Time: 2 hours

1. All questions are compulsory.

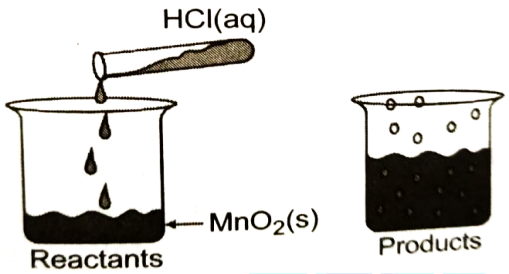
2. The question paper consists of 47 questions, divided into five sections: A, B, C, D and E.

3. (i) Section A comprises 30 questions of 1 mark each.
(ii) Section B comprises 7 questions of 2 marks each.
(iii) Section C comprises 6 questions of 3 marks each.
(iv) Section D comprises 2 case studies of 4 marks each.
(v) Section E comprises 2 questions of 5 marks each.

SECTION-A (1 Mark each)

I. Multiple Choice Questions:

1.The chemical reaction between Mno2 and HCL is an example of:



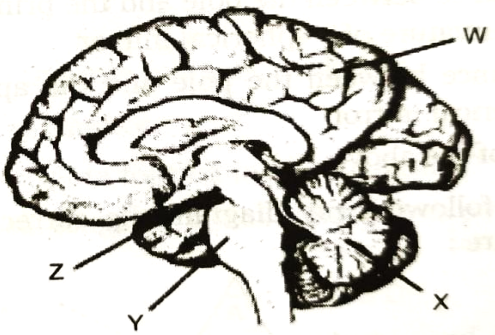
(a) Displacement reaction (b) Combination reaction
(c) Redox reaction (d) Decomposition reaction

2. When a few drops of iodine solution are added to rice water, the solution turns blue-black in colour. This indicates that rice water contains:
(a)Fats (b)Complex proteins
(c)Starch (d) Simple proteins

3. The basic nature of a solution increases as we move from:
(a)pH 7 to14 on a pH scale
(b)pH 14 to 7 on a pH scale
(c)pH 0 to 7 on a pH scale
(d)pH 7 to 0 on a pH scale

4. Which of the following does not belong to the same homologous series?
(a) CH4 (b) C2H6
(c) C3H8 (d) C4H8

The diagram shows a section of the brain and different parts labelled as W,X,Y And Z.



Study the figure and correlate the regions which control balance, heart rate and temperature in the human body.

	Balance	Heart Rate	Temperature
(a)	W	Z	X
(b)	X	Y	Z
(c)	Y	X	W
(d)	Z	W	Y

6. What will be the number of chromosomes present in each gamete produced by the plants if the palisade cells of a species of plants contain 28 chromosomes in all?
(a) 56 (b) 28
(c) 14 (d) 4

7. A *Planaria* worm is cut horizontally in the middle into two halves A and B such that the part A contains the whole head of the worm. Another *Planaria* worm is cut vertically into two halves C and D in such a way that both the cut pieces C and

D contain half head each. Which of the cut pieces of the complete respective worms?

(a) Only A (b) C and D
(c) A,C and D (d) A,B,C and D

8. Two pea plants one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds produce f1 progeny that have round, yellow (RrYy) seeds.When F1 plants are selfed, the f2 progeny will have new combination from the following:

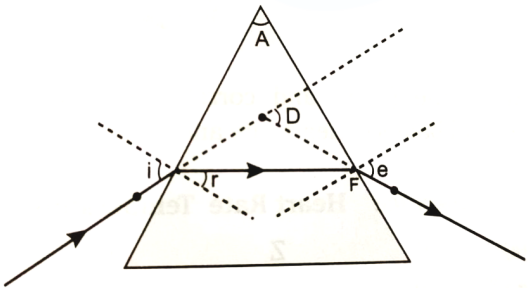
(i) Round,yellow
(ii) Round, green
(iii) Wrinkled, yellow
(iv) Wrinkled, green

(a) (ii) and (iii) (b) (i) and (iv)
(c) (i) and (ii) (d) (i) and (iii)

9. The focal length '*f*' of the spherical mirror is the:

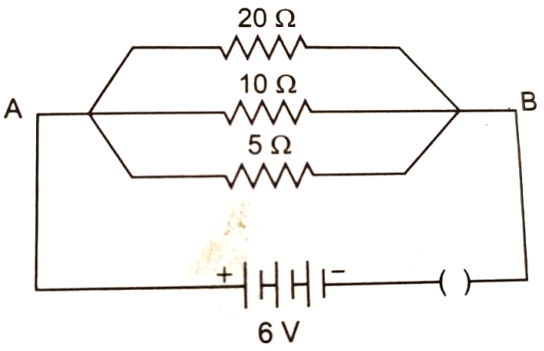
(a) distance between the pole and the principal focus of the spherical mirror
(b) distance between the pole and the principal centre of the curvature of a spherical mirror
(c) distance between the pole and the aperture of a spherical mirror mirror
(d) All of the above

10. In the following ray diagram the correctly marked angle are:



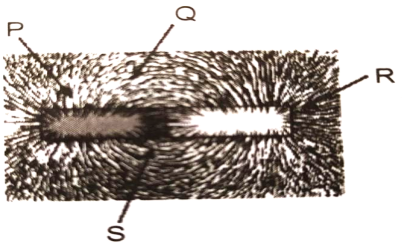
(a) ∠i and ∠e (b) ∠A and ∠D
(c) ∠i, ∠e and ∠D (d) ∠r, ∠A and ∠D

11. Calculate the current flows through the 10 Ω resistor in the following circuit.



(a) 1.2 A (b) 0.6 A
(c) 0.2 A (d) 2.0 A

12. A student places some iron filings around a magnet.The iron filings arrange themselves as shown in the image.



The student labelled four different regions around the magnet.Where would the magnetic field be the strongest?

(a) P (b) Q
(c) R (d) S

13. Which of the following is the terrestrial ecosystem?

(a) Natural forest (b) Natural pond
(c) Natural lake (d) Man-made aquarium

14. A cross between two individuals results in a ratio of 9:3:3:1 for four possible phenotypes of progeny. This is an example of a:

(a) Monohybrid cross (b) Dihybrid cross
(c) Test cross (d) F1 generation

15. In *Amoeba,* mode of uptake of food through the:

(a) Pseudopodia (b) Food vacuole
(c) Chloroplast (d) All of the above

II. Assertion Reason Type Questions:

Read the assertion and reason statements carefully and mark the correct option out of the following options:

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but the reason is not the correct explanation of the assertion.

(c) If the assertion is true but the reason is false.

(d) If both assertion and reason are false.

16. Assertion: carbon dioxide is mostly transported in the dissolved form in our blood.

Reason: It is more Soluble in water than oxygen.

17.Assertion: Two members of a homologous series have similar chemical properties.

Reason: Propane and butane are members of the same homologous series.

18.Assertion: The focal length of a concave mirror is independent of the medium in which it is placed.

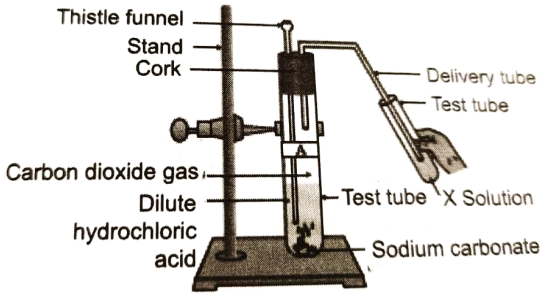
Reason: When a cove mirror is held under water, its focal length will increase.

19.Assertion: Terrestrial animals can breathe the oxygen in the atmosphere.

Reason: Animals that live in water use the oxygen dissolved in water.

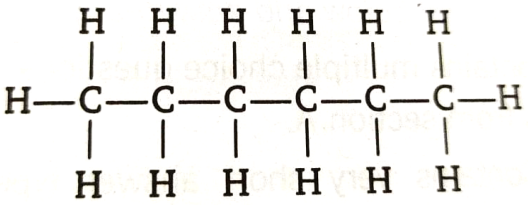
III. Diagram Based Questions:

20. In the given experiment set up, the evolved gas carbon dioxide is passed through a solution "X", as a result the solution turns milky. The solution is:



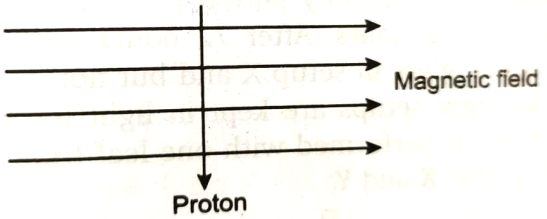
(a) CaO (b) Ca(OH)2
(c) CaCO3 (d) Cacl2

21. The given compound is:

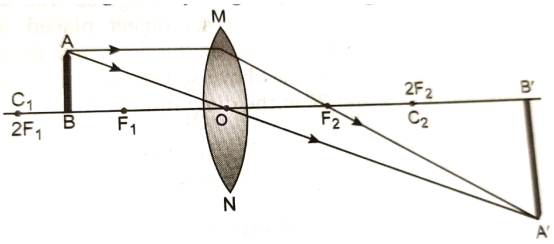


(a) Pentane (b) Hexane
(c) Heptane (d) Hexene

22. What is the direction of the force acting on the proton?



23. In the given ray diagram, the image formed is:



(a) Upright, small, real
(b) Inverted, real, larger in size
(c) Upright, virtual, small
(d) Inverted, virtual, larger in size

24. Illustrate any one the following with the help of suitable diagram:

(i) Binary fission in *Amoeba.*

(ii) Vegitative propagation in *Bryophyllum*.

IV. Very short Questions:

25. What is the role of auxin in plants?

26. Define resistance?

27. How is zygote formed in the human body?

28. The focal length of a lens is 50cm. Its power will be:

(a)5 D (b) 4 D
(c)3 D (d) 2 D

29. Name the intermediate and the end product of the glucose, breakdown in aerobic respiration.

30. Write the name and structure of an aldehyde with carbon atoms in its molecule.

SECTION - B (2 Mark each)

31. What is an alloy? State the constituents of solder. Which property of solder makes it suitable for welding electrical wires?

32. What Is a Neutralisation reaction? Give some examples.

33. Name the products formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change?

34. What would be the electron dot structure of carbon dioxide which has the formula CO_2?

35. State the basic difference between the process of respiration and photosynthesis.

36. Define focal length of a divergent lens.

37. Give two uses of magnetic compass.

SECTION - C (3 Marks each)

38. Write Balanced chemical equations for the following reactions:

(i) Dilute sulphuric acid reacts with aluminium powder.

(ii)Dilute hydrochloric acid reacts with sodium carbonate.

(iii) Carbon dioxide is passed through lime water.

39. What are the different isomers of bromopentane?

40. State three differences between arteries and veins.

41.(i) State one advantage of variation to a species.

(ii) What are sex chromosomes? How many sex chromosomes are there? Name them.

42.A lens can form a magnified erect image as well as magnified inverted image of an object placed in front of it. State the nature of this lens and draw ray diagrams to justify the above statement. Mark the position of O,F and 2F in the diagram.

43. What is the importance of decomposers in an ecosystem?

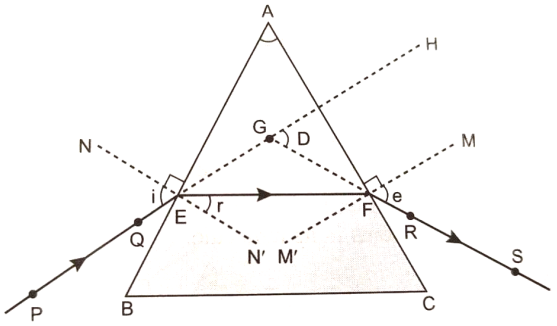
SECTION - D (4 Marks each)

Read the case given below and answer any four questions;

Section A:contains multiple choice questions.Answer any two questions from section A.

Section B:contains very short answer type questions.Answer any two questions in your own words for section B.

44. A glass prism has two triangular bases and three rectangular lateral surfaces.These surfaces are inclined to each other. The two lateral surfaces from an angle between them. In the given prism, a ray of light is entering from air to glass at the first surface AB. At the second surface AC, the light ray has entered from glass to air. The peculiar shape of the prism makes the emergent ray bend at an angle to the direction of the incident ray.



Section A:(Answer any two)

I. The angle between the refracting surfaces of prism is called:

(a) Angle of deviation (b) Angle of incidence

(c) Angle of refraction (d) Angle of prism

II. The angle of incidence is shown by:

(a) ∠NEA (b) ∠PEN

(c) ∠PEA (d) ∠NEF

III. The angle of deviation depends upon:

(a) Refractive index of prism

(b) Angle of incidence

(c) Both

(d) None

IV. The peculiar shape of the prism makes the emergent ray bend at an angle to the direction of the incident ray. This is called:

(a) Angle of deviation (b) Angle of incidence

(c) Angle of prism (d) Angle of depreciation

Section B:(Answer any two)

I. Define angle of incidence and angle of deviation.

II. What is ∠D in the given case?

III. The angle of emergence is represented by….. .

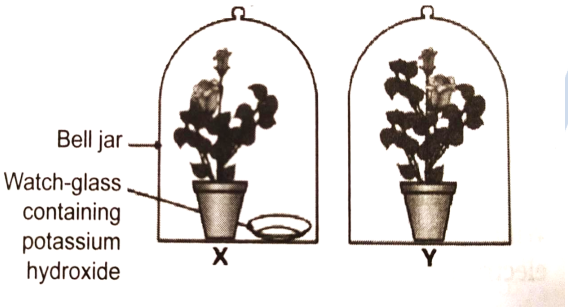
IV. The line FS is called …….. Ray .

Read the case given below and answer any four questions;

Section A:contains multiple choice questions.Answer any two questions from section A.

Section B:contains very short answer type questions.Answer any two questions in your own words for section B.

45. The figure shown below represents an experiment to prove the requirements for photosynthesis. In this experiment,two healthy potted plants were kept in the dark for 72 hours. After 72 hours, KOH is kept in the watch glass in setup X and but not in setup Y. These air tight setups are kept in the light for 6 hours. Then, a test is performed with one leaf from each of the two plants X and Y.



Section A:(Answer any two)

I. The appropriate test for this experimental set-up is:
(a) Potassium hydroxide test
(b) Sodium bicarbonate test
(c) Iodine test
(d) Chlorine test

II. If KOH was not put in the jar, it will not prove the requirement of……. For photosynthesis:
(a) Carbon dioxide (b) Chlorophyll
(c) Water (d) Sunlight

III. KOH in the given experiment function as:
(a) Absorption of carbon dioxide
(b)Conversion of carbon dioxide to release oxygen
(c) Conversion of starch to sugar to give the test result
(d) absorption of carbon dioxide and other harmful gases.

IV. The test performed after the experiment shows the change in colour of leaves from:
(a) Blue to grey (b) Black to grey
(c) Green to yellow (d) White to bluish black

Section B:(Answer any two)

I. Do both the leaves show the presence of the same amount of starch in the given experiment?

II. What can you conclude from this activity?

III. What is the function of KOH in the given experiment?

IV. The test was performed at the end of the experiment to show the presence of …….. .

SECTION - E (5 Marks each)

46. What are the plant hormones? Give one example each of the plant hormone that:
(i) promotes growth.
(ii) inhibits growth.
(iii) promotes cell division.
(iv) promotes the growth of a tendril around a support.

47.(i) Define a balanced chemical equation. Why should an equation be balanced?
(ii) Write the balanced chemical equation for the following reaction:
(a) Phosphorus burns in presence of chlorine to form phosphorus pentachloride
(b) Burning of natural gas
(c) The process of respiration