

PM SHRI KV RAJOURI
SUBJECT : MATHEMATICS
SUMMER VACATION HOMEWORK

CLASS X — Board Examination Questions

Textbook : NCERT Mathematics (Class X)

Topics : Ch.1 Real Numbers | Ch.2 Polynomials | Ch.3 Pair of Linear Equations |

Note : To be completed in a separate Holiday Homework Notebook.

SECTION A : Multiple Choice Questions (1 Mark Each)

Chapter 1 — Real Numbers (MCQ)

- Q1.** The HCF of 52 and 130 is: (a) 26 (b) 13 (c) 52 (d) 65 [1M]
Q2. Which of the following is irrational? (a) 0.14 (b) 0.14141414... (c) 0.1416...(non-recurring) (d) 0.1414 [1M]
Q3. The decimal expansion of $17/8$ is: (a) terminating (b) non-terminating repeating (c) non-terminating non-repeating (d) none of these [1M]
Q4. If $\text{LCM}(26, 91) = 182$, then $\text{HCF}(26, 91) = ?$ (a) 13 (b) 26 (c) 7 (d) 91 [1M]

Chapter 2 — Polynomials (MCQ)

- Q5.** If α and β are zeroes of $2x^2 - 5x + 3$, then $\alpha\beta = ?$ (a) $5/2$ (b) $3/2$ (c) $-3/2$ (d) $-5/2$ [1M]
Q6. The number of zeroes of the polynomial whose graph cuts the x-axis at 3 points is: (a) 1 (b) 2 (c) 3 (d) 4 [1M]

Chapter 3 — Pair of Linear Equations (MCQ)

- Q7.** The pair $3x + 2y = 5$ and $6x + 4y = 10$ represents: (a) intersecting lines (b) parallel lines (c) coincident lines (d) perpendicular lines [1M]
Q8. For what value of k does $kx + 3y = 1$ and $6x + ky = 2$ have no solution? (a) 3 (b) -3 (c) 6 (d) -6 [1M]

SECTION B : Very Short Answer Questions (2 Marks Each)

- Q9.** Find HCF and LCM of 8, 9 and 25 by prime factorisation. [2M]

- Q10.** Prove that $5 - 2\sqrt{3}$ is irrational, given that $\sqrt{3}$ is irrational. [2M]
- Q11.** Find the zeroes of $p(x) = 4x^2 - 4x - 3$ and verify the relationship between zeroes and coefficients. [2M]
- Q12.** Find a quadratic polynomial whose zeroes are $(2 + \sqrt{3})$ and $(2 - \sqrt{3})$. [2M]
- Q13.** Solve: $3x - 5y = 4$ and $9x = 2y + 7$ by the substitution method. [2M]
- Q14.** For what value of k will the system $2x + ky = 1$ and $3x - 5y = 7$ have a unique solution? [2M]
- Q15.** Find the roots of $2x^2 - 5x + 3 = 0$ by factorisation. [2M]
- Q16.** Why is $6 \times 7 \times 8 \times 9 + 9$ a composite number? [2M]

SECTION C : Short Answer Questions (3 Marks Each)

- Q17.** Divide $p(x) = x^3 - 3x^2 + 4x - 3$ by $g(x) = x - 2$ and verify the Division Algorithm. [3M]
- Q18.** If α and β are the zeroes of $x^2 - 6x + 4$, find the value of (i) $\alpha^2 + \beta^2$ (ii) $1/\alpha + 1/\beta$ (iii) $(\alpha - \beta)^2$ [3M]
- Q19.** Solve graphically: $x + y = 6$ and $x - y = 2$. Find the area of the triangle formed with the y -axis. [3M]
- Q20.** A fraction becomes $4/5$ when 1 is added to each of the numerator and denominator. It becomes $7/10$ when 1 is subtracted from each. Find the fraction.

SECTION D : Long Answer Questions (5 Marks Each)

- Q21.** Prove that $\sqrt{5}$ is irrational. Use it to prove that $2 - 3\sqrt{5}$ is irrational. [5M]
- Q22.** Draw the graph of $x - y + 1 = 0$ and $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x -axis and find its area.

SECTION E : Case Study Based Questions (4 Marks Each)

- Q23.** [Case Study] The school canteen sells samosas at Rs 8 each and juice at Rs 15 each. On a day, total items sold were 150 and total revenue was Rs 1650. (i) Set up a pair of linear equations. [2M] (ii) Find the number of samosas and juice bottles sold. [2M] [4M]
- Q24.** [Case Study] A factory manufactures two types of screws — Type A and Type B. Type A requires 2 min and Type B requires 3 min on a machine. Machine runs 8 hours/day. A combined order of 200 screws is received. (i) Frame the equations. [2M] (ii) Find the number of each type if machine runs exactly 8 hours. [2M] [4M]

SECTION F : Higher Order Thinking Skills — HOTS (3–4 Marks Each)

- Q25.** [HOT] If α and β are roots of $x^2 - px + q = 0$, form a quadratic equation whose roots are α/β and β/α . [3M]
- Q26.** [HOT] Solve: $(a - b)x + (a + b)y = a^2 - 2ab - b^2$ and $(a + b)(x + y) = a^2 + b^2$. [4M]
- Q27.** [HOT] If one root of $kx^2 - 14x + 8 = 0$ is six times the other, find k . [3M]

CLASS – X: HOLIDAY HOMEWORK (ENGLISH)

1. Read the Chapter – Nelson Mandela (First Flight Book) and write its word meanings, theme, summary and question – answers in English notebook.
2. Read the Poem – How to Tell Wild Animals (First Flight Book) and write its word meanings, theme, summary and question – answers in English notebook.
3. Read the Chapter – The Thief's Story (Footprints Without Feet Book) and write its word meanings, theme, summary and question – answers in English notebook.
4. Do any five (5) Analytical Paragraphs in English notebook.
5. Do any five (5) Reading Comprehension Passages in English notebook.

ग्रीष्मावकाश कार्य

कक्षा दसवीं

विषय:-हिंदी

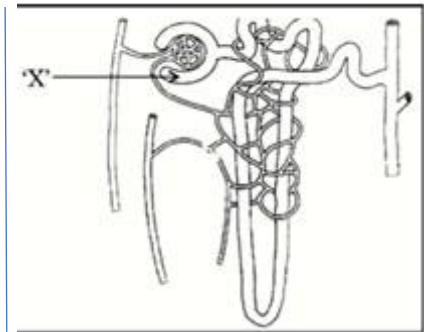
- 1.बीस दिन की छुट्टियों का विवरण देते हुए एक डायरी तैयार करें जिसमें आपकी दिनचर्या का विवरण शामिल हों।
- 2.एक स्व निर्मित प्रेरणादायक कहानी उपयुक्त शीर्षक के साथ तैयार करें। कहानी लगभग 500 शब्दों की होनी चाहिए।
- 3.समाचार पत्र अथवा पत्रिका से दो गद्यांश चुनें और प्रत्येक के पांच -पांच प्रश्न बनाएं और उनके उत्तर दें।
- 4."डिजिटल इंडिया "अभियान अथवा बिना "मोबाइल के एक दिन" पर एक अनुच्छेद लिखिए ।(200-300शब्दों में)
- 5.सूरदास के किसी एक पद का चयन करें उसका सरल हिंदी में भावार्थ 200-250 शब्दों में लिखें।
- 6.रचना के आधार पर वाक्यों के भेद बताइए।

प्रत्येक के दस-दस उदाहरण दें।

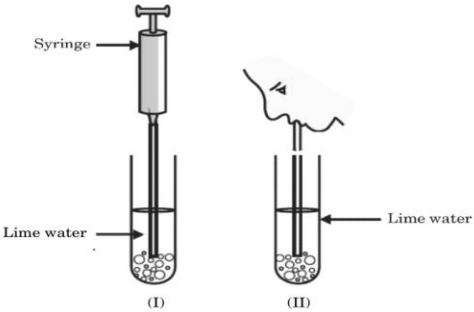
CLASS X HOLIDAYS HOMEWORK

BIOLOGY

- 1. Write any one activity from chapter 1 LIFE PROCESSES in project file**
- 2. Make a chart on any topic from ch.1 life processes.**
- 3. Complete the given assignment**

2 MARKS QUESTIONS	
1(a)	Besides minimising the loss of blood, why is it essential to plug any leak in a blood vessel?
(b)	Name the component of blood which helps in this process and state how this component performs this function. CBSE 2025
2. (i)	The transport system in plants is relatively slower than in animals. Give reasons.
(ii)	State the role of phloem in the transport of materials in plants. CBSE 2025
3.	How is lymph formed? State its important function. CBSE 2025
4 (i)	Identify 'X' in the given diagram of a human nephron and explain its role in the formation of urine.
	
(ii)	Explain why some of the substances are selectively reabsorbed from the initial filtrate as it flows along the tubular part of nephron. CBSE 2025
5	State one role of each of the following in human digestive system: (i) Hydrochloric acid (ii) Villi (iii) Anal Sphincter (iv) Lipase CBSE 2024
6.	Photosynthesis takes place in the leaves and the food prepared by it reaches other parts of the plants. Name the process involved and explain it. CBSE 2024
7.	We need to water the soil in plants on a regular basis. But it ultimately reaches the leaves of the plant. Explain how this takes place? CBSE 2024
8.	Name the type of nutrition exhibited by Amoeba. Explain how food is taken in and digested by this organism. CBSE 2024
9.	Sometimes while running, the athletes suffer from muscle cramps. Why? How is the respiration in this case different from aerobic respiration? CBSE 2024

10	Write the other name given to lymph. State its two functions.	CBSE 2024
	EACH QUESTION CARRY 3 MARKS	
11.	On the basis of the characteristics of the processes given in the brackets in each case, differentiate between the following: (a) Respiration and photosynthesis in plants (gas released) (b) Respiration in terrestrial animals and fishes (organs involved) (c) Products of breakdown of pyruvate in aerobic and anaerobic respiration in human beings (product(s) of the processes)	CBSE 2025
12.	State the enzymes of the following and mention their functions in the process of digestion: Saliva, Pancreatic juice, Bile juice	CBSE 2025
13.	(a) Write the name and one function of respiratory pigment found in human beings. (b) Why do lungs always contain a residual volume of air? (c) Why is ATP known as energy currency of the living beings?	CBSE 2025
14.	Name the blood vessel that brings (i) oxygenated blood (ii) deoxygenated blood, to the human heart. Also name that chamber of the heart which receives deoxygenated blood and state how deoxygenated blood from this chamber is sent to lungs for oxygenation.	CBSE 2025
15.	(i) Why is respiratory pigment needed in multicellular organisms with large body size? (ii) Give reasons for the following: (a) Rings of cartilage are present in the throat. (b) Lungs always contain a residual volume of air. (c) The diaphragm flattens and ribs are lifted up when we breathe in. (d) Walls of alveoli contain an extensive network of blood vessels.	CBSE 2024
16.	(a) Give reasons for the following: - (i) Alveoli in lungs are richly supplied with blood capillaries. - (ii) Respiratory pigment in the blood takes up oxygen and not carbon dioxide. - (iii) During anaerobic respiration, a 3-carbon molecule is formed as an end product instead of CO ₂ in human beings.	CBSE 2024
17.	i) Name the movements that occur all along the gut in human digestive system. How do they help in digestion? (ii) Where is bile juice stored in human body? List two roles of bile juice.	CBSE 2024
18.	(i) What is double circulation? (ii) Why is the separation of the right side and the left side of the heart useful? How does it help birds and mammals?	CBSE 2023
19	(i) How does Paramecium obtain its food? (ii) List the role of each of the following in our digestive system: (a) Hydrochloric acid (b) Trypsin (c) Muscular walls of stomach (d) Salivary amylase	CBSE 2023
	5MARKS QUESTIONS	
20.	(i) “The length of the small intestine in various animals depends on the food they eat.” Justify the statement. (ii) Discuss the role of the pancreas and bile juice in the digestion of food in human beings. (iii) How is the small intestine designed to absorb digested food?	CBSE 2025
21.	State the role of rings of cartilage present in the throat.	

	ii) Discuss the role of the ribs and diaphragm when air is taken in during the breathing cycle. iii) Why do we get muscle cramps during heavy exercise? Explain. CBSE 2025
22.	Design an experiment to demonstrate that carbon dioxide is essential for photosynthesis. Write the observation and conclusion of the experiment. CBSE 2024
23.	 (i) In the experimental set-up shown above in diagram (I) atmospheric air is being passed into lime water with a syringe while in diagram (II) air is being exhaled into lime water. The time taken for the lime water to turn milky in both the test tubes is different. Give reason. (ii) Draw the diagram of an open stomatal pore and label (I) Guard cells, and (II) Chloroplast on it. Mention two functions performed by stomata. CBSE 2024

Class X, Chemistry – Summer Vacation Work

1. Ammonium chloride reacts with sodium hydroxide on heating. Answer the following:

- Which gas is evolved?
- What are the products formed?
- How can the gas be identified?
- Write the balanced chemical equation for the reaction.

2. Metal Mixture with Dilute HCl

A mixture contains iron, zinc, and copper and is added to dilute hydrochloric acid.

- Which metals will react and why?
- Write balanced chemical equations for possible reactions.
- Why does copper not react with dilute HCl?
- Arrange the metals in order of reactivity based on observations.

3. Hydrogen Peroxide Decomposition

Hydrogen peroxide decomposes in the presence of MnO_2 .

- i) Write the balanced chemical equation.
- ii) What gases are produced?
- iii) Is this an oxidation, reduction, or redox reaction? Explain.
- iv) Why is MnO_2 used in this reaction?

4. Neutralisation Reaction

Hydrochloric acid is added to sodium hydroxide solution with phenolphthalein indicator.

- i) What colour change is observed?
- ii) What is formed after the reaction?
- iii) Write the balanced chemical equation.
- iv) Why is this called a neutralisation reaction?

5. Indicator Behaviour

Red and blue litmus paper are dipped in acid and base solutions.

- i) What happens to red litmus in a base?
- ii) What happens to blue litmus in an acid?
- iii) Which indicator turns pink in acidic solution?
- iv) Why are indicators important in chemistry?

6. Case Study: Rusting of Iron

A student observes rusting of iron in different conditions:

A: Dry air

B: Moist air

C: Water + salt

- i) In which condition is rusting fastest? Why?
- ii) Write the chemical equation for rusting.
- iii) Is rusting a chemical or physical change? Explain.
- iv) How can rusting be prevented?

7. Reaction Identification

A student performs four reactions:

A: Baking soda + vinegar

B: Iron + copper sulfate

C: Burning of magnesium

D: Calcium oxide + water

i) Classify each reaction type.

ii) Which are redox reactions?

iii) Which reactions produce gas evolution?

iv) Write balanced equations for all reactions.

v) Which reaction shows temperature increase?

8. Strength vs Concentration of Acids

Two solutions:

A: Dilute hydrochloric acid

B: Dilute acetic acid

(Both have same concentration)

i) Which is a strong acid and why?

ii) Which has lower pH?

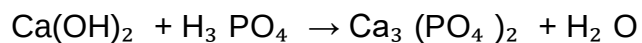
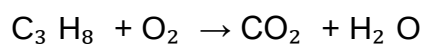
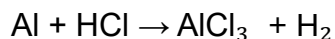
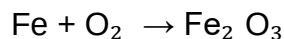
iii) Write dissociation equations for both in water.

iv) Why do both conduct electricity differently?

v) Which reacts faster with zinc? Explain

9. Balancing Equations + Reaction Type

Balance the following equations and identify reaction type:



i) Which are combustion reactions?

ii) Which involve displacement reactions?

iii) Which are neutralisation reactions?

HOLIDAY HOMEWORK (Class X)

Subject: Social Science

 *Chapters Covered:*

1. Rise of Nationalism in Europe

2. Power Sharing

3. Resources and Development

1. Rise of Nationalism in Europe

* Explain the concept of nationalism

* Describe the French Revolution and its impact on nationalism

* Explain the role of culture in the growth of nationalism

* Describe the unification of Germany

* Describe the unification of Italy

* Write short notes on:

* Balkan region

* Role of women in nationalist movements

2. Power Sharing

- * Define power sharing
- * Explain the forms of power sharing
- * Describe horizontal and vertical division of power
- * Explain why power sharing is important in a democracy
- * Give examples of power sharing in India

3. Resources and Development

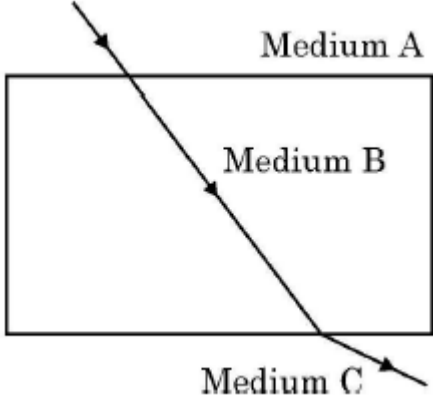
- * Define resources
- * Explain the types of resources
- * What is sustainable development?
- * Describe resource planning in India
- * Write measures for conservation of resources

Solve previous year questions on these topics.

Previous Year's Board Examination and Important Questions
Class – X(Physics)
Chapter – Light -Reflection and Refraction

2 Marks Questions	
1	An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm. Use lens formula to find the position of the image formed in this case. CBSE-2025
2	An object is placed at a distance of 30 cm in front of a concave mirror of focal length 20 cm. Use mirror formula to determine the position of the image formed in this case. CBSE-2025
3	A ray of light after refraction from a convex lens emerges parallel to its principal axis. (i) Draw a labelled ray diagram to show it. (ii) In this case, the incident ray before refraction from the lens passes through a point on its principal axis. Name the point. CBSE-2025
4	The values of absolute refractive indices of kerosene and water are 1.44 and 1.33 respectively. Compare the two media on the basis of their – (a) Optical density (b) mass density (c) relative speed of propagation of light. What do you infer on the basis of above comparisons? CBSE-2025
5	During an experiment, a student observes that the given mirror is forming an erect and diminished image for all positions of the object in front of it. Based on this information answer the following questions – (a) Identify the mirror. (b) Using new Cartesian sign convention write magnitude of the magnification in this case. (c) What will be the radius of curvature of the mirror if its focal length is 20 cm? CBSE-2025
6	Define the term absolute refractive index of a medium. A ray of light enters from vacuum to glass of absolute refractive index 1.5. Find the speed of light in glass. The speed of light in vacuum is 3×10^8 m/s. CBSE-2024
7	The heat produced at a point due to concentration of sunlight by a convex lens burns a paper. (a) Explain why it happens. (b) Name the term (in the context of the lens used) given to the point at which the paper starts burning. What does the bright spot formed on the paper represent? CBSE-2024
8	(a) A ray of light starting from diamond is incident on the interface separating diamond and water. Draw a labelled ray diagram to show the refraction of light in this case. (b) Absolute refractive indices of diamond and water are 2.42 and 1.33 respectively. Find the value of refractive index of water w.r.t. diamond. CBSE-2023
3 Marks Questions	
9	Draw ray diagrams to show the nature, position and relative size of the image formed by a

	convex mirror when the object is placed (i) at infinity and (ii) between infinity and pole P of the mirror. CBSE-2025
10	A convex lens forms an 8.0 cm long image of a 2.0 cm long object which is kept at a distance of 6.0 cm from the optical centre of the lens. If the object and the image are on the same side of the lens, find (i) the nature of the image, (ii) the position of the image, and (iii) the focal length of the lens. CBSE-2025
11	An object is placed at a distance of 20 cm from the optical centre of a concave lens and its image is formed on the same side of the lens as the object. If the distance of the image from optical centre of the lens is 10 cm, use lens formula to determine (i) focal length, and (ii) power of the lens in new Cartesian sign conventions. CBSE-2025
12	A convex mirror used for rear view on an automobile has a focal length of 1.5 m. If a 3 m high bus is located at 6.0 m from the mirror, use mirror formula to determine the position and size of the image of the bus as seen in the mirror. CBSE-2025
13	If we want to obtain a virtual and magnified image of an object using a concave mirror of focal length 18 cm, where should the object be placed? Use mirror formula to determine the object distance for an image of magnification +2 produced by this mirror and justify your answer. CBSE-2025
14	The power of a lens is -0.25 D. Based on this information find out – (a) The type of lens and its focal length. (b) The eye defect for which it may be used as corrective lens. (c) The nature and size of the image formed by this lens when an object is placed between F and 2F from the optical centre of this lens. CBSE-2025
15	(i) The image of an object formed by a mirror is real, inverted and is of magnification-1. If the image is at a distance of 30 cm from the mirror, where is the object placed? Give reason to justify your answer. (ii) Where would the image be if the object is moved 15 cm towards the mirror? Draw ray diagram for the new position of the object to justify your answer. CBSE-2024
5 Marks Questions	
16	(i) The power of a lens 'X' is -2.5 D. Name the lens and determine its focal length in cm. For which eye defect of vision will an optician prescribe this type of lens as a corrective lens? (ii) "The value of magnification 'm' for a lens is -2 ." Using new Cartesian Sign Convention and considering that an object is placed at a distance of 20 cm from the optical centre of this lens, state: (I) the nature of the image formed; (II) size of the image compared to the size of the object; (III) position of the image, and (IV) sign of the height of the image. (iii) The numerical values of the focal lengths of two lenses A and B are 10 cm and 20 cm respectively. Which one of the two will show higher degree of convergence/divergence? Give reason to justify your answer. CBSE-2025
17	(i) Draw a ray diagram to show the refraction of a ray of light through a rectangular glass slab when it falls obliquely from air into glass. (ii) State Snell's law of refraction of light.

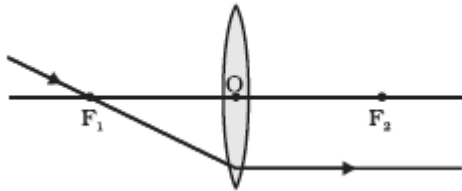
	(iii) Differentiate between the virtual images formed by a convex lens and a concave lens on the basis of : (I) object distance, and (II) magnification. CBSE-2025
18	(i) A student wishes to study the image formation by a concave mirror using candle flame as object. State the type of the image formed by the mirror and mention the change in the image formed, if any, that he observes when the candle flame is gradually moved away from the pole of the mirror. Draw a ray diagram to show the image formation when the object distance is nearly equal to the radius of curvature of the mirror. (ii) A convex mirror used for rear-view on an automobile has a focal length of 3.0 m. If a bus is located at 6.0 m from this mirror, use mirror formula to find the position of the image of the bus as seen in the mirror. CBSE-2025
19	(a) Observe the following diagram to compare (i) speed of light and (ii) optical densities of three media A, B and C. Also give justification for your answer of any one of the two cases in terms of refractive indices of A, B and C.  (a) Redraw the path of ray of light through the three media, if the ray of light starting from media A fall on the B (i) Obliquely and the optical density of medium B is made more than that of A and C. (ii) The ray falls normally from medium A to medium B. CBSE-2025
20	Analyse the following observation table showing variation of image distance (v) with object distance (u) in case of convex lens and answer the questions that follows without doing any calculations:

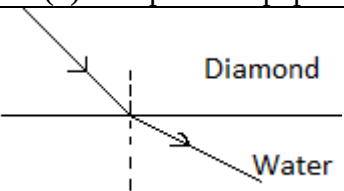
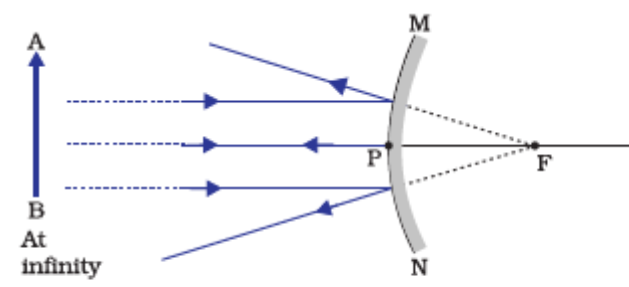
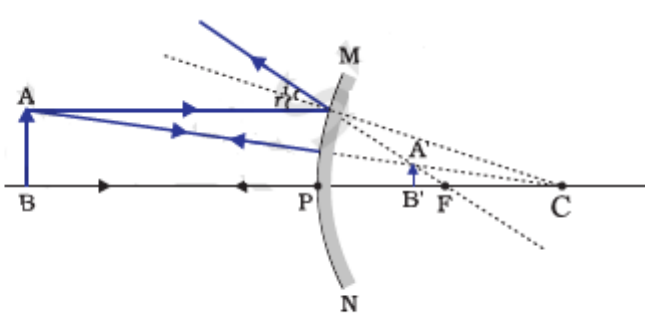
Observation Number	Object distance (u) in cm	Image distance (v) in cm
1	-15	-60
2	-25	+100
3	-30	+60
4	-40	+40
5	-60	+30
6	-100	+25

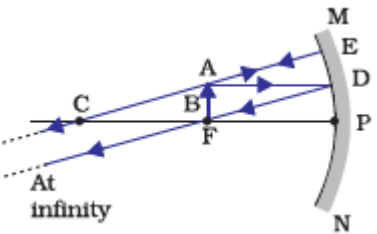
(i) Determine the focal length of lens. Give reason for your answer.
(ii) Find magnification of the image formed in observation no. 3.
(iii) The numerical value of magnification in case of observations 1 and 2 is same. List two differences in the image formed in these two cases.
CBSE-2025

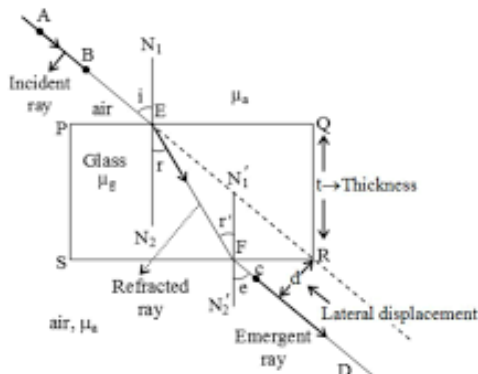
ANSWER KEY

Answer key 2 Marks Questions

1	Given, $u = -60$ cm $f = -30$ cm, to find, $v = ?$ using lens formula, $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{f} + \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{-30} - \frac{1}{60}$ or, $\frac{1}{v} = -\left(\frac{1}{30} + \frac{1}{60}\right) = -\frac{3}{60} = -\frac{1}{20}$ therefore, $v = -20$ cm
2	Given, $u = -30$ cm $f = -20$ cm, to find, $v = ?$ Using mirror formula, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{-20} - \frac{1}{-30}$ or, $\frac{1}{v} = -\frac{1}{20} + \frac{1}{30} = -\frac{1}{60}$ therefore, $v = -60$ cm
3	(i)  (ii) First Focus of lens.
4	(a) kerosene is optically denser than water. (b) Mass density of kerosene is lower than water as it floats on water. (c) Speed of light in kerosene is less in kerosene as its refractive index is more than water.
5	(a) Convex mirror

	(b) Magnification is positive and less than 1. (c) As $R = 2f$, $R = +40$ cm
6	Absolute Refractive Index: -The refractive index of any medium with respect to vacuum or air is called its absolute refractive index. Given, $c = 3 \times 10^8 \text{ ms}^{-1}$, $n = 1.5$, speed of light in glass (v) = ? As, we know, $n = \frac{c}{v}$, therefore, $v = \frac{c}{n} = \frac{3 \times 10^8}{1.5} = 2 \times 10^8 \text{ ms}^{-1}$
7	(a) Convex lens converges parallel beam incident on it at the principal focus due to which heat is produced and paper start burning. (b) The point on paper is called principal focus point of the lens. Bright spot is image of sun.
8	 Given, refractive index of diamond $n_1 = 2.42$, refractive index of water $n_2 = 1.33$ As refractive index of second medium with respect to first medium (n_{21}) is $n_{21} = \frac{n_2}{n_1}$, therefore, $n_{21} = \frac{1.33}{2.42} = 0.55$
Answer key 3 Marks Questions	
9	 (a)  (b)
10	Given that, $h' = 8$ cm, $h = 2$ cm, $u = -6$ cm, To find (i) nature of the image, (ii) position of the image and (iii) focal length of the lens (i) As image is formed on the same side of the lens it is virtual and erect. (ii) Using linear magnification formula, $m = \frac{h'}{h} = \frac{8}{2} = +4$, as, $m = \frac{v}{u}$ or, $4 = \frac{v}{-6}$ hence, $v = -24$ cm using lens formula, $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ or, $\frac{1}{f} = \frac{1}{-24} - \frac{1}{-6}$ or, $\frac{1}{f} = \left(\frac{1}{6} - \frac{1}{24}\right) = \frac{3}{24} = \frac{1}{8}$, therefore, $f = +8$ cm
11	Given that, $u = -20$ cm, $v = -10$ cm, To find (i) focal length of the lens (ii) Power of the lens (i) Using lens formula, $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ or, $\frac{1}{f} = \frac{1}{-10} - \frac{1}{-20}$ or, $\frac{1}{f} = \left(\frac{1}{20} - \frac{1}{10}\right) = \frac{1-2}{20} = -\frac{1}{20}$, therefore, $f = -20$ cm (ii) Using formula, $P = \frac{1}{f(\text{in m})} = \frac{100}{f(\text{in cm})} = \frac{1}{-0.20} = -\frac{100}{20} = -5D$
12	Given, $u = -6$ m $f = +1.5$ m, height of the bus $h = 3.0$ m, To find, (i) position of the bus in the mirror, $v = ?$ (ii) Size of image of the bus, $h' = ?$ (i) Using mirror formula, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{1.5} - \frac{1}{-6}$ or, $\frac{1}{v} = \frac{2}{3} + \frac{1}{6} = \frac{5}{6}$ hence, $v = \frac{6}{5} = 1.2$ m therefore, $v = +1.2$ m

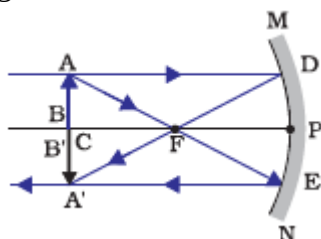
	(ii) Using linear magnification formula, $m = \frac{h'}{h} = -\frac{v}{u}$ or, $h' = -\frac{v}{u} \times h = -\frac{1.2}{-6} \times 3 = +0.6 \text{ m}$
13	Given, $f = -18 \text{ cm}$, linear magnification, $m = +2$, distance of object, $u = ?$ (a) As focal length of concave mirror is 18 cm, to get the virtual and magnified image object should be placed between pole and the focus of the mirror. (b) $m = -\frac{v}{u}$ or, $+2 = -\frac{v}{u}$ therefore, $v = -2u$; now using mirror formula, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or, $\frac{1}{-18} = \frac{1}{-2u} - \frac{1}{u}$ or, $-\frac{1}{18} = \frac{1}{-2u} + \frac{1}{u}$ or $-\frac{1}{18} = \frac{1}{u}$, hence, $u = -18 \text{ cm}$
14	Given, $P = -2.5\text{D}$ (a) The given lens is a concave or diverging lens, Using formula, $P = \frac{1}{f(\text{in m})}$ or $f = \frac{1}{P} = \frac{1}{-2.5} = -0.4 \text{ m} = -40 \text{ cm}$ (b) Myopia (c) Image formed is Virtual and erect, image is diminished (smaller than size of object)
15	(i) As the image formed is real and inverted the mirror is concave. Since magnification is -1 the distance of image and object is same therefore object distance is -30cm. The object is placed at centre of curvature. (ii) If object is 15 cm towards mirror it is now at the focus of the mirror and image is formed at infinity. 
Answer key 5 Marks Questions	
16	Given, $P = -2.5\text{D}$ (i) The given lens is a concave or diverging lens, Using formula, $P = \frac{1}{f(\text{in m})}$ or $f = \frac{1}{P} = \frac{1}{-2.5} = -0.4 \text{ m} = -40 \text{ cm}$ This lens can be used to correct Myopia. (ii) Given magnification, $m = -2$ and $u = -20 \text{ cm}$ (I) Image is real and inverted (II) Size of the image is twice as the size of object (III) $m = \frac{v}{u}$ or, distance of image, $v = m u = -2 \times -20 = +40 \text{ cm}$ (IV) Negative (iii) As the degree of convergence is inversely proportional to the focal length (directly proportional to the power of the lens.) the divergence or convergence will be more in case of lens of focal length 10 cm.
17	(i)



- (ii) Snell's Law : - The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for the given pair of media.
- (iii) (I) object distance in case of convex lens is greater than 0 and less than f, for concave lens the object distance is greater than 0 and less than infinity.
 (II) magnification is greater than 1 and positive in convex lens, while it is less than one and positive in concave lens

18

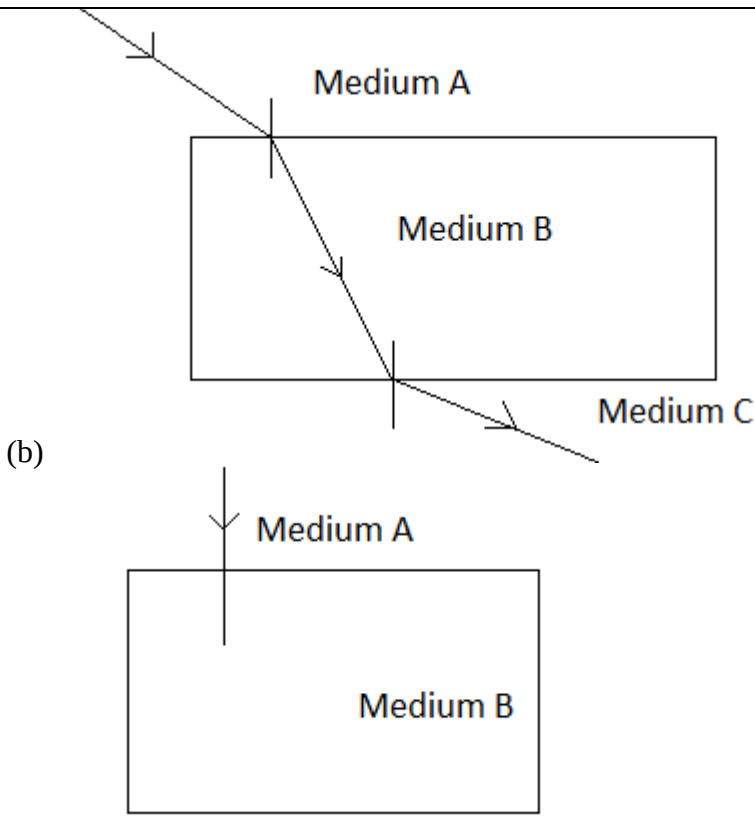
- (i) Both virtual and real images will be formed, when candle is moved upto focus point the image formed is virtual, erect and enlarged, after focus point image will be real and inverted and size of image increases and becomes equal at centre of curvature afterward the size of image increases.

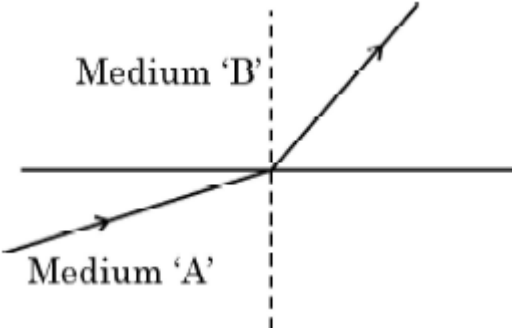
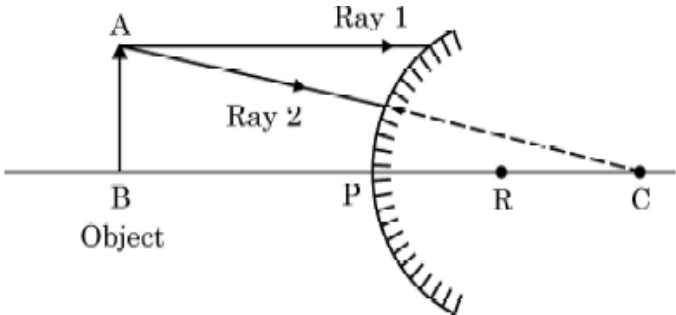


- (ii) Given, $u = -6 \text{ m}$ $f = +3 \text{ m}$, height of the bus $h = 3.0 \text{ m}$,
 To find, (i) position of the bus in the mirror, $v = ?$ (ii) Size of image of the bus, $h' = ?$
 (iii) Using mirror formula, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$ or, $\frac{1}{v} = \frac{1}{3} - \frac{1}{-6}$ or, $\frac{1}{v} = \frac{1}{3} + \frac{1}{6} = \frac{3}{6}$
 hence, $v = 2.0 \text{ m} = 2 \text{ m}$ therefore, $v = +2 \text{ m}$

19

- (a) $v_A = v_B < v_C$ and $n_A = n_B > n_C$, as light is not deviated when passes from medium A to B refractive indices and speeds of light in these media is same. As light passes from medium B to C it moves away from normal the refractive index of medium C is less compared to media A and B and speed of light is more in medium C.

	 (b) (c)
20	(i) When object is placed at 40 cm image is also formed at 40 cm. In this case object is placed at $2f$ therefore focal length of the lens is +20 cm. (ii) The magnification in observation 3 is -2. (iii) In case 1 image formed is virtual and erect and it is behind the object i.e on the same side of the lens. In case 2 image formed is real and inverted and on the opposite side of the lens.
QUESTIONS FOR PRACTICE	
2 MARKS QUESTIONS	
1	An object is placed at a distance of 10 cm in front of a concave mirror of focal length 15 cm. Use mirror formula to determine the position of the image formed by this mirror. CBSE-2025
2	When an incident ray enters in a medium X from air, it bends towards normal. Infer about the following with respect to air – (A) Optical density of medium X (B) Speed of light through medium X Give reason for your answer in each case. CBSE-2025
3	An object placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position of image formed by mirror. CBSE-2025
4	A ray of light falls making an angle of incidence θ on the surface of the glass slab. Draw a labelled ray diagram to show its path. Also mark lateral displacement on it. CBSE-2025
5	Out of the two lenses, one concave and the other convex, state which one will diverge a parallel beam of light falling on it. Draw a ray diagram to show the principal focus of the lens. CBSE-2025
6	The linear magnification produced by a spherical mirror is + 3. Based on this statement answer the following questions:

	(a) What is the type of mirror? (b) Where is the object located? (c) List two properties of the image formed (other than the size/magnification). CBSE-2024
7	A light ray enters from medium A to medium B as shown in the figure  (a) Which one of the two media is denser w.r.t. other medium? Justify your answer (b) If the speed of light in medium A is u and in medium B is v, what is the refractive index of B with respect to A. CBSE-2023
3 MARKS QUESTIONS	
1	If we want to obtain a virtual and magnified image of an object using a concave mirror of focal length 18 cm, where should the object be placed? Use mirror formula to determine the object distance for an image of magnification -2 produced by this mirror and justify your answer. CBSE-2025
2	An object is placed in front of a concave mirror of focal length 12 cm. If distance of the object from the pole of the mirror is 8 cm, then use mirror formula to determine the position of the image formed. Draw a labelled ray diagram to justify your answer in this case. CBSE-2024
3	Draw ray diagrams to show the nature, position and relative size of the image formed by a convex mirror when the object is placed (i) at infinity and (ii) between infinity and pole P of the mirror. CBSE-2023
4	a) The image of an object formed by a lens is of same size but inverted. If the object distance is 30 cm, calculate (i) The distance between the object and its image. (ii) Focal length of the lens. (b) Draw a ray diagram to show the image formed in above case. CBSE-2023
5	Define the following terms in the context of a diverging mirror: (i) Principal focus (ii) Focal length Draw a labelled ray diagram to illustrate your answer. CBSE-2023
6	(a) Complete the following ray diagram to show the formation of image: 

	(b) Mention the nature, position and size of the image formed in this case. (c) State the sign of the image distance in this case using the Cartesian sign convention. CBSE-2023
7	A student has focused the image of an object of height 3 cm on a white screen using a concave mirror of focal length 12 cm. If the distance of the object from the mirror is 18 cm, find the values of the following: (i) Distance of the image from the mirror (ii) Height of the image CBSE-2023
8	Define power of a lens. The focal length of a lens is -10 cm. Write the nature of the lens and find its power. If an object is placed at a distance of 20 cm from the optical centre of this lens, according to the New Cartesian Sign Convention, what will be the sign of magnification in this case? CBSE-2023
5 MARKS QUESTIONS	
1	(i) “In refraction of light through a rectangular glass slab, the emergent ray is always parallel to the direction of the incident ray.” Why? Explain with the help of a ray diagram. What happens when a ray of light falls normally on one of the faces of a rectangular glass prism? Draw diagram. (ii) An object is placed at a distance of 30 cm from the optical centre of a concave lens of focal length 20 cm. Use Lens formula to determine the position of the image formed in this case. CBSE-2025
2	(i) Define principal axis of a lens. Draw a ray diagram to show what happens when a ray of light parallel to the principal axis of a concave lens passes through it. (ii) The focal length of a concave lens is 20 cm. At what distance from the lens should a 5 cm tall object be placed so that its image is formed at a distance of 15 cm from the lens? Also calculate the size of the image formed. CBSE-2024
3	(a) Upper half of a convex lens is covered with a black paper. Draw a ray diagram to show the formation of image of an object placed at a distance of 2F from such a lens. Mention the position and nature of the image formed. State the observable difference in the image obtained if the lens is uncovered. Give reason to justify your answer. (b) An object is placed at a distance of 30 cm from the optical centre of a concave lens of focal length 15 cm. Use lens formula to determine the distance of the image from the optical centre of the lens. CBSE-2024
4	(i) Draw a ray diagram to show the path of the refracted ray in each of the following cases: A ray of light incident on a concave lens (1) parallel to its principal axis, and (2) is directed towards its principal focus. ii) A 4 cm tall object is placed perpendicular to the principal axis of convex lens of focal length 24 cm. The distance of object from the lens is 16 cm. Find the position and size of image formed. CBSE-2024
5	(i) Draw a ray diagram to show the path of the reflected ray in each of the following cases: A ray of light incident on a convex mirror (1) parallel to its principal axis, and (2) is directed towards its principal focus. (ii) A 1.5 cm tall candle flame is placed perpendicular to the principal axis of a concave mirror of focal length 12 cm. If the distance of the flame from the pole of the mirror is 18 cm, use mirror formula to determine the position and size of the image formed. CBSE-2024

Class – 10 Visual Arts

- Draw **2–3 still life compositions** (bottle, fruits, cup, etc.)
- Focus on:
 - Light & shadow
 - Proportion
 - Neat pencil shading

Create **2 full-page compositions**:

- Nature (sunset, mountains, river)
- Human activity (market, village life, city scene)

Make **2 creative posters** with strong slogans:

- Save Environment
- Water Conservation
- Anti-Plastic
- Social Awareness (health, education, etc.)

Create **1 detailed artwork** in any style:

- Madhubani
- Warli
- Gond
- Pattachitra

- Make **2 design sheets**:
 - Mandala (radial symmetry)
 - Geometric / repeat patterns
- Use proper color harmony

Class 10 Music

- English:
- Select any one Raag:
 - Bhopali
 - Yaman

- Bhairav
- Learn one movie song based on the selected Raag.
- Write names of at least 5 songs based on each Raag in your notebook.
- Mention which song you liked the most.
- Prepare and perform that song.
- हिंदी:
- किसी एक राग का चयन करें:
- भोपाली
- यमन
- भैरव
- चुने हुए राग पर आधारित एक फिल्मी गीत सीखें।
- प्रत्येक राग पर आधारित कम से कम 5 गीतों के नाम नोटबुक में लिखें।
- जो गीत आपको सबसे अच्छा लगे उसका नाम लिखें।
- उस गीत की प्रस्तुति तैयार करें।
- Holiday Homework

- Subject: Artificial Intelligence (Part A – Employability Skills)
- Class: 10
- Unit 2: Self-Management Skills
- Do a thorough reading of unit 2 and complete the assignment.
- Q1. Answer the following questions
- 1.What do you mean by self-management?
- 2.Write any four qualities of a self-managed person.
- 3.What is self-confidence? Why is it important?
- 4.Define stress management.
- 5.Write any three ways to control stress.
- 6.What is time management?
- 7.Mention any four techniques of time management.
- 8.What is personal hygiene? Why is it necessary?
- 9.Explain the importance of positive thinking.
- 10.Differentiate between self-awareness and self-motivation.