given format for your response.

Error	Correction

(iii) Two friends, Alex and Maya, are discussing their travel plans. Report Alex's question.

I will visit Paris next month.



(iv) Read the dialogue between John and his colleague, Emily, regarding a project deadline.

Emily: Are you confident that we can meet the deadline?

John: Absolutely! We have been working diligently to ensure timely completion.

Select the correct option to complete the reporting of the above dialogue.

Emily asked John _____. John replied that they had been working diligently to ensure timely completion.

- (a) if he was confident that they could meet the deadline
- (b) whether they could meet the deadline confidently
- (c) if they are confident that we can meet the deadline
- (d) whether they were confident in meeting the deadline

(v) Complete the line from a legal document.

All parties involved must submit _____ (a/an/the) signed agreement by the end of the week.

(vi) Identify the error and supply correction for the given sentence from a research paper.

The researchers has conducted a comprehensive study on the effects of climate change.

Use the given format for your response.

Error	Correction

(vii) Select the option that identifies the error and supplies the correction for the following sentence from a technical report.

The new software is designed for enhancing productivity and efficiency on the employees.

Option	Error	Correction
(a)	for	in
(b)	enhancing	enhance
(c)	on	of
(d)	the	no change

(viii) Complete the given narrative, by filling the blank with the correct option.

The thrilling adventure left the explorers feeling _____ by the wonders of nature.

(a) amazing	(b) amazed
(c) amaze	(d) amazement

(ix) Report the dialogue between a detective and a witness, by completing the sentence.

Detective: Did you see anyone suspicious around the crime scene?

Witness: No, I didn't see anyone suspicious around the crime scene.

The detective asked the witness if he had seen anyone suspicious around the crime scene. The witness replied that _____.



(x) Complete the news headline by filling the blank with the correct option.

Breaking News! The government has announced new measures to combat cybercrime.

(xi) Complete the line from a motivational song stanza, by filling the blank with the correct option.

In the face of trials, we stand tall,

Challenges come, but we won't fall.

They _____ our strength, our resilience true,

Through it all, we'll emerge anew.

- (a) test
- (b) tests
- (c) tested
- (d) testing

(xii) Identify the error and supply correction for the following instruction in a technical manual.

Please ensure that the device is properly connect to the power source.

Use the given format for your response.

Error	Correction
11	

WRITING

10

Note: All details presented in the questions are imaginary and created for assessment purpose.

4. Attempt ANY ONE from A and B given below:

5

(A) Write a letter to the local mayor about the issue of inadequate waste management in your community. In your letter, include your identity as a concerned citizen, the address of the local mayor's office, a brief description of the issue, the word limit of 120 words.

OR

(B) Write a letter to the editor of a local newspaper expressing your concern about the lack of cultural diversity in educational institutions. In your letter, include your identity as a concerned citizen and a brief description of the issue. The word limit is 120 words.

5. Attempt ANY ONE from A and B given below:

5

(A) Your school is organising an Eco-Drive to spread awareness about sustainable living. Two environmentalists — Ms. Leena Roy and Mr. Yash Kohli — are interested in being the chief speaker. Read their bios and decide who should be invited.

Ms. Leena Roy

“I’ve worked on urban waste management projects and led cleanliness campaigns in schools. I use stories, visuals, and simple examples to help students understand how they can help the environment in everyday life.”

SAMPLE PAPER SET-1

(Explanations)

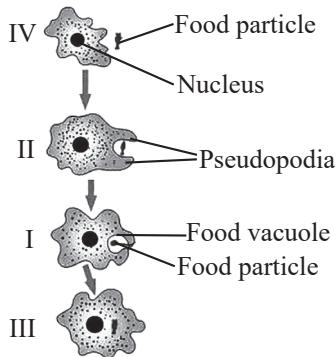
Revision Time : 10 Min

Marking Scheme (Ques 1-9)

 **20 Min**

☞ Each question carries 1 mark.

1. (b) The correct sequence of steps of nutrition in *Amoeba* in the sequential order are as follows:



2. (c) The placenta actually has a large surface area to facilitate the exchange of oxygen and glucose between the mother and the embryo. This area is vital for efficient nutrient and waste exchange during pregnancy.

3. (c) The regular beating of the heart is an involuntary action controlled by the autonomic nervous system. Unlike riding a bicycle, picking up a pencil, or walking, which are voluntary actions requiring conscious effort.

4. (c) When two traits (like shape and colour of seeds) are inherited independently, they follow Mendel's Law of Independent Assortment. This results in a dihybrid cross (where both traits are considered), which typically produces a phenotypic ratio of 9:3:3:1 in the F_2 generation.

5. (c) The incorrect statements are:

(A) The right atrium receives deoxygenated blood through the vena cava, not oxygenated blood through pulmonary artery.
 (D) The left atrium transfers oxygenated blood to the left ventricle, which then sends it to the aorta, not directly from the left atrium to the aorta.

6. (c) In sexual reproduction, offspring receive genetic material from two parents, which leads to genetic variation due to the combination of different alleles. This genetic recombination during fertilization results in more genetic diversity compared to asexual reproduction, where offspring are genetically identical to the parent.

7. (d) In the food web, primary consumers are those that directly consume producers (plants and grass). Mice eat plants and rabbits eat plants and grass, making both mice and rabbits primary consumers.

8. (d) The assertion is incorrect as the pollen tube shows directional growth, not non-directional. The reason is correct because pollen tube growth is guided by positive chemotropism, directing it towards the ovule for fertilization.

9. (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.

10.

Marking Scheme

 **4 Min**

☞ Location of auxin synthesis. **(1 M)**
 ☞ Mention function of auxin in phototropism. **(1 M)**

- Auxins are primarily synthesized in the apical meristem (tips of roots and shoots) and young leaves.
- Auxins promote phototropism by accumulating on the shaded side of the plant in response to light. This unequal distribution causes cells on the shaded side to elongate more than those on the light-exposed side, resulting in the plant bending towards the light source.

11.

Marking Scheme

 **4 Min**

(a) Mention concerned gland name in the case of patient 1.	(½ M)
(b) Mention concerned gland name in the case of patient 2.	(½ M)
Function of concerned gland for patient 2. (1 M)	

(A) (a) The gland concerned in the case of patient 1 seems to be the thyroid gland.
 (b) 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

By answering this question, students will learn about real-life issues that arise when endocrine glands are not functioning properly, highlighting the importance of these glands in maintaining overall health.

OR

Marking Scheme

4 Min

(a) Function of adrenaline.	(1 M)
(b) Adrenaline effect on different body organs	(1 M)

(B) Adrenaline is released suddenly by adrenal glands during stress, preparing the body for 'fight or flight' by activating an emergency mode.

- It increases heart rate, blood pressure, and breathing rate, supplying more oxygen and energy.
- Blood is redirected towards skeletal muscles, while digestion slows.

12. **Marking Scheme**

5 Min

(a) Identify parent genotype using Punnett Square	(1 M)
(b) Mention dominant trait	(½ M)
Mention recessive trait	(½ M)

(a) The possible genotype of the parent guinea pigs is Bb (heterozygous black).

Parents	Bb	×	Bb
Gametes	(B) (b)		(B) (b)
F ₁ generation	♂ (B)	♀ (b)	B b
	B		b
	BB (Black)	Bb (Black)	bb (White)

Phenotypic ratio = 3 : 1
(Black) (White)

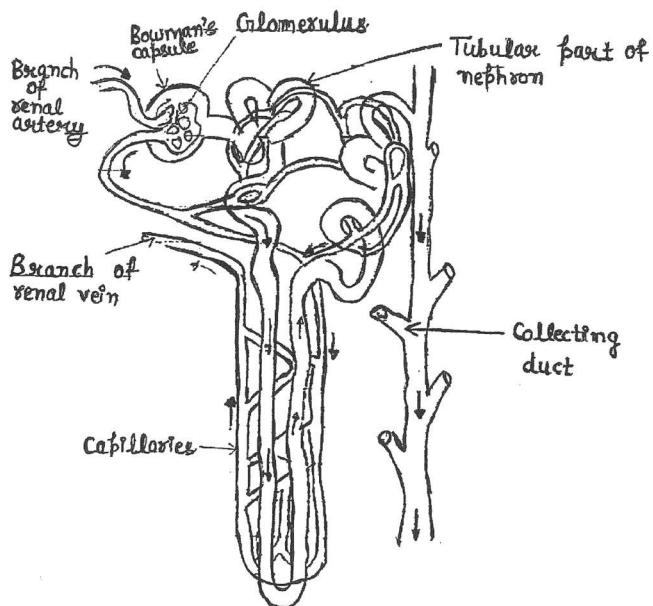
(b) The black trait is dominant, and the white trait is recessive.

The 3 : 1 ratio (75 black: 25 white) suggests a typical Mendelian monohybrid cross, where black (B) is dominant over white (b).

13. **Marking Scheme**

10 Min

Drawing a well labelled image of a nephron. (3 M)



14.

Marking Scheme

5 Min

(a) Mention and justify the method of propagation.	(1 M)
(b) Mention two examples of the plants which can propagate via the method mentioned in (a).	(1 M)

(a) The gardener should adopt vegetative propagation to ensure identical plants. In this method, new plants are produced from the vegetative parts of the parent plant, ensuring uniformity in qualities like leaf size.

(b) Examples of plants:

- Potato
- Bryophyllum*

15.

Marking Scheme

8 Min

(a) Mention the number of trophic levels.	(1 M)
(b) Mention the number secondary consumers with justification.	(2 M)
(c) (i) Name the organism who is eaten most.	(1 M)
	OR
(ii) Mention the organism with maximum DDT concentration	(1 M)

(a) There is a maximum of 5 trophic levels possible when we consider a food chain consisting of grass eaten by grasshopper, grasshopper eaten by either frog or bird and then frog or bird eaten by a snake, and finally snake being eaten by a hawk.

(b) Secondary consumers are organisms that eat primary consumers. According to the given food web, there are 5 organisms that can be classified as secondary consumers.

- The fox, which eats the rabbit and the mouse.
- The hawk, which eats the mouse in one food chain of the food web.

SAMPLE PAPER SET-I

(Explanations)

Revision Time : 10 Min

Marking Scheme (Ques 1-20)

30 Min

Each question carries 1 mark.

1. (b) It is given that, $a = x^3y^2$ and $b = xy^3$, where x, y are prime numbers.

$$\text{L.C.M } (a, b) = \text{L.C.M } (x^3y^2, xy^3)$$

= The highest of indices of x and $y = x^3y^3$

$$\frac{\text{Products of positive integers } (a, b)}{\text{LCM } (a, b)} = \frac{x^3y^2 \times xy^3}{x^3y^3} = xy^2$$

2. (b) Since, A and B are equidistant from O [radii]

$$\therefore AO = BO$$

$A(-1, y), B(5, 7)$ and $O(2, -3y)$

By distance formula

$$\Rightarrow \sqrt{(-1-2)^2 + (y-(-3y))^2} = \sqrt{(5-2)^2 + (7-(7y))^2}$$

$$\Rightarrow \sqrt{(-3)^2 + (y+3y)^2} = \sqrt{(3)^2 + (7+3y)^2}$$

$$\Rightarrow 9 + (4y)^2 = 9 + (7+3y)^2 \text{ [squaring on both sides]}$$

$$\Rightarrow 16y^2 = 49 + 9y^2 + 42y$$

$$\Rightarrow 7y^2 - 42y - 49 = 0$$

$$\Rightarrow y^2 - 6y - 7 = 0$$

$$\Rightarrow y(y-7) + 1(y-7) = 0$$

$$\Rightarrow (y+1)(y-7) = 0$$

$$\Rightarrow y+1 = 0 \text{ or } y-7 = 0$$

$$\Rightarrow y = -1 \text{ or } y = 7$$

\therefore The values of y are $-1, 7$



Nailing the Right Answer

Students should remember that for two points to be equidistant from a third, they must correctly apply the distance formula. They must square both sides to eliminate the radicals and then simplify the resulting equation carefully to solve for the unknown variable.

3. (b) If a pair of linear equations is consistent, then the lines are intersecting or coincident i.e they will have at least one solution or infinitely many solutions.

Given linear equations in two variables is:

$$a_1x + b_1y + c = 0$$

$$a_2x + b_2y + c = 0$$

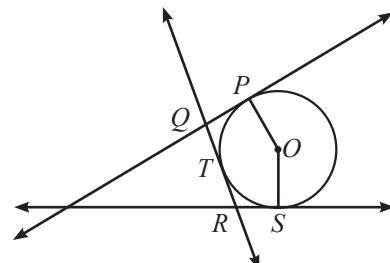
This system of linear equations will have unique solution if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$.

This system of linear equations will have infinitely many solutions if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = 1$.

4. (c) Given that,

$$QR = 12 \text{ cm}$$

$$OP = OS = 7 \text{ cm} \text{ (radii of the same circle)}$$



Now,

$$QP = QT$$

$RT = RS$ (two tangents drawn from an external point to the circle are equal.)

$$QR = QT + TR = 12 \text{ cm}$$

$$QR = QP + RS = 12 \text{ cm} \quad (QP = QT) \quad (RT = RS)$$

$$\text{Perimeter of polygon } PQTRS = QP + RS + QR + OP + OS = 12 + 12 + 7 + 7 = 38 \text{ cm}$$



Mistakes 101 : What not to do!

Students might mistakenly assume all segments from the polygon's perimeter to the circle are tangents without verifying the points of contact. They could incorrectly add the given radius only once instead of both sides where the circle is enclosed.

5. (b) Given $\sec \theta + \tan \theta = p$

$$\Rightarrow \frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta} = p \Rightarrow \frac{1 + \sin \theta}{\cos \theta} = p$$

$$\Rightarrow \frac{(1 + \sin \theta)^2}{\cos^2 \theta} = p^2 \Rightarrow \frac{(1 + \sin \theta)^2}{1 - \sin^2 \theta} = p^2$$

$$\Rightarrow \frac{(1 + \sin \theta)^2}{(1 - \sin \theta)(1 + \sin \theta)} = p^2$$

$$\Rightarrow \frac{1+\sin\theta}{1-\sin\theta} = p^2$$

Applying componendo and dividendo rule

$$\Rightarrow \frac{(1+\sin\theta)+(1-\sin\theta)}{(1+\sin\theta)-(1-\sin\theta)} = \frac{p^2+1}{p^2-1}$$

$$\Rightarrow \frac{2}{2\sin\theta} = \frac{p^2+1}{p^2-1} \Rightarrow \sin\theta = \frac{p^2-1}{p^2+1}$$

$$\therefore \cos\theta = \sqrt{1-\sin^2\theta} = \sqrt{1-\left(\frac{p^2-1}{p^2+1}\right)^2}$$

$$= \sqrt{\frac{(p^4+1+2p^2)-(p^4+1-2p^2)}{(p^2+1)^2}} = \frac{2p}{p^2+1}$$

$$\text{Now } \tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{\frac{p^2-1}{p^2+1}}{\frac{2p}{p^2+1}} = \frac{p^2-1}{2p}$$

6. (d)

$$(a) \text{ Given: } 2(x-1)^2 = 4x^2 - 2x + 1$$

$$\Rightarrow 2(x^2+1-2x) = 4x^2-2x+1$$

$$\Rightarrow 2x^2+2-4x = 4x^2-2x+1$$

$$\Rightarrow 2x^2+2x-1 = 0$$

Which represents a quadratic equation as it can be written in the form of $ax^2+bx+c=0$, $a \neq 0$.

$$(b) \text{ Given: } 2x-x^2 = x^2+5$$

$$\Rightarrow 2x^2-2x+5=0$$

which represents a quadratic equation as it can be written in the form of $ax^2+bx+c=0$, $a \neq 0$.

$$(c) \text{ Given: } (\sqrt{2} \cdot x + \sqrt{3})^2 = 3x^2 - 5x$$

$$\Rightarrow 2 \cdot x^2 + 3 + 2\sqrt{6} \cdot x = 3x^2 - 5x$$

$$\Rightarrow x^2 - (5+2\sqrt{6})x - 3 = 0$$

which also represents a quadratic equation as it can be written in the form of $ax^2+bx+c=0$, $a \neq 0$.

$$(d) \text{ Given: } (x^2+2x)^2 = x^4+3+4x^2$$

$$\Rightarrow x^4+4x^3+4x^2 = x^4+3+4x^2 \Rightarrow 4x^3-3=0$$

Since it can not be written in the form ax^2+bx+c , $a \neq 0$.

Thus, the equation is not quadratic, but it is a cubic equation.

7. (c) Given:

$$\text{Pendulum 1: Length} = \frac{3}{4}R, \text{Angle} = 60^\circ = \frac{\pi}{3} \text{ Radius}$$

$$\text{Pendulum 2: Length} = R, \text{Angle} = 45^\circ = \frac{\pi}{4} \text{ Radius}$$

Arc length of Pendulum 1,

$$l_1 = \frac{3}{4}R \times \frac{\pi}{3} = \frac{\pi R}{4}$$

Arc length of Pendulum 2

$$l_2 = R \times \frac{\pi}{4} = \frac{\pi R}{4}$$

\therefore Both arc lengths are $\frac{\pi R}{4}$.

\therefore The arc lengths of Pendulum 1 and Pendulum 2 are equal.

8. (b) Total number of students, $n(S) = 23$

Number of students in houses A, B and C

$$= 4 + 8 + 5 = 17$$

\therefore Remaining students $= 23 - 17 = 6$

Hence, $n(E) = 6$

So, probability that the selected student is not from A, B and C is

$$P(E) = \frac{6}{23}$$

9. (c) Given, $\tan\theta + \cot\theta = 2$

$$\Rightarrow \tan\theta + \frac{1}{\tan\theta} = 2 \left[\because \cot\theta = \frac{1}{\tan\theta} \right]$$

$$\Rightarrow \tan^2\theta + 1 = 2\tan\theta$$

$$\Rightarrow \tan^2\theta - 2\tan\theta + 1 = 0$$

$$\Rightarrow (\tan\theta - 1)^2 = 0 \Rightarrow \tan\theta - 1 = 0$$

$$\Rightarrow \tan\theta = 1 \Rightarrow \tan\theta = \tan 45^\circ \Rightarrow \theta = 45^\circ$$

Now, $\sin^3\theta + \cos^3\theta = \sin^3 45^\circ + \cos^3 45^\circ$

$$= \left(\frac{1}{\sqrt{2}}\right)^3 + \left(\frac{1}{\sqrt{2}}\right)^3$$

$$= 2\left(\frac{1}{\sqrt{2}}\right)^3 = 2 \cdot \frac{1}{2\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

10. (a) The H.C.F of 30 and p is given as 15, and the L.C.M of 30 and p is 90 (since they meet again at the starting point after 90 minutes).

The relationship between L.C.M and H.C.F is given by:

$$\text{L.C.M}(a, b) \times \text{H.C.F}(a, b) = a \times b$$

$$\text{So, } 90 \times 15 = 30 \times p$$

$$\Rightarrow p = \frac{90}{2} = 45$$

Therefore, the value of p is 45 minutes.



Nailing the Right Answer

Students should know the fundamental relationship between two numbers, their HCF, and their LCM: $\text{HCF} \times \text{LCM} = \text{Product of the numbers}$. They must substitute the given values correctly into this formula to find the unknown value.

11. (b) Given, height of the cylinder (bullet):

$$h = 8 \text{ cm}$$

Outer radius of the cylinder: $R = 1.5 \text{ cm}$

Inner radius (hollow part): $r = 0.5 \text{ cm}$

(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
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

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	
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18	
19	
Total (i)	

Q. No.	Marks
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35	
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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

कुल अंक शब्दों में

Total of marks in words



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