

# CBSE Class 10 Science Sample Paper

**Time Duartions:3Hrs**

**Maximum Marks:90**

## General Instructions:

1. The question paper comprises of two Sections, A and B. You are to attempt both the section
2. All questions are compulsory.
3. All questions of section A and All questions of section B are to be attempted separately.
4. Question numbers 1 to 3 in Section-A are one mark questions. These are to be answered in one word or in one sentence.
5. Question numbers 4 to 6 in Section-A are two marks questions. These are to be answered in about, 30 words each.
6. Question numbers 7 to 18 in Section-A are three marks questions. These are to be Answered in about 50 words each.
7. Question numbers 19 to 24 in Section-A are five marks questions. These are to be answered in about 70 words each.
8. Question numbers 25 to 33 in Section-B are multiple choice questions based on practical skills, each question is a one mark question. You are to select one most appropriate response out of the four provided to you.
9. Question numbers 34 to 36 in Section-B are questions based on practical skills. Each question carries two marks.

## SECTION-A

1. List any two properties of the elements belonging to the first group of the modern periodic table. 1
2. What is a gene ? 1
3. Give one example each from your daily life where the domestic waste can be effectively reused and recycled. 1
4. What is the main difference between sperms and eggs of humans ? Write the importance of this difference. 2
5. List two possible ways in which a concave mirror can produce a magnified image of an object placed in front of it. State the difference, if any, between these two images. 2
6. What are decomposers ? List two important roles they play in the environment. 2
7. Why is sustainable management of natural resources necessary ? Out of the two methods - reuse and recycle - which one would you suggest to practise and why ? 2
8. What are homologous series of carbon compounds ? Write the molecular formula of two consecutive members of homologous series of aldehydes. State which part of these compounds determines their'
  - (i) Physical and
  - (ii) Chemical properties. 3

9. A carboxylic acid (molecular formula  $C_2H_4O_2$ ) reacts with an alcohol in the presence of an acid catalyst to form a compound 'X'. The alcohol on oxidation with alkaline  $KMnO_4$  followed by acidification gives the same carboxylic acid  $C_2H_4O_2$ . Write the name and structure of (i) carboxylic acid, (ii) alcohol and (iii) the compound 'X'. 3

10. The electrons in the atoms of four elements A, B, C and D are distributed in three shells having 1, 3, 5 and 7 electrons in the outermost shell respectively. State the period in which these elements can be placed in the modern periodic table. Write the electronic configuration of the atoms of A and D and the molecular formula of the compound formed when A and D combine. 3

11. Study the following table in which positions of six elements A, B, C, D, E and F are shown as they are in the modern periodic table :

Group Period ↓	1	2	3 – 12	13	14	15	16	17	18
2	A					B			C
3				D	E				F

On the basis of the above table, answer the following questions :

- Name the element which forms only covalent compounds.
- Name the element which is a metal with valency three.
- Name the element which is a non-metal with valency three.
- Out of D and E, which is bigger in size and why ?
- Write the common name for the family to which the elements C and F belong.

12. Explain the process of regeneration in Planaria. How is this process different from reproduction ? 3

13. What is placenta ? State its function in human female. 3

14. With the help of suitable examples, explain why certain traits cannot be passed on to the next generation. What are such traits called ? 3

15. "A trait may be inherited, but may not be expressed". Justify this statement with the help of a suitable example. 3

16. A student wants to project the image of a candle flame on a screen 60 cm in front of a mirror by keeping the flame at a distance of 15 cm from its pole. 3

- Write the type of mirror he should use.
- Find the linear magnification of the image produced.
- What is the distance between the object and its image ?
- Draw a ray diagram to show the image formation in this case.

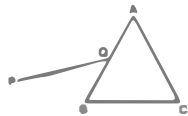
17. Draw a ray diagram to show the path of the refracted ray in each of the following cases ;3

A ray of light incident on a concave lens is

- passing through its optical centre.
- parallel to its principal axis.

(iii) directed towards its principal focus.

18. A narrow beam PQ of white light is passing through a glass prism ABC as shown in the diagram. 3



Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.

(i) Write the name and cause of the phenomenon observed.

(ii) Where else in nature is this phenomenon observed ?

(iii) Based on this observation, state the conclusion which can be drawn about the constituents of white light.

19. "Energy flow in a food chain is unidirectional." Justify this statement. Explain how the pesticides enter a food chain and subsequently get into our body. 3

20. Elements forming ionic compounds attain noble gas configuration by either gaining or losing electrons from their outermost shells. Give reason to explain why carbon cannot attain noble gas configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compounds formed by carbon. Also give reason why carbon compounds are generally poor conductors of electricity. 5

21. (a) Draw a sectional view of human female reproductive system and label the part where

(i) eggs develop.

(ii) fertilisation take place.

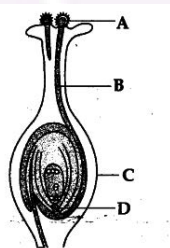
(iii) fertilised egg gets implanted.

(b) Describe, in brief, the changes the uterus undergoes

(i) to receive the zygote.

(ii) if zygote is not formed. 5

22. (a) Name the parts labelled as A, B, C and D in the diagram given below :



(b) What is pollination ? State its significance.

(c) How does fertilisation occur in flowers ? Name the parts of the flower that develop into (i) Seed, and (ii) fruit after fertilisation. 5

23. (a) Explain the following terms related to spherical lenses :

(i) optical centre

(ii) centres of curvature

(iii) principal axis

(iv) aperture

(v) principal focus

(vi) focal length

(b) A converging lens has focal length of 12 cm. Calculate at what distance should the object be placed from the lens so that it forms an image at 48 cm on the other side of the lens. 5

24. (a) List the parts of the human eye that control the amount of light entering into it. Explain how they perform this function.

(b) Write the function of retina in human eye.

(c) Do you know that the corneal-impairment can be cured by replacing the defective cornea with the cornea of the donated eye ? How and why should we organise groups to motivate the community members to donate their eyes after death ? 3

## SECTION-B

25. In an experiment to study the properties of ethanoic acid, a student takes about 3 mL of ethanoic acid in a dry test tube. He adds an equal amount of distilled water to it and shakes the test tube well. After some time he is likely to observe that 1 Mark

(A) a colloid is formed in the test tube.

(B) the ethanoic acid dissolves readily in water.

(C) the solution becomes light orange.

(D) water floats over the surface of ethanoic acid.

26. A student takes about 2 mL ethanoic acid in a dry test tube and adds a pinch of sodium hydrogen carbonate to it. He reports the following observations : 1 Mark

I. Immediately a colourless and odourless gas evolves with a brisk effervescence.

II. The gas turns lime water milky when passed through it.

III. The gas burns with an explosion when a burning splinter is brought near it.

IV. The gas extinguishes the burning splinter that is brought near it.

The correct observations are

(A) I, II and III (B) II, III and IV

(C) III, IV and I (D) I, II and IV

27. We need 20% aqueous solution of sodium hydroxide for the study of saponification reaction. When we open the lid of the bottle containing solid sodium hydroxide we observe it in which form ? 1 Mark

(A) Colourless transparent beads (B) Small white beads

(C) White pellets/flakes (D) Fine white power

28. While studying saponification reaction, a student measures the temperature of the reaction mixture and also finds its nature using blue/red litmus paper. On the basis of his observations the correct conclusion would be 1

- (A) the reaction is exothermic and the reaction mixture is acidic.
- (B) the reaction is endothermic and the reaction mixture is acidic.
- (C) the reaction is endothermic and the reaction mixture is basic.
- (D) the reaction is exothermic and the reaction mixture is basic.

29. In a locality, hard water, required for an experiment, is not available. However, the following salts are available in the school laboratory : 1

1. Sodium sulphate
2. Calcium sulphate
3. Magnesium chloride
4. Sodium chloride
5. Calcium chloride
6. Potassium sulphate

Which of the above salts may be dissolved in water to obtain hard water for the experiment ?

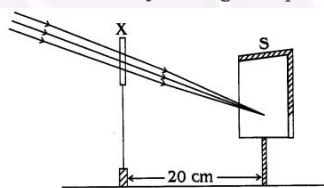
- (A) 2, 3 and 5 (B) 1, 2 and 5
- (C) 1, 2, 4 and 6 (D) 3 and 5 only

30. A student has obtained an image of a well-illuminated distant object on a screen to determine the focal length,  $F_1$  of the given spherical mirror. The teacher then gave him another mirror of focal length,  $F_2$  and asked him to obtain a focussed image of the same object on the same screen. The student found that in order to focus the same object using the second mirror, he has to move the mirror away from the screen. From this observation it may be concluded that both the spherical mirrors given to the student were (select the correct option)

- (A) Concave and  $F_1 < F_2$  (B) Concave and  $F_1 > F_2$
- (C) Convex and  $F_2 < F_1$  (D) Convex and  $F_1 > F_2$

31. A student focussed the Sun rays using an optical device 'X' on a screen S as shown.

1 Mark



From this it may be concluded that the device 'X' is a (select the correct option)

- (A) Convex lens of focal length 10 cm.
- (B) Convex lens of radius of curvature 20 cm.
- (C) Convex lens of focal length 20 cm.
- (D) Concave mirror of focal length 20 cm.

32. After tracing the path of a ray of light passing through a rectangular glass slab for four different values of the angle of incidence, a student reported his observations in tabular form as given below :

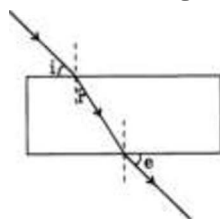
1 Mark

S. No.	$\angle i$	$\angle r$	$\angle e$
I	$30^\circ$	$19^\circ$	$29^\circ$
II	$40^\circ$	$28^\circ$	$40^\circ$
III	$50^\circ$	$36^\circ$	$50^\circ$
IV	$60^\circ$	$40^\circ$	$59^\circ$

The best observation is

- (A) I (B) II  
(C) III (D) IV

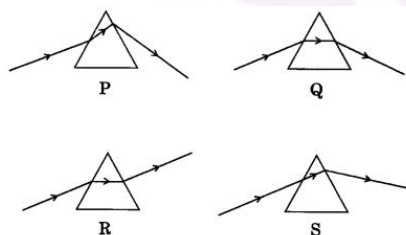
33. A student traces the path of a ray of light passing through a rectangular glass slab and marks the angle of incidence  $i$ , angle of refraction  $r$  and angle of emergence  $e$ , as shown. 1 Mark



The correctly marked angle(s)  $i$  / are

- (A)  $\angle i$  only (B)  $\angle e$  only  
(C)  $\angle r$  only (D)  $\angle i$  and  $\angle e$

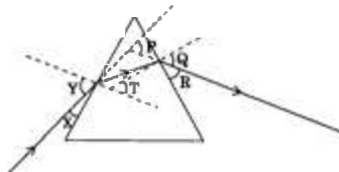
34. Study the following diagrams in which the path of a ray of light passing through a glass prism as traced by four students R, Q, R and S is shown: 1 Mark



The student who has traced the path correctly is

- (A) P  
(B) Q  
(C) R  
(D) S

35. In the following diagram, the path of a ray of light passing through a glass prism is shown : 1 Mark



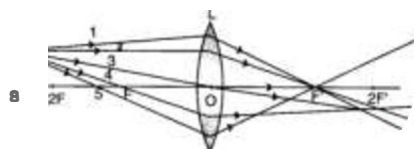
In this diagram the angle of incidence, the angle of emergence and the angle of deviation respectively are (select the correct option): 1

- (A) X, R and T (B) Y, Q and T  
(C) X, Q and P (D) Y, Q and P

36. A student is using a convex lens of focal length 10 cm to study the image formation by a convex lens for the various positions of the object. In one of his observations, he may observe that when the object is placed at a distance of 20 cm from the lens, its image is formed at (select the correct option) 1 Mark

- (A) 20 cm on the other side of the lens and is of the same size, real and erect.
- (B) 40 cm on the other side of the lens and is magnified, real and inverted. '
- (C) 20 cm on the other side of the lens and is of the same size, real and inverted.
- (D) 20 cm on the other side of the lens and is of the same size, virtual and erect.

37. A student is using a convex lens of focal length 18 cm to study the image formation by it for the various positions of the object. He observes that when he places the object at 27 cm, the location of the image is at 54 cm on the other side of the lens. Identify from the following diagram the three rays that are obeying the laws of refraction and may be used to draw the corresponding ray diagram. 1 Mark



- (A) 1, 2 and 4
- (B) 1, 3 and 5
- (C) 2, 4 and 5
- (D) 2, 3 and 4

38. A student has to focus his compound microscope to observe a prepared slide showing different stages of binary fission. The steps he is likely to follow are listed below in a haphazard manner : 1 Mark

- I. Adjust the diaphragm and the mirror of the microscope so that sufficient light may enter to illuminate the slide.
- II. Fix the slide on the stage carefully.
- III. Adjust the microscope to high power and focus.
- IV. Adjust the microscope to low power and focus.

The correct sequence of the above steps to observe the slide under the microscope is 1

- (A) I, II, IV, III
- (B) II, I, IV, III
- (C) II, IV, III, I
- (D) I, IV, II, III

39. When you study a slide showing different stages of budding in yeast, you observe the following stages: 1 Mark

- I. The bud may get separated from the parent body and develop into a new individual.
- II. The body of the bud develops and gives rise to another baby bud.
- III. A bud comes out in any direction from the body of the parent cell.
- IV. Thus they may form a colony.

The proper sequence of the above stage is 1

- (A) II, I, III, IV
- (B) II, III, I, IV
- (C) III, II, I, IV
- (D) III, I, II, IV

40. Study the following statements :

I. Wings of birds and wings of bats are homologous organs.

1 Mark

II. Wings of birds and wings of insects are modified forelimbs.

III. Wings of birds and wings of insects are analogous organs.

IV. Wings of birds and forelimbs of horse are homologous organs.

The correct statements are ;

(A) I and II (B) II and III

(C) III and IV (D) I and IV

41. Which of the following pairs of two vegetables represents the correct homologous structures ?

1 Mark

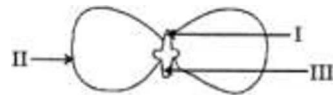
(A) Sweet potato and potato (B) Sweet potato and tomato

(C) Carrot and potato (D) Radish and carrot

42. In the following diagram showing the structure of embryo of a dicot seed, what are the parts marked I, II and

III sequentially ?

1 Mark



(A) Plumule, Cotyledon, Radicle (B) Plumule, Radicle, Cotyledon

(C) Cotyledon, Plumule, Radicle (D) Radicle, Plumule, Cotyledon