

FIRST TERM EXAMINATION (2024-25)
CLASS X
SUBJECT: SCIENCE

Duration: 3 hours

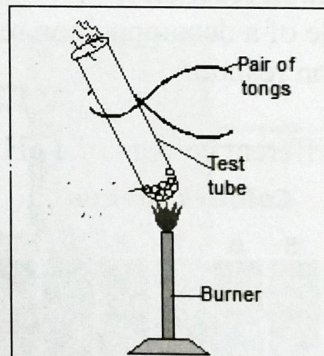
M.M: 80

General Instructions:

1. The question paper comprises of **39 questions** in all.
2. The question paper has **5 Sections**.
3. **Section-A** has 20 questions of 1 mark each
4. **Section-B** has 6 questions of 2 marks each
5. **Section-C** has 7 questions of 3 marks each
6. **Section- D** has 3 questions of 5 marks each
7. **Section- E** has 3 questions for 4 marks.
8. All questions are compulsory. However, there are internal choices in some questions.

SECTION A

- 1) Madhav took 10 g of a green salt powder in a covered beaker. He heated the beaker for 15 minutes. Madhav noticed that the salt powder turned whitish after 15 minutes. He also found some droplets on the inner surface of the beaker cover. (1)



Madhav added a few drops of water to the whitish powder. The powder turned green. What can be concluded about the green salt powder from Madhav's activity?

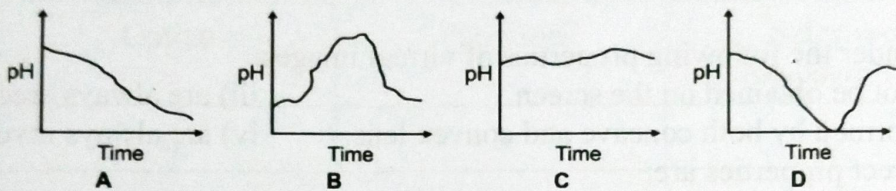
- a) Salt contains moisture
- b) Salt doesn't change any colour
- c) Salt loses water of crystallization
- d) Salt changes to new chemical on heating

	Liquid 1	Liquid 2	Liquid 3	Liquid 4
Shade of the pH paper	Colour 9	Colour 12	Colour 5	Colour 3

Which liquid has the lowest concentration of hydrogen ions?

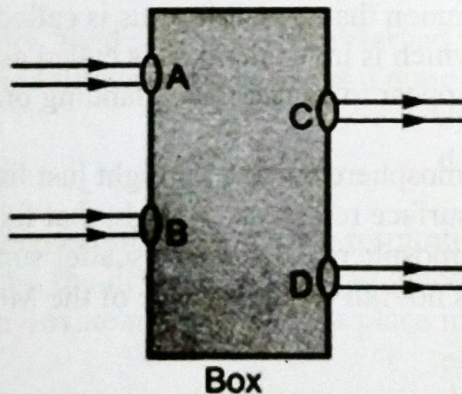
- a) Liquid 1
- b) Liquid 2
- c) Liquid 3
- d) Liquid 4

5) Which of these graphs shows how the pH of milk changes as it forms curd?



(1)

6) Beams of light are incident through the holes A and B and emerge out of box through the holes C and D respectively as shown in the figure. Which of the following could be inside the box? (1)



- a) Glass prism
- b) Rectangular glass slab
- c) Concave lens
- d) Convex lens

- 7) Which of the following statements is true? (1)
- (a) A convex lens has 4 dioptre power having a focal length 0.25 m
 - (b) A convex lens has -4 dioptre power having a focal length 0.125 m
 - (c) A concave lens has 4 dioptre power having a focal length 0.25 m
 - (d) A concave lens has -4 dioptre power having a focal length 0.125 m.

- 8) For a convex mirror the image distance (v) = 5 cm, focal length (f) = 10 cm and height of the image (h_i) = 7.5 cm. The correct representation according to sign conventions is: (1)

- a) $v = -5$ cm, $f = -10$ cm and $h_i = -7.5$ cm
- b) $v = -5$ cm, $f = +10$ cm and $h_i = -7.5$ cm
- c) $v = +5$ cm, $f = -10$ cm and $h_i = +7.5$ cm
- d) $v = +5$ cm, $f = +10$ cm and $h_i = +7.5$ cm

- 9) Consider the following properties of virtual images: (1)

- i) cannot be obtained on the screen.
- ii) are formed by both concave and convex lens.
- iii) are always erect.
- iv) are always inverted.

The correct properties are:

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

- 10) The face of the moon that is visible to us is called as the near side and the face of the moon which is invisible to us is called as far side. What colour would the sky appear to an astronaut standing on the "far side" of the moon and why? (1)

- a) Blue, as the Moon's atmosphere scatters sunlight just like Earth
- b) White, as the Moon's surface reflect all the light that falls on it
- c) Black, as there is no atmosphere on Moon to scatter sunlight
- d) Black, as sunlight does not fall on the far side of the Moon

15) Which row of the table describes a hormone?

(1)

	Mechanism	Source
a)	Nerve Signal	Brain
b)	Chemical messenger	Brain
c)	Chemical messenger	Endocrine Gland
d)	Chemical messenger	Exocrine Gland

16) The responses of the nervous system can be classified as:

(1)

- a) Voluntary, Involuntary and reflex responses
- b) Voluntary and Involuntary responses
- c) Reflex actions
- d) Only involuntary responses

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, and 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):** Hind Brain helps to bring precision in our voluntary actions. (1)

Reason (R): Cerebrum controls the balance and posture of the body.

18) **Assertion (A):** Cilia are hairlike structures on the upper respiratory tract of humans.

Reason (R): Smoking damages the cilia which leads to lung infections. (1)

19) **Assertion(A):** Danger signals are red in colour. (1)

Reason (R): Velocity of red light in air is maximum, so signals are visible even in dark.

20) **Assertion (A):** Water must always be added to acid with constant stirring. (1)

Reason (R): Mixing of an acid with water decreases the concentration of H^+ ions per unit volume

SECTION B

- 21) Silver nitrate reacts with copper to recover silver. (2)
a) Write the balanced chemical equation involved.
b) Mention the type of reaction.

22) The conditions preferred by some plants are shown in the table below:

PLANT	Apple	Potato	Black currant	Mint	Onion	Strawberry	Lettuce
pH	5.0- 6.5	4.5-6.0	6.0- 8.0	7.0- 8.0	6.0- 7.0	5.0- 7.0	6.0- 7.0

- a) Which plants grow well over the largest range of pH values? (2)
b) Which plant can grow in the most acidic soil?
c) Which plant can grow in the basic soil only?
d) What should be the colour of the pH paper when tested with the soil suitable to grow mint?

23) The refractive indices of three media are given below: (2)

Medium	Refractive Index
A	1.6
B	1.8
C	1.5

A ray of light is travelling from A to B and another ray is travelling from B to C.

- a) In which of the two cases the refracted ray bends towards the normal?
b) In which case does the speed of light increase in the second medium? Give reasons for your answer

24) Draw a ray diagram to show the formation of a rainbow in the sky. On this diagram mark B where dispersion of light occurs, C where internal reflection of light occurs and D where refraction of light occurs. (2)

- 25) There are various muscles present in the human digestive system called sphincters. Give any one specific location of a sphincter present in the digestive system. Also give one most likely consequence of malfunctioning of sphincters. (2)
- 26) How is the mode of action in beating of the heart different from reflex actions? Give four points. (2)

SECTION C

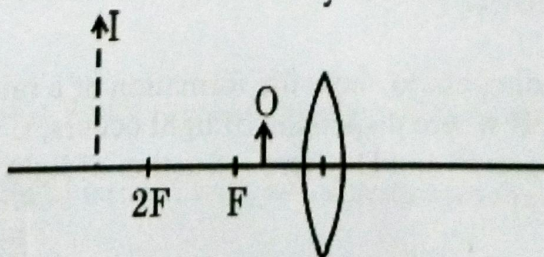
- 27) Tina finds a paper covered with a white substance in a chemistry lab. She keeps the paper near the window of the lab and comes back to pick it up after five hours to take it home. She noticed that the white substance had turned grey. (3)
- a) What could be the most likely substance on the paper that Tina found?
- b) The substance changed from white to grey. Write the chemical equation for this reaction.
- c) State ONE application of this property of the substance seen in daily life.
- 28) On adding a drop of barium chloride solution to an aqueous solution of sodium sulphite, white precipitate is obtained. (3)
- a) Write a balanced chemical equation of the reaction involved.
- b) What other name can be given to this precipitation reaction?
- c) On adding dilute hydrochloric acid, white precipitate disappears. Why?

OR

On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed (3)

Write a balanced chemical equation of the reaction involved.

- a) Identify the type of reaction
- b) What could be the pH range of the aqueous solution of gas X?
- 29) The diagram given below shows an object O and its image I. (3)



Without actually drawing the ray diagram state the following:

- (i) Type of lens (Converging / Diverging).
- (ii) Name two optical instruments where such an image is obtained.
- (iii) List three characteristics of the image formed if this lens is replaced by a concave mirror of focal length f and an object is placed at a distance $f/2$ in front of the mirror.

- 30) A security mirror used in a big showroom has a radius of curvature 5 m. If a customer is standing at a distance of 20 m from the cash counter, find the position, nature and size of the image formed in the security mirror. (3)

OR

If the image formed by a mirror for all positions of the object placed in front of it is always diminished, erect and virtual state the type of the mirror and also draw a ray diagram to justify your answer. Write one use that such mirrors are put to and why? (3)

- 31) Human beings exhibit 'double circulation' during which the blood passes from lungs and heart. On the basis of 'double circulation', answer the following:

- a) State the route of circulation of deoxygenated blood in body. (3)
- b) Which type of circulation is seen in frogs? How is energy efficiency in such cases different from humans?

- 32) Draw the system which helps us to remove nitrogenous waste from our body and label the following: (3)

- a) Blood vessel which brings in the blood to the main organ for filtration
- b) Organ which stores the waste to be removed
- c) Organ acting like the natural dialysis chamber in humans

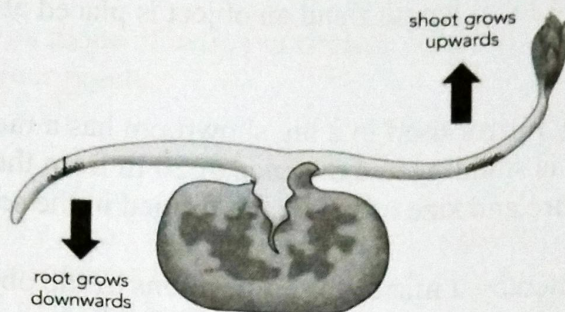
- 33) a) We are advised to take iodised salt in our diet by doctors. Justify its importance in our body. (3)
- b) Explain any one movement in plant which is independent of growth.

OR

In the following figure root is growing towards the stimulus while shoot is growing in the opposite direction. Observe the figure and answer the questions that follow: (3)

- a) State the name of the plant hormone that causes the root and shoot to develop in the way shown in the figure.
- b) Identify the stimulus that causes the roots to grow in the direction

- c) State the name of this response with respect to the given stimulus.
d) Name any stimulus for which the root and shoot would have reacted in the opposite manner. Draw a simple diagram for its explanation.



SECTION D

- 34) A compound 'X' is bitter in taste. It is a compound of washing powder and reacts with dilute HCl to produce brisk effervescence due to a colourless and odourless gas 'Y' which turns lime water milky due to formation of 'Z'. When excess of carbon dioxide is passed, milky appearance disappears due to formation of 'P'. (5)
- a) Identify X, Y, Z and P.
b) Write the equations involved in the formation of Y, Z and P.

OR

What happens when: (5)

- a) Gypsum is heated at 373 K?
b) Electricity is passed through an aqueous solution of sodium chloride?
c) Dry chlorine gas is passed over slaked lime?
d) Excess of carbon dioxide is passed through lime water?
e) Marble is treated with hydrochloric acid?
- 35) (a) How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.
(b) Is the position of a star as seen by us its true position? Justify your answer with the help of a diagram. (5)

OR

- A person needs a lens of power -4.5 D for correction of her vision. (5)
(a) What kind of defect in vision is she suffering from?

- (b) What is the focal length of the corrective lens?
- (c) What is the nature of the corrective lens? Draw a diagram to show the defect and its correction.

- 36) a) Why do arteries have thick and elastic walls whereas veins have valves?
b) How does the process of photosynthesis and respiration sustain life together?
c) why is complete oxidation of glucose better than the incomplete oxidation in the human body? (5)

OR

- a) What will happen if capillaries have thick walls? (5)
- b) Which gas is given out by the plants at night? Why is it different from day time?
- c) Give two points of difference on how is incomplete oxidation of glucose different in humans and in Yeast

SECTION E

37) Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloric acid and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salt which was formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, and bleaching powder.

Answer the following questions: (4)

- a) Identify the parent acid and base for ammonium chloride salt.
- b) How does NaCl occur in nature?
- c) Explain with the help of a diagram how NaCl is used to make caustic soda? Highlight the products formed in the process.

38) Study the data given below showing the focal length of three concave mirrors A, B and C and the respective distances of objects placed in front of the mirrors:(4)

Case	Mirror	Focal Length (cm)	Object Distance (cm)
1	A	20	45
2	B	15	30
3	C	30	20

- i) In which one of the above cases the mirror will form a diminished image of the object? Justify your answer.
- ii) List two properties of the image formed in case 2.
- iii)(A) What is the nature and size of the image formed by mirror C? Draw ray diagram to justify your answer.

OR

(B) An object is placed at a distance of 18 cm from the pole of a concave mirror of focal length 12 cm. Find the position of the image formed in this case.

39) In human beings, hormonal action is largely controlled by a mechanism where the secretion of one hormone is regulated by the action of another. An example of blood glucose level is shown in the following figure. Answer the questions respectively: (4)

- a) What is the mechanism of hormone action known as?
- b) Which is the sensor X that helps in detecting blood glucose levels?
- c) What would happen if such a mechanism is absent in humans?
- d) This mechanism works to control:
 - 1) Quantity of the hormone
 - 2) Time at which the hormone is to be released
 - 3) Both 1 and 2
 - 4) None of the above

