Sample/Pre-Board Paper 15

Class X Term 1 Exam Nov -Dec 2021

Science (086)

Time: 90 Minutes

General Instructions:

1. The question paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

Section A

Section – A consists of 24 questions. Attempt any 20 questions from this section.
The first attempted 20 questions would be evaluated.

1. When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of:

(a) combination reaction
(b) displacement reaction
(c) decomposition reaction
(d) double displacement reaction

2. A student placed a few drops of a liquid over a portion of the blue litmus paper as shown in figure. He observed that the blue litmus paper turned red. The liquid could be:

(a) water
(b) dilute sodium bicarbonate solution
(c) dilute hydrochloric acid
(d) dilute sodium hydroxide

3. Match the items in column I with the items in column II.

	Column I		Column II
1.	Iron	A	Liquid at room temperature
2.	Copper	B	Deposition of reddish-brown layer on exposure to moist air.
3.	Potassium	C	Can be cut easily with a knife.
4.	Mercury	D	Formation of a greenish layer on exposure to moist air.

Select the correct alternative.

(a) 1- A, 2- C, 3- D, 4- B
(b) 1- B, 2- D, 3- C, 4- A
(c) 1- C, 2- A, 3- B, 4- D
(d) 1- D, 2- B, 3- A, 4- C

4. A solution of substance X is used for white washing. Here X is:

(a) CaO (b) CaO_2
(c) NaCl (d) KCl

5. Calcium phosphate is present in tooth enamel. Its nature is

(a) basic (b) acidic
(c) neutral (d) amphoteric

6. $BaCl_2 + H_2SO_4 \longrightarrow XBaSO_4 + YHCl$

The value of X and Y in the above chemical equation are:

(a) 1, 2 (b) 2, 1
(c) 1, 1 (d) 1, 3

7. Which of the following statement is correct regarding to chemical equation?

(a) A chemical equation does not indicate about the condition for the reaction.
(b) It gives the idea about the rate of reaction.
(c) It gives the information about the heat.
(d) It gives idea about the mechanism of the reaction.

8. A student takes 2 ml acetic acid in a dry test tube and adds a pinch of sodium hydrogen carbonate to it. He makes the following observations:

I. 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 which is brough near it.

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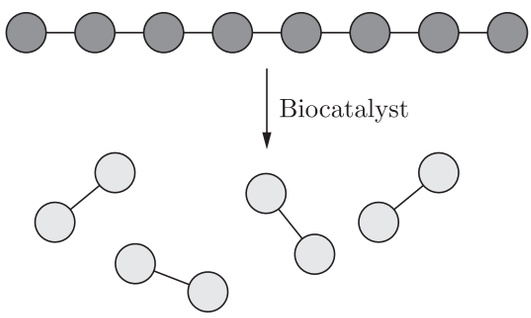
The correct observations are:
(a) I, II and III (b) II, III and IV
(c) III, IV and I (d) IV, I and II

9. Which of the following is more acidic in nature?
(a) Baking soda (b) Lime water
(c) Lemon (d) Apple

10. The reaction $2Na + Cl_2 \longrightarrow 2NaCl$ is an example of
(a) combination reaction
(b) decomposition reaction
(c) displacement reaction
(d) double displacement reaction

11. Study the picture below that represents the mode of action of a biocatalyst.



Choose the correct combination of plots provided in the following table.

	Biocatalyst also termed as	**Biocatalyst found in human saliva**	**Biocatalyst produced in human stomach**
(a)	Enzymes	Amylase	Pepsin
(b)	Hormones	Amylase	Trypsin
(c)	Enzymes	Trypsin	Pepsin
(d)	Energy	Pepsin	Amylase

12. Most of the plant's nitrogen, phosphorus, iron and magnesium are taken up from the
(a) Aquatic sources (b) Soil
(c) Mountains (d) Sea water

13. Those reactions which are most common chemical means to break-down molecules are:
(a) Oxidizing-reducing reactions
(b) Hibernation
(c) Chemical reaction
(d) Needed for well being

14. Contraction of auricles of the heart is called ..... .
(a) Systole (b) Diastole
(c) Heart beat (d) Hypertension

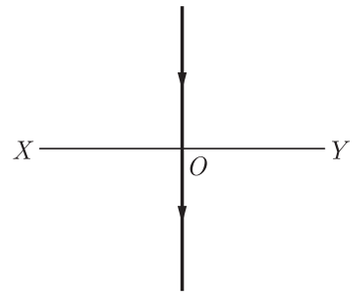
15. Which instrument is used to measure blood pressure?
(a) Thermometer (b) Electrocardiograph
(c) Pulse recorder (d) Sphygmomanometer

16. Amphibians or many reptiles have .....hearts.
(a) two-chambered (b) three-chambered
(c) four-chambered (d) five-chambered

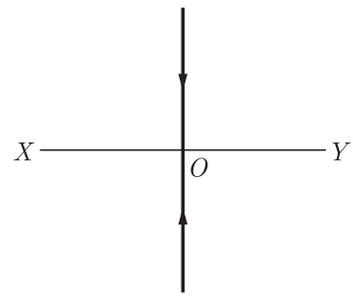
17. In vacuum the speed of light depends upon
(a) Frequency
(b) Wavelength
(c) Velocity of the source of light
(d) None of these

18. Which of the following figures shows no refraction of light when it is incident normally on a boundary of two media?

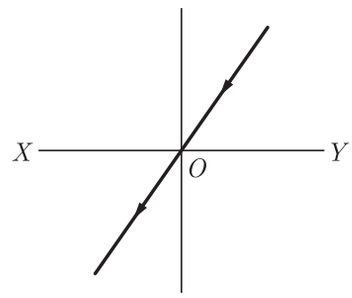
(a)



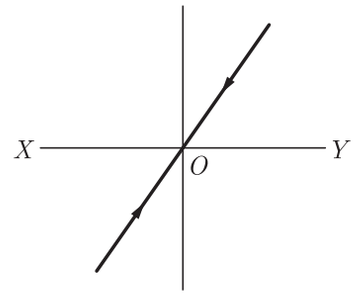
(b)



(c)



(d)



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19. Given a point source of light, which of the following can produce a parallel beam of light?
(a) Convex mirror
(b) Concave mirror
(c) Concave lens
(d) Two plane mirrors inclined at an angle of 90°

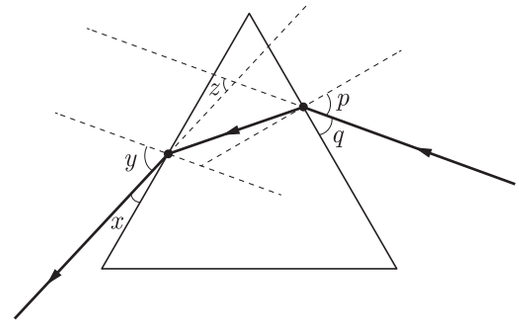
20. A concave lens always gives a virtual image. In optical lenses worn by humans which of the following statements is true?
(a) The lens can never be concave.
(b) In some cases the lens can be concave if the focal length is much larger than 2.5 cm.
(c) All focal length concave lenses are possible.
(d) All focal length convex lenses are possible.

21. Amount of light entering into the camera depends upon:
(a) focal length of objective lens.
(b) product of focal length and diameter of objective lens.
(c) distance of objective form camera.
(d) aperture setting of the camera.

22. An object is placed at a distance f in the front of a convex mirror. If focal length of the mirror is f, then distance of image from pole of the mirror is
(a) f (b) $2f$
(c) $\frac{f}{2}$ (d) $\frac{f}{4}$

23. The refractive indices of water and glass are 1.2 and 1.5 respectively. What will be the refractive index of glass with respect to water ?
(a) 1.75 (b) 1.25
(c) 0.8 (d) 0.6

24. Study the following ray diagram:



In this diagram, the angle of incidence, the angle of emergence and the angle of deviation respectively have been represented by
(a) y, p, z (b) x, q, z
(c) p, y, z (d) p, z, y

Section B

Section - B consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

25. On putting few drops of an unknown liquid on pH strip, the colour of pH strip changed to green. The liquid taken is likely to be:
(a) dilute sodium hydroxide solution
(b) lemon juice
(c) dilute hydrochloric acid
(d) water

26. Which of the following are correctly matched?

1.	Bleaching powder	oxidising agent in chemical industries.
2.	Baking powder	a mixture of sodium hydrogen carbonate and a mild edible acid.
3.	Washing soda	remove permanent hardness of water.

(a) 1 and 2
(b) 2 and 3
(c) 1 and 3
(d) 1, 2 and 3

27. Metals tend to have high melting points of the strength of ..... bond.
(a) Metallic (b) Ionic
(c) Compound (d) None of these

28. Which of the following cannot be beaten into thin sheets?
(a) Ar (b) Zn
(c) Al (d) K

29. An element X reacts with dilute H_2SO_4 as well as with NaOH to produce salt and $H_2(g)$. Hence, it may be concluded that :
1. X is an electro-positive element.
2. oxide of X is basic in nature.
3. oxide of X is acidic in nature.
4. X is an electronegative element.
(a) 1, 2, 3
(b) 4, 1, 2
(c) 3, 4, 1
(d) 2, 3, 4

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30. Which of the following can undergo a chemical reaction?

(a) $MgSO_4 + Fe$ (b) $ZnSO_4 + Fe$

(c) $MgSO_4 + Pb$ (d) $CuSO_4 + Fe$

31. **Assertion :** Alloying is a good method of improving the properties of a metal.
Reason : We can be differentiated from non metals.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Both Assertion and Reason are false.

32. **Assertion :** Decomposition reactions are similar to combination reactions.
Reason : Both reactions need a catalyst to occur.

(a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.

(b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.

(c) Assertion is True but the Reason is False.

(d) Both Assertion and Reason are False.

33. **Assertion :** Dark phase reactions take place at night.
Reason : Dark phase is independent of light, hence, called light independent phase.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Both Assertion and Reason are false.

34. **Assertion :** Concave mirror has a real focus.
Reason : Concave mirror always forms real image.

(a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Both Assertion and Reason are false.

35. 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount of HCl solution (the same solution as before) required to neutralise it will be-

(a) 4 mL (b) 8 mL

(c) 12 mL (d) 16 mL

36. Which of the following are combination reaction?

1. $2KClO_3 \xrightarrow{\text{Heat}} 2KCl + 3O_2$
2. $MgO + H_2O \longrightarrow Mg(OH)_2$
3. $4Al + 3O_2 \longrightarrow 2Al_2O_3$
4. $Zn + FeSO_4 \longrightarrow ZnSO_4 + Fe$

(a) 1 and 3 (b) 3 and 4

(c) 2 and 4 (d) 2 and 3

37. How many pairs of salivary glands are found in humans?

(a) Four (b) Two

(c) Three (d) Six

38. Which of the following is the correct features of 'lymph'?

(a) It is similar to the plasma of blood, colourless and contain less protein.

(b) Similar to the WBC of blood, colourless and contain more protein.

(c) Similar to the RBC of blood and red in colour.

(d) It contains more fat

39. Which of the following lenses would you prefer to use while reading small letters found in a dictionary?

(a) A convex lens of focal length 50 cm.

(b) A convex lens of focal length 50 cm.

(c) A convex lens of focal length 5 cm.

(d) A concave lens of focal length 5 cm.

40. In an experiment with a rectangular glass slab, a student observed that a ray of light incident at an angle of 55° with the normal on one face of the slab, after refraction strikes the opposite face of the slab before merging out into air making an angle of 40° with the normal. What value would you assign to the angle of refraction and angle of emergence?

(a) 40°, 55° (b) 55°, 40°

(c) 10°, 20° (d) 40°, 90°

41. The cycle in which pyruvic acid is broken down in presence of oxygen is known as?

(a) Glycolysis

(b) Krebs cycle

(c) Anaerobic respiration

(d) None of the above

42. Which instrument is used to measure blood pressure?

(a) Thermometer

(b) Electrocardiograph

(c) Pulse recorder

(d) Sphygmomanometer

43. An object is placed 20 cm from the concave mirror of focal length 10 cm, then image is formed at

(a) centre of curvature of mirror

(b) behind the mirror

(c) between the mirror and focus

(d) at focus

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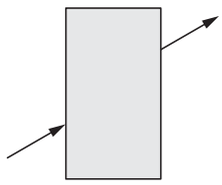
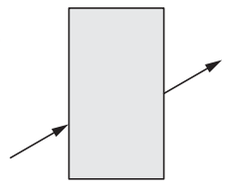
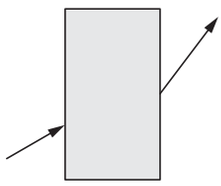
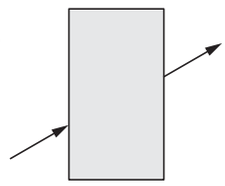
44. Four students showed the following traces of the path of a ray of light passing through a rectangular glass slab.
The trace most likely to be correct is that of student :

(a) 

(b) 

(c) 

(d) 

45. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object?
(a) Between the principal focus and the centre of curvature
(b) At the centre of curvature
(c) Beyond the centre of curvature
(d) Between the pole of the mirror and its principal focus.

46. In torches, search light and headlights of vehicles the bulb is placed
(a) Between the pole and focus of the reflector
(b) Very near to the focus of the reflector
(c) Between the focus and centre of curvature of the reflector
(d) At the centre of curvature of the reflector

47. A ray of light incident normally on the mirror, retraces its path on reflection. Which of the following is true?
(a) $\angle i = \angle r = 90^\circ$
(b) $\angle i + \angle r = 90^\circ$
(c) $\angle i - \angle r = 0^\circ$
(d) $\angle i = \angle r = 0^\circ$

48. The non-metal which is hard is
(a) sulphur (b) chlorine
(c) graphite (d) diamond

Section C

Section- C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section.
The first attempted 10 questions would be evaluated

Case Based Questions: (49-52)

Baking soda is also called sodium bicarbonate. This is the major constituent of baking powder.
Sodium chloride is used as one of the raw materials in the production of baking soda. Baking soda is commonly used to make crispy pakoras, etc., in the kitchen. It is also added for faster cooking. It is also used in the preparation of effervescent drinks and fruit salts and it is used as an antacid, it neutralises excess acid in the stomach.

49. The chemical name of baking soda is
(a) sodium hydrogen carbonate
(b) sodium hydroxide
(c) sodium carbonate decahydrate
(d) calcium oxychloride

50. Which of the following statements is correct regarding properties of baking soda?
(a) It is a yellow crystalline substance.
(b) It is non-corrosive in nature.
(c) It reacts with acids evolving hydrogen gas.
(d) All are correct

51. The temperature above which sodium bicarbonate decomposes to give sodium carbonate is
(a) 283 K (b) 309 K
(c) 373 K (d) 575 K

52. Baking powder is a mixture of
(a) sodium carbonate and ethanoic acid
(b) sodium hydrogen carbonate and ethanoic acid
(c) sodium carbonate and tartaric acid
(d) sodium hydrogen carbonate and tartaric acid

Case Based Questions: (53-56)

Some tiny pores are present on the surface of the leaves. Massive amounts of gaseous exchange take place in the leaves through these pores for the purpose of photosynthesis. But it is important to note here that exchange of gases occurs across the surface of stems, roots and leaves as well. Since, large amounts of water can also be lost through these, the plant closes these pores when it does not need carbon dioxide for photosynthesis. The opening and closing of the pores is a function of some specialized cells. These cells swell when water flows into them, causing the pore to open. Similarly, the pore closes if these cells get shrink.

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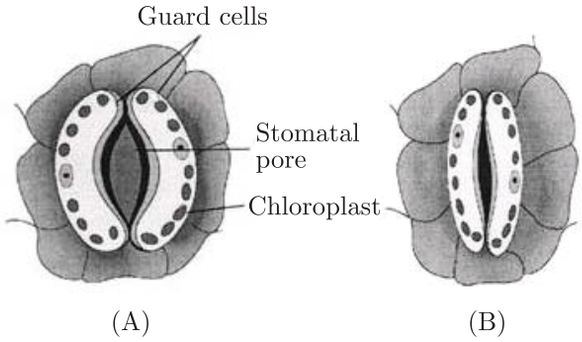
53. The exchange of oxygen and carbon dioxide in the leaf occurs through

(a) phloem (b) stomata

(c) xylem (d) alveoli

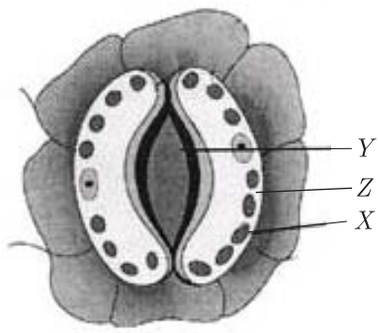
54. The given figure shows two states of a pore, opening and closing of these pores is a function of



(a) epidermis (b) chlorophyll

(c) guard cells (d) phloem cells

55. The labelling for the slide of leaf peel showing stomata by the four students who made the diagram and tabulated the labels, is as follows:



Choose the correct combination of plots provided in the following table.

	X	***Y***	***Z***
(a)	Chloroplast	Guard cell	Stoma
(b)	Chloroplast	Stoma	Guard cell
(c)	Guard cell	Stoma	Chloroplast
(d)	Stoma	Chloroplast	Guard cell

56. Which of the following statement(s) is (are) true about stomata?

I. These are typically found in leaves only.

II. Guard cells are responsible for regulating the size of the stomatal opening.

III. These control the exchange of gases not water vapours.

IV. These get closed at night to prevent water loss in plants.

(a) I and II only

(b) II and IV only

(c) I, II and III only

(d) I, III and IV only

Case Based Questions: (57-60)

A real image (always inverted) is the one through which the rays of light actually pass after reflection from concave mirror and which can be formed on a screen. A virtual image (always erect) is the one through which the rays do not actually pass, although they appear to come from it. The position, nature and size of the image of an object formed by a concave mirror changes with the position of the object. The size of image may be determined by using a graph paper fixed on the screen.

Object	**Image**	**Nature of the image**
$u = \infty$	$v = f$	Real, inverted and highly diminished
$\infty > u > 2f$	$2f < v < \infty$	Real inverted and diminished
$u = 2f$	$v = 2f$	Real inverted and same size
$2f > u > f$	$2f < v < \infty$	Real inverted and enlarged
$u = f$	$v = \infty$	Real inverted and highly enlarged
$f > u > 0$	Behind the mirror	Virtual, erect and enlarged

57. Which of the following mirror is used by a dentist to examine a small cavity?

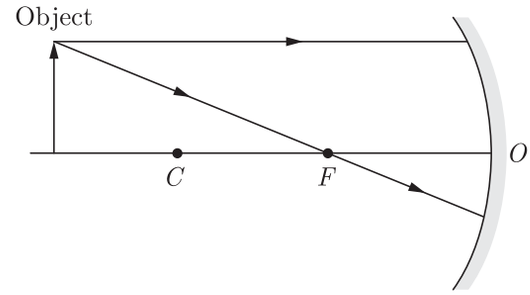
(a) Concave mirror

(b) Convex mirror

(c) Combination of (a) and (b)

(d) None of these

58. The image shows the path of incident rays to a concave mirror.



Where would the reflected rays meet for the image formation to take place?

(a) Between F and O (b) Beyond C

(c) Between C and F (d) Behind the mirror

59. A student conducts an activity using a concave mirror with focal length of 10 cm.
He placed the object 15 cm from the mirror. Where is the image likely to form?

(a) At 6 cm in front of the mirror

(b) At 6 cm behind the mirror

(c) At 30 cm behind the mirror

(d) At 30 cm in front of the mirror

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60. Rekha placed a juice bottle at a distance of 20 cm in front of a convex mirror which has a focal length of 20 cm. Where is the image likely to form?

(a) At a distance of 10 cm in front of the mirror

(b) At focus in front of the mirror

(c) At a distance of 10 cm behind the mirror

(d) At focus behind the mirror

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SAMPLE PAPER - 10 Answer Key

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
1	(d)	Ch-1	121
2	(c)	Ch-2	177
3	(b)	Ch-3	103
4	(a)	Ch-1	21
5	(a)	Ch-2	10
6	(a)	Ch-1	99
7	(a)	Ch-1	91
8	(d)	Ch-2	98
9	(c)	Ch-2	76
10	(a)	Ch-1	116
11	(a)	Ch-4	285
12	(b)	Ch-4	41
13	(a)	Ch-4	9
14	(a)	Ch-4	89
15	(d)	Ch-4	90
16	(b)	Ch-4	91
17	(d)	Ch-5	80
18	(a)	Ch-5	108
19	(b)	Ch-5	131
20	(b)	Ch-5	138
21	(d)	Ch-5	139
22	(c)	Ch-5	156
23	(b)	Ch-5	157
24	(c)	Ch-6	46
25	(d)	Ch-2	183
26	(d)	Ch-2	42
27	(a)	Ch-3	125
28	(a)	Ch-3	16
29	(a)	Ch-2	58
30	(d)	Ch-3	82
31	(a)	Ch-3	147

Paper Q. no.	Correct Option	Chapter no	Question Bank Q. no.
32	(d)	Ch-1	158
33	(c)	Ch-4	231
34	(c)	Ch-6	191
35	(d)	Ch-2	3
36	(d)	Ch-1	76
37	(c)	Ch-4	166
38	(a)	Ch-4	191
39	(c)	Ch-5	14
40	(a)	Ch-5	29
41	(b)	Ch-4	213
42	(d)	Ch-4	90
43	(a)	Ch-5	171
44	(b)	Ch-5	121
45	(d)	Ch-5	10
46	(b)	Ch-5	51
47	(d)	Ch-5	104
48	(d)	Ch-3	50
49	(a)	Ch-2	208
50	(b)	Ch-2	209
51	(c)	Ch-2	210
52	(d)	Ch-2	211
53	(b)	Ch-4	288
54	(c)	Ch-4	289
55	(b)	Ch-4	290
56	(b)	Ch-4	291
57	(a)	Ch-5	252
58	(c)	Ch-5	253
59	(d)	Ch-5	254
60	(c)	Ch-5	255

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