Deeksha Vedantu™

SCIENCE QUESTION PAPER

2025

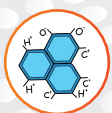## SCIENCE
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प्रश्न–पत्र कोड
Q.P. Code **31/1/1**

रोल नं.
Roll No.

- कृपया जाँच कर लें कि इस प्रश्न–पत्र में मुद्रित पृष्ठ **31** हैं ।
- प्रश्न–पत्र में दाहिने हाथ की ओर दिए गए प्रश्न–पत्र कोड को परीक्षार्थी उत्तर–पुस्तिका के मुख–पृष्ठ पर लिखें ।
- कृपया जाँच कर लें कि इस प्रश्न–पत्र में **39** प्रश्न हैं ।
- **कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर–पुस्तिका में प्रश्न का क्रमांक अवश्य लिखें ।**
- इस प्रश्न–पत्र को पढ़ने के लिए **15** मिनट का समय दिया गया है । प्रश्न–पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक परीक्षार्थी केवल प्रश्न–पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर–पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।

- Please check that this question paper contains **31** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **39** questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

विज्ञान
SCIENCE

निर्धारित समय : **3** घण्टे	अधिकतम अंक : **80**
Time allowed : **3** hours	Maximum Marks : **80**

P.T.O.

1

General Instructions :

*Read the following instructions carefully and strictly follow them :*

(i)   *This question paper consists of **39** questions. **All** questions are compulsory.*

(ii)   *Question paper is divided into **FIVE** sections viz. Section **A, B, C, D** and **E**.*

(iii)   *In Section **A** - question number **1** to **20** are Multiple Choice Questions (MCQs) carrying **1** mark each.*

(iv)   *In Section **B** - question number **21** to **26** are Very Short Answer (VSA) type questions carrying **2** marks each. Answer to these questions should be in the range of **30** to **50** words.*

(v)   *In Section **C** - question number **27** to **33** are Short Answer (SA) type questions carrying **3** marks each. Answer to these questions should be in the range of **50** to **80** words.*

(vi)   *In Section **D** - question number **34** to **36** are Long Answer (LA) type questions carrying **5** marks each. Answer to these questions should be in the range of **80** to **120** words.*

(vii)   *In Section **E** - question number **37** to **39** are of 3 source-based/case-based units of assessment carrying **4** marks each with sub-parts.*

(viii) *There is no overall choice. However, an internal choice has been provided in some Sections.*

2

SECTION – A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 20 :

1. In the experimental setup given below, it is observed that on passing the gas produced in the reaction in the solution 'X' the solution 'X' first turns milky and then colourless.   **1**


Dilute Hydrochloric Acid

Sodium carbonate

X
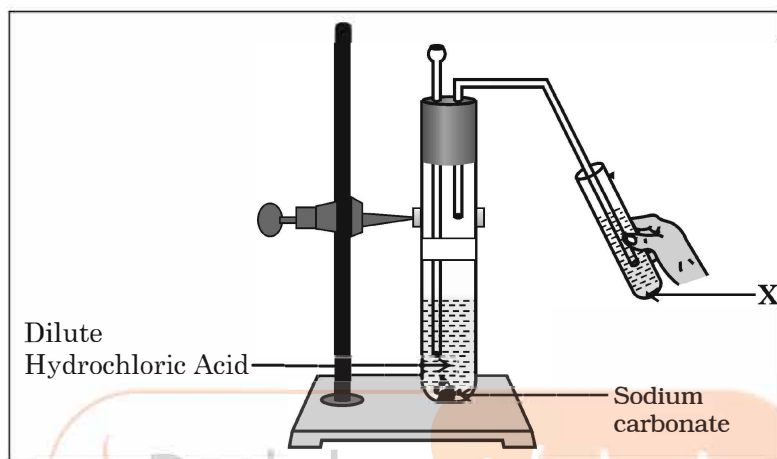
The option that justifies the above stated observation is that 'X' is aqueous calcium hydroxide and

(a) it turns milky due to carbon dioxide gas liberated in the reaction and after sometime it becomes colourless due to formation of calcium carbonate.

(b) it turns milky due to formation of calcium carbonate and on passing excess of carbon dioxide it becomes colourless due to formation of calcium hydrogen carbonate which is soluble in water.

(c) it turns milky due to passing of carbon dioxide through it. It turns colourless as on further passing carbon dioxide, sodium hydrogen carbonate is formed which is soluble in water.

(d) the carbon dioxide liberated during the reaction turns lime water milky due to formation of calcium hydrogen carbonate and after some time it turns colourless due to formation of calcium carbonate which is soluble in water.

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2. The emission of brown fumes in the given experimental set-up is due to   1
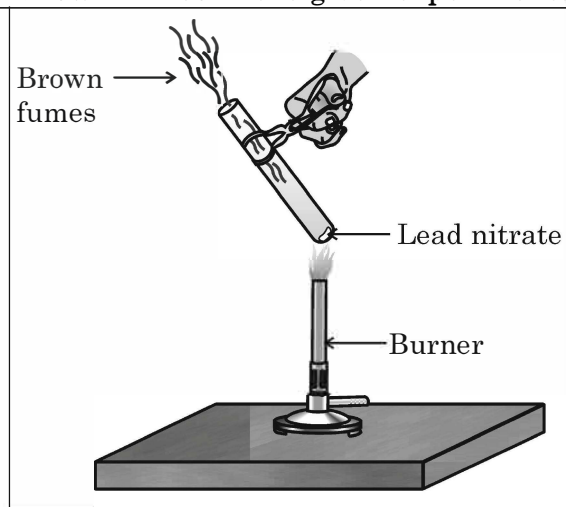
(a) thermal decomposition of lead nitrate which produces brown fumes of nitrogen dioxide.

(b) thermal decomposition of lead nitrate which produces brown fumes of lead oxide.

(c) oxidation of lead nitrate forming lead oxide and nitrogen dioxide.

(d) oxidation of lead nitrate forming lead oxide and oxygen.

3. $MnO_2 + x\, HCl \rightarrow MnCl_2 + y\, H_2O + z\, Cl_2$ 1

In order to balance the above chemical equation, the values of x, y and z respectively are :

(a) 6, 2, 2   (b) 4, 1, 2

(c) 4, 2, 1   (d) 2, 2, 1

4. The table below has information regarding pH and the nature (acidic/basic) of four different solutions. Which one of the options in the table is correct ?   1

| Option	Solution	Colour of pH paper	Approximate pH value	Nature of solution
(a)	Lemon juice	Orange	3	Basic
(b)	Milk of magnesia	Blue	10	Basic
(c)	Gastric juice	Red	6	Acidic
(d)	Pure water	Yellow	7	Neutral

5. A metal 'X' is used in thermite process. When X is burnt in air it gives an amphoteric oxide 'Y'. 'X' and 'Y' are respectively :   1

(a) Fe and Fe_2O_3 (b) Al and Al_2O_3

(c) Fe and Fe_3O_4 (d) Al and Al_3O_4

31/1/1   **P.T.O.**

6. Select washing soda from the following : 1

(a) $NaHCO_3$ (b) $Na_2CO_3.5H_2O$

(c) $Na_2CO_3.10H_2O$ (d) $NaOH$

7. Consider the structures of the three cyclic carbon compounds A, B and C given below and select the correct option from the following : 1
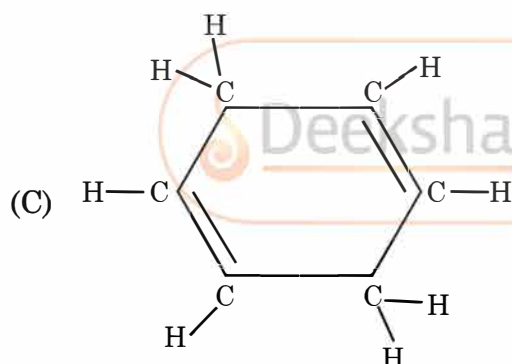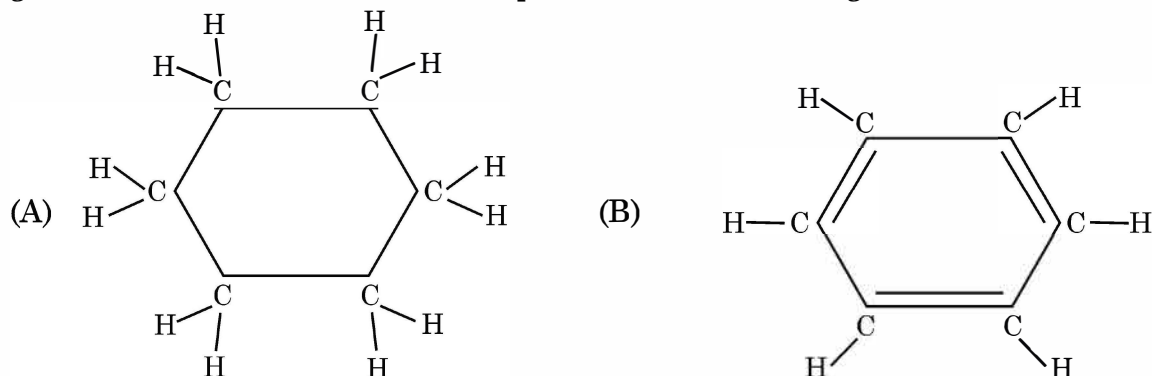
(a) A and C are isomers of hexane and B is benzene.

(b) A is an isomer of hexane, B is benzene and C is an isomer of hexene.

(c) A is a saturated cyclic hydrocarbon and B and C are unsaturated cyclic hydrocarbons.

(d) A is cyclohexane and B and C are the isomers of benzene.

8. An organism which breaks down the food material outside the body and then absorbs it is 1

(a) a plant parasite, Cuscuta (b) an animal parasite, Tapeworm

(c) a bacteria, Rhizobium (d) a fungi, Rhizopus

31/1/1 **P.T.O.**

5

9. Consider the following statements about small intestine and select the one which is <u>NOT</u> correct :   **1**

   (a) The length of the small intestine in animals differs as it depends on the type of food they eat.

   (b) The small intestine is the site of complete digestion of food.

   (c) The small intestine receives secretions from liver and pancreas.

   (d) The villi of the small intestine absorb water from the unabsorbed food before it gets removed from the body via the anus.

10. The statement that correctly describes the characteristic(s) of a gene is :   **1**

    (a) In individuals of a given species, a specific gene is located on a particular chromosome.

    (b) A gene is not the information source for making proteins in the cell.

    (c) Each chromosome has only one gene located all along its length.

    (d) All the inherited traits in human beings are not controlled by genes.

11. Select from the following the correct statement about tropic movement in plants :   **1**

    (a) It is due to stimulus of touch and temperature.

    (b) It does not depend upon the direction of stimulus received.

    (c) It is observed only in roots and not in stems.

    (d) It is a growth related movement.

12. Select the INCORRECT match (between the plant and its vegetative part) from the following :   **1**

    (a) Bryophyllum, leaf   (b) Potato, stem

    (c) Money-plant, stem   (d) Rose, root

31/1/1   **P.T.O.**

13. If four identical resistors, of resistance 8 ohm, are first connected in series so as to give an effective resistance R_s, and then connected in parallel so as to give an effective resistance R_p, then the ratio $\dfrac{R_s}{R_p}$ is   1

   (a) 32   (b) 2

   (c) 0.5   (d) 16

14. In domestic electric circuits the wiring with 15 A current rating is for the electric devices which have   1
   (a) higher power ratings such as geyser.
   (b) lower power ratings such as fan.
   (c) metallic bodies and low power ratings.
   (d) non-metallic bodies and low power ratings.

15. In the following diagram, the position of the needle is shown on the scale of a voltmeter. The least count of the voltmeter and the reading shown by it respectively are :   1
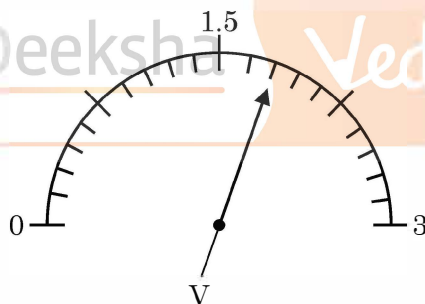
   (a) 0.15 V and 1.6 V   (b) 0.05 V and 1.6 V
   (c) 0.15 V and 1.8 V   (d) 0.05 V and 1.8 V

16. The resultant magnetic field at point 'P' situated midway between two parallel wires (placed horizontally) each carrying a steady current I is   1

   (a) in the same direction as the current in the wires.
   (b) in the vertically upward direction.
   (c) zero
   (d) in the vertically downward direction.

31/1/1   **P.T.O.**

Q. Nos. 17 to 20 are Assertion – Reason based questions.

These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below :

(a)   Both (A) and (R) are true and (R) is the correct explanation of (A).

(b)   Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(c)   (A) is true, but (R) is false.

(d)   (A) is false, but (R) is true.

17.   **Assertion (A) :** The colour of aqueous solution of copper sulphate turns colourless when a piece of lead is added to it.   **1**

    Reason (R) : Lead is more reactive than copper, and hence displaces copper from its salt solution.

18.   **Assertion (A) :** Genes inherited from the parents decide the sex of a child.   **1**

    Reason (R) : X chromosome in a male child is inherited from his father.

19.   **Assertion (A) :** Blood clotting prevents excessive loss of blood.   **1**

    Reason (R) : Blood clotting is due to blood plasma and white blood cells present in the blood.

20.   **Assertion (A) :** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns in it.   **1**

    Reason (R) : The current in each circular turn has the same direction and the magnetic field due to each turn then just adds up.

31/1/1   **P.T.O.**

SECTION – B

Q. No. 21 to 26 are very short answer questions.

21. (a) (i) A compound 'X' which is prepared from gypsum has the property of hardening when mixed with proper quantity of water.   **2**

Identify 'X' and write its chemical formula.

(ii) State the difference in chemical composition between baking soda and baking powder.

OR

(b) Write balanced chemical equation for the reaction that occurs when :   **2**

(i) blue coloured copper sulphate crystals are heated and

(ii) Sodium hydrogen carbonate is heated during cooking.

22. (a) Write the role of insulin in regulating blood sugar levels in human body. Mention the disease caused due to it.   **2**

(b) How is the timing and the amount of release of insulin in the blood regulated ?

23. (a) Name the type of blood (oxygenated / deoxygenated) transported by each of the following mentioning the path (i.e. from one organ (which place) to another (which place)).   **2**

(i) Vena cava

(ii) Pulmonary artery

OR

(b) With the help of a schematic flow chart, show the breakdown of glucose in a cell to provide energy –   **2**

(i) in the presence of oxygen

(ii) in lack of oxygen

31/1/1   **P.T.O.**

24. Name the part of the human excretory system where nephrons are found. Write the structure and function of nephrons. **2**

25. (a) A narrow beam XY of white light is passing through a glass prism ABC as shown in the diagram : **2**
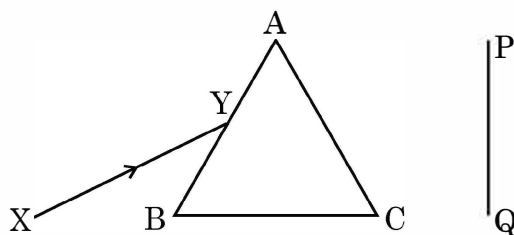
Trace it on your answer sheet and show the path of the emergent beam as observed on the screen PQ.

Name the phenomenon observed and state its cause.

OR

(b) It is observed that the power of an eye to see nearby objects as well as far off objects diminishes with age. **2**

(i) Give reason for the above statement.

(ii) Name the defect that is likely to arise in the eyes in such a condition.

(iii) Draw a labelled ray diagram to show the type of corrective lens used for restoring the vision of such an eye.

26. How do harmful chemicals get accumulated progressively at each trophic level in a food chain ? **2**

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SECTION – C

Q. No. 27 to 33 are short answer questions.

27. (a) Identify the reducing agent in the following reactions :   **3**

    (i) $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$

    (ii) $H_2O + F_2 \rightarrow HF + HOF$

    (iii) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

    (iv) $2H_2 + O_2 \rightarrow 2H_2O$

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

28. (a) Suggest one remedial measure each to counteract the change in pH in human beings in following cases :   **3**

    (i)   Production of too much acid in stomach during indigestion

    (ii) Stung by a honey bee / nettle leaves

   (b) Fresh milk has a pH of 6. When it changes into curd will its pH increase or decrease ? Why ?

29. (a) (i)   State the role of ATP in cellular respiration.   **3**

    (ii)   What ensures sufficient exchange of gases in plants ?

    (iii) State the conditions on which the direction of diffusion of gases in plant depend upon.

<div align="center">OR</div>

   (b) (i)   What is the internal energy reserve in plants and animals ?

    (ii)   How desert plants perform photosynthesis if their stomata remain closed during the day ?   **3**

30. (a) Complete the following ray diagram to show the formation of image :   **3**
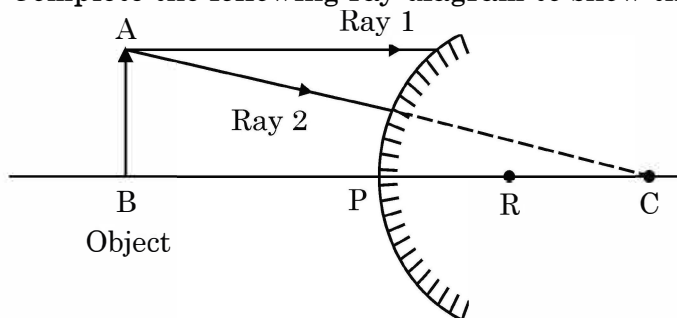
   (b) Mention the nature, position and size of the image formed in this case.

   (c) State the sign of the image distance in this case using the Cartesian sign convention.

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31. Give reasons for the following :　　　　　　　　　　　　　　　　**3**
    (a) Danger signals installed at airports and at the top of tall buildings are of red colour.
    (b) The sky appears dark to the passengers flying at very high altitudes.
    (c) The path of a beam of light passing through a colloidal solution is visible.

32. (a) (i) State the rule used to find the force acting on a current carrying conductor placed in a magnetic field.　　　　　　**3**
       (ii) Given below are three diagrams showing entry of an electron in a magnetic field. Identify the case in which the force will be (1) maximum and (2) minimum respectively. Give reason for your answer.

(i)　　　　　　　　(ii)　　　　　　　　(iii)

OR
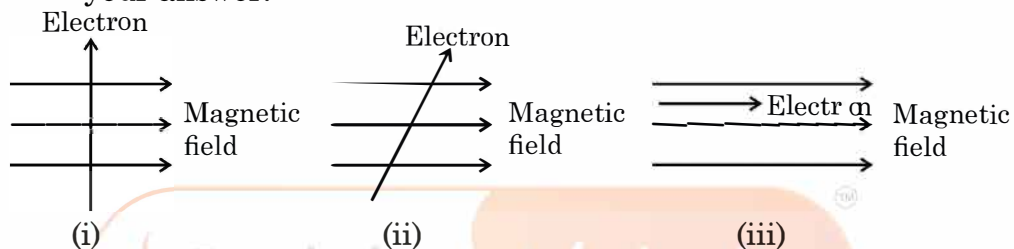
    (b) (i) Draw the pattern of magnetic field lines of　　　　　　**3**
       (1)　a current carrying solenoid
       (2)　a bar magnet
       (ii) List two distinguishing features between the two fields.

33. (a) (i) Why does a kitchen garden called an artificial ecosystem while a forest is considered to be a natural ecosystem ?　　**3**
       (ii) While designing an artificial ecosystem at home, write any two things to be kept in mind to convert it into a self-sustaining system. Give reason to justify your answer.

OR

    (b) (i) Construct a food chain of four trophic levels comprising the following :　　　　　　　　　　　　　　　　　　**3**
       Hawk, snake, plants, rat.
       (ii) 20,000 J of energy was transferred by the producers to the organism of second trophic level. Calculate the amount of energy that will be transferred by organisms of the third trophic level to the organisms of the fourth trophic level.

31/1/1　　　　　　　　　　　　　　　　　　　　　　　**P.T.O.**

SECTION – D

Q. No. 34 to 36 are long answer questions.

34. (a) A saturated organic compound 'A' belongs to the homologous series of alcohols. **5**

On heating 'A' with concentrated sulphuric acid at 443 K, it forms an unsaturated compound 'B' with molecular mass 28 u.

The compound 'B' on addition of one mole of hydrogen in the presence of Nickel, changes to a saturated hydrocarbon 'C'.

(i) Identify A, B and C.

(ii) Write the chemical equations showing the conversion of A into B.

(iii) What happens when compound C undergoes combustion ?

(iv) State one industrial application of hydrogenation reaction.

(v) Name the products formed when compound A reacts with sodium.

OR

(b) (i) With the help of diagram, show the formation of micelles, when soap is applied on oily dirt. **5**

(ii) Take two test tubes X and Y with 10 mL of hard water in each.

In test tube 'X', add few drops of soap solution and in test tube 'Y' add a few drops of detergent solution. Shake both the test tubes for the same period.

(1) In which test tube the formation of foam will be more ? Why ?

(2) In which test tube is a curdy solid formed ? Why ?

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35. (a) Name the parts of a bisexual flower that are not directly involved in reproduction. **5**

(b) Differentiate between self pollination and cross pollination. List any two significance of pollination.

(c) What is the fate of ovules and ovary after fertilization in a flower ?

36. (a) An electric iron consumes energy at a rate of 880 W when heating is at the maximum rate and 330 W when the heating is at the minimum. If the source voltage is 220 V, calculate the current and resistance in each case. **5**

(b) What is heating effect of electric current ?

(c) Find an expression for the amount of heat produced when a current passes through a resistor for some time.

SECTION – E

Q. No. 37 to 39 are case based/data based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. Almost all metals combine with oxygen to form metal oxides. Metal oxides are generally basic in nature. But some metal oxides show both basic as well as acidic behaviour. Different metals show different reactivities towards oxygen. Some react vigorously while some do not react at all.

(a) What happens when copper is heated in air ? (Give the equation of the reaction involved). **1**

(b) Why are some metal oxides categorized as amphoteric ? Give one example. **1**

(c) Complete the following equations : **2**

(i) $Na_2O_{(s)} + H_2O_{(l)} \rightarrow$

(ii) $Al_2O_3 + 2\ NaOH \rightarrow$

**OR**

(c) On burning Sulphur in oxygen a colourless gas is produced.   **2**

    (i) Write chemical equation for the reaction.

    (ii) Name the gas formed.

    (iii) State the nature of the gas.

    (iv) What will be the action of this on a dry litmus paper ?

38. In order to trace the inheritance of traits Mendel crossed pea plants having one contrasting character or a pair of contrasting characters. When he crossed pea plants having round and yellow seeds with pea plants having wrinkled and green seeds, he observed that no plants with wrinkled and green seeds were obtained in the F_1 generation. When the F_1 generation pea plants were cross-bred by self-pollination, the F_2 generation had seeds with different combinations of shape and colour also.

(a) Write any two pairs of contrasting characteristics of pea plant used by Mendel other than those mentioned above.   **1**

(b) Differentiate between dominant and recessive traits.   **1**

(c) State the ratio of the combinations observed in the seeds of F_2 generation (in the above case). What do you interpret from this result ?   **2**

<div align="center">OR</div>

(c) Given below is a cross between a pure violet flowered pea plant (V) and a pure white flowered pea plant (v). Diagrammatically explain what type of progeny is obtained in F_1 generation and F_2 generation :

Pure violet flowered plant × Pure white flowered plant.   **2**
    (V V)   (v v)

31/1/1   **P.T.O.**

39. Hold a concave mirror in your hand and direct its reflecting surface towards the sun. Direct the light reflected by the mirror on to a white card-board held close to the mirror. Move the card-board back and forth gradually until you find a bright, sharp spot of light on the board. This spot of light is the image of the sun on the sheet of paper; which is also termed as "Principal Focus" of the concave mirror.
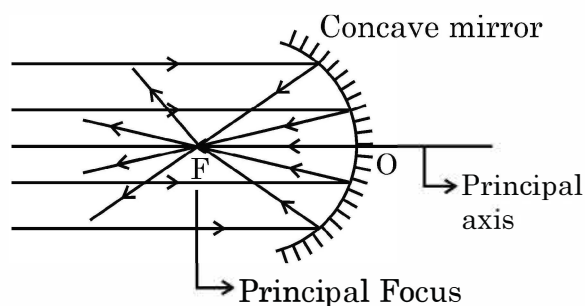
(a) List two applications of concave mirror. **1**

(b) If the distance between the mirror and the principal focus is 15 cm, find the radius of curvature of the mirror. **1**

(c) Draw a ray diagram to show the type of image formed when an object is placed between pole and focus of a concave mirror. **2**

OR

(c) An object 10 cm in size is placed at 100 cm in front of a concave mirror. If its image is formed at the same point where the object is located, find : **2**

(i) focal length of the mirror, and

(ii) magnification of the image formed with sign as per Cartesian sign convention.

―――――

31/1/1

16

"Deeksha's balanced approach to PU and JEE prep, with weekly assessments and dedicated hours, refined my strategy. Supportive teachers and a great learning environment made all the difference."

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