श्री Venkateshwar International School

Sector-18, Dwarka, New Delhi-75

MID-TERM EXAMINATION (2025-26)

SCIENCE (086)

CLASS – X

Time 3 Hours **Max. Marks: 80**

General Instructions:

1. *This question paper consists of **8 printed pages having 39 questions in 5 sections.***
2. *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
3. *Section A consists of 20 objective type questions carrying 1 mark each.*
4. *Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.*
5. *Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.*
6. *Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*
7. *Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

SECTION-A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

1. Which of the following conditions is necessary for Plaster of Paris to set into a hard mass? **(1)**

(a) Mixing with alcohol (b) Heating at high temperature
(c) Mixing with water (d) Exposure to air

2. In the decomposition of lead (II) nitrate to give lead (II) oxide, nitrogen dioxide, and oxygen gas, the coefficient of nitrogen dioxide (in the balanced equation) is **(1)**

(a) 1 (b) 2 (c) 3 (d) 4

3. Which metal reacts with cold water to form metal hydroxide and hydrogen gas? **(1)**

(a) Iron (b) Calcium (c) Aluminium (d) Copper

4. Methyl orange is **(1)**

(a) red in acidic medium, yellow in basic medium.
(b) yellow in acidic medium, red in basic medium.
(c) colourless in acidic medium, red in basic medium.
(d) red in acidic medium, colourless in basic medium.

5. The electronic configurations of three elements X, Y and Z are X - 2, 8; Y - 2, 8, 7 and Z - 2, 8, 2. Which of the following statements about these elements is correct? **(1)**

(a) X is a metal (b) Y is a metal
(c) Z is a non-metal (d) Y is a non-metal and Z is a metal

6. An element 'X' on exposure to moist air turns reddish-brown and a new compound 'Y' is formed. The substance 'X' and 'Y' are **(1)**

(a) X = Fe, Y = Fe_2O_3 (b) X = Ag, Y = Ag_2S

(c) X = Cu, Y = CuO (d) X = Al, Y = Al_2O_3

7. During the preparation of HCl gas on a humid day, the gas is usually passed through the guard tube containing $CaCl_2$. The purpose of using $CaCl_2$ is **(1)**

(a) to add moisture to the HCl gas (b) to absorb HCl gas

(c) to absorb moisture from HCl gas (d) to use it as a catalyst

8. Opening and closing of stomatal pore depends on the

(a) atmospheric temperature.

(b) oxygen concentration around the stomata.

(c) carbon dioxide concentration around the stomata.

(d) water content in the guard cells. **(1)**

9. The main function of Abscisic acid in plants is

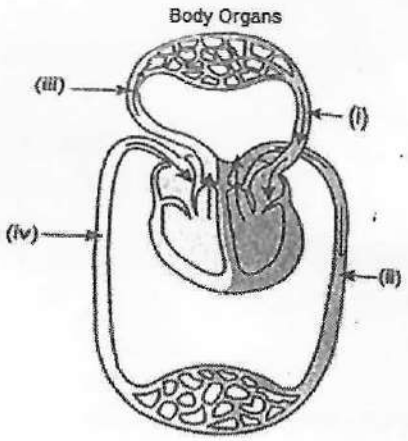
(a) to promote cell division.

(b) to inhibit growth.

(c) to promote growth of stem.

(d) to increase the length of cells. **(1)**

10. The figure given below shows a schematic plan of blood circulation in humans with labels (i) to (iv).



Identify the correct label with its functions:

(a) (i) is Pulmonary vein- takes your blood from body parts.

(b) (ii) is Pulmonary artery- brings blood from lungs to heart.

(c) (iii) is Aorta- takes blood from heart to body parts.

(d) (iv) is Vena cava- takes blood from auricle to the body parts. **(1)**

11. In flowering plants, the growth of pollen tube towards the ovule is an example of

(a) hydrotropism. (b) chemotropism.

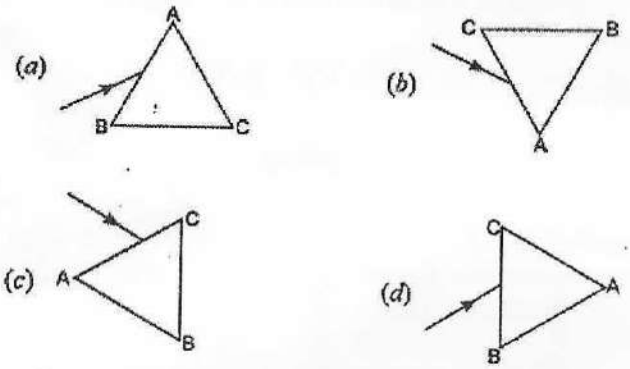
(c) phototropism. (d) geotropism. **(1)**

12. In a person, if the tubular part of the nephron is not functioning at all, what will be the effect on the urine formation?
(a) Urine will not be formed.
(b) Alkalinity of urine is affected.
(c) Urine is more concentrated.
(d) Urine is more diluted. (1)

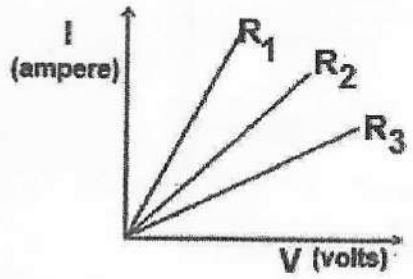
13. Mirror 'X' is used to concentrate sunlight in solar furnace and Mirror 'Y' is fitted on the side of the vehicle to see the traffic behind the driver. Which of the following statements are true for the two mirrors?
(i) The image formed by mirror 'X' is real, diminished and at its focus.
(ii) The image formed by mirror 'Y' is virtual, diminished and erect.
(iii) The image formed by mirror 'X' is virtual, diminished and erect.
(iv) The image formed by mirror 'Y' is real, diminished and at its focus.
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv) (1)

14. The phenomenon responsible for making the smoke particles visible when a beam of sunlight enters a smoke-filled room through a narrow hole is _____. (1)
(a) scattering of light
(b) dispersion of light
(c) reflection of light
(d) internal reflection of light

15. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in the figure. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky? (1)



16. A student carries out an experiment and plots the I-V graph of three samples of nichrome wire with resistances R_1, R_2 and R_3 respectively in the figure given below. (1)



Which of the following is true?
(a) $R_1 = R_2 = R_3$
(b) $R_1 > R_2 > R_3$
(c) $R_3 > R_2 > R_1$
(d) $R_2 > R_3 > R_1$

ASSERTION REASONING

In the questions numbered 17-20, a statement of Assertion (A) followed by a statement of Reason (R) is given. Choose the correct option out of the choice given below the question.

(i) Both assertion (A) and reason (R) are true, and reason (R) is the correct explanation of assertion (A).

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

(iii) Assertion (A) is true, but reason (R) is false.

(iv) Assertion (A) is false, but reason (R) is true.

17. **Assertion (A):** Aluminium is more reactive than iron but does not corrode easily.
Reason (R): Aluminium forms an impermeable oxide layer that prevents further oxidation. **(1)**

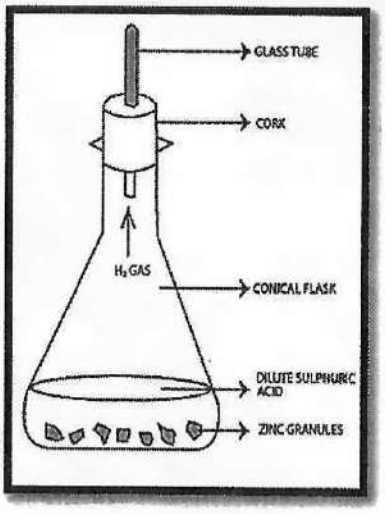
18. **Assertion (A):** Hydrochloric acid aids in the digestion of protein in the stomach.
Reason (R): Hydrochloric acid has protein digesting enzymes. **(1)**

19. **Assertion (A):** The emergent ray from a rectangular glass slab is parallel to the direction of the incident ray.
Reason (R): The extent of bending of the ray of light at the opposite parallel faces (air- glass interface and glass-air interface) of the rectangular glass slab is equal and opposite. **(1)**

20. **Assertion (A):** Various parts of the brain are responsible for integrating different inputs and outputs.
Reason (R): Spinal cord allows us to think and take action. **(1)**

SECTION-B

21. Observe the following diagram & answer the questions based on the diagram: **(2)**



(a) The temperature of the solution changes during the reaction. Justify the statement writing the reaction involved.

(b) Why all metals do not react with nitric acid?

22. (a) If the volume of blood, a kidney filters every day is 180L, then why is the volume of urine only 1-2 L per day?
(b) When a sportsman runs, he gets muscle cramps. Why? **(2)**

23. Sheela saw a snake and instantly jumped back. Then she moved away from the snake. What is the difference between her responses in terms of, instantly jumping and walking away? **(2)**

OR

"Plant growth regulators do not always promote growth."
Cite one example in support of the above statement and mention the action of the same.

24. An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm. Use lens formula to find the position of the image formed in this case. **(2)**

25. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine? Support your answer with reason. **(2)**

OR

25. Refractive index of diamond with respect to glass is 1.6 and absolute refractive index of glass is 1.5. Calculate the absolute refractive index of diamond.

26. What will happen if mucus is not secreted by the gastric glands. Name the common nutrient that is absorbed in the small intestine and reabsorbed by the kidney tubules. **(2)**

SECTION-C

27. Explain the formation of an ionic bond between magnesium and chlorine. Support your answer by showing how magnesium and chlorine achieve stable electronic configuration and write the chemical formula of the resulting compound. **(3)**

28. On adding a drop of barium chloride solution to an aqueous solution of sodium sulphite, white precipitate is obtained. Answer the questions based on the given information. **(3)**
(a) Write a balanced chemical equation for the reaction involved.
(b) What is an alternative name for a precipitation reaction?
(c) On adding dilute hydrochloric acid to the reaction mixture, white precipitate disappears. Write the balanced chemical equation for the reaction involved.

OR

28. A metal 'X', which is used in the thermite process, when heated with oxygen, gives an oxide 'Y', which is amphoteric in nature.
(a) Identify 'X' and 'Y'.
(b) Write down the reactions of oxide 'Y' with HCl and NaOH.

29. (a) If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring. Justify your answer.
(b) Bile juice does not contain any enzyme but is essential for digestion. Why is it so?
(c) A tiger has a shorter small intestine as compared to a goat. Give proper explanation to prove this statement. **(3)**

30. Name the two components of the central nervous system. How are they protected? Name the component which is considered as the highest coordinating centre of the body. (3)

31. A student has difficulty reading the blackboard while sitting in the last row. What could be the defect the student is suffering from? How can it be corrected? Draw the ray diagram for defected and corrected eye. (3)

32. A convex lens of focal length 25 cm and a concave lens of focal length 10 cm are placed in close contact with one another.
(a) What is the power of the combination?
(b) What is the focal length of the combination?
(c) Is this combination converging or diverging? (3)

33. (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 ray diagram in support of your answer.
(b) Why do stars twinkle but not the planets? (3)

SECTION – D

34. A metal carbonate 'X' on reacting with an acid gives a gas which when passed through a solution 'Y' gives the carbonate back. On the other hand, a gas 'G' that is obtained at anode during electrolysis of brine is passed on dry 'Y', it gives a compound 'Z', used for disinfecting drinking water. Answer the following questions based on the given information.

(a) Write the chemical reaction that takes place when metal carbonate 'X' reacts with an acid.
(b) What happens when electrolysis of brine takes place? Support your explanation with the help of a relevant chemical equation.
(c) Name the gases released at anode and cathode.
(d) Identify 'X', 'Y', 'G' and 'Z'. (5)

OR

34. (a) Sugandha prepares HCl gas in her school laboratory using certain chemicals. She puts both dry and wet blue litmus papers in contact with the gas. Answer the following questions based on the given information.
(i) State the colour changes observed with the dry and wet blue litmus papers.
(ii) Show the formation of ions when HCl gas combines with water.
(iii) Is an aqueous solution of hydrochloric acid a good conductor of electricity? Give a reason to support your answer.
(b) A compound P forms the enamel of teeth. It is the hardest substance of the body. It doesn't dissolve in water but gets corroded when the pH is lowered below 5.5.
(i) How does it undergo damage due to eating chocolate and sweets? What should we do to prevent tooth decay?
(ii) Name the acid and base from which calcium phosphate is obtained.

35. (i) In each of the following situations what happens to the rate of photosynthesis?
(a) Cloudy day.
(b) No rainfall in the area.
(c) Good manuring in the area.
(d) Stomata gets blocked due to dust.

(ii) Give reasons for the following:
(a) The muscular walls of the ventricles are thicker than the walls of Auricles.
(b) Arteries have thick elastic walls.
(c) Veins have valves. **(5)**

OR

35. (a) Name the following:
(i) Type of nutrition, wherein the organism harms the host for obtaining nutrition.
(ii) Process of intake of food by *Amoeba.*
(iii) An enzyme secreted from gastric glands in the stomach that acts on proteins.
(iv) Cell that surround the stomatal pore.
(v) A digestive gland that acts as an endocrine gland too.
(vi) Part of the intestine from where absorption of digested food occurs.

(b) Describe the working of an artificial kidney.

36. (a) The power of a lens 'X' is – 2·5 D. Name the lens and determine its focal length in cm. For which eye defect of vision will an optician prescribe this type of lens as a corrective lens?

(b) "The value of magnification 'm' for a lens is – 2." Using Cartesian Sign Convention and considering that an object is placed at a distance of 20 cm from the optical centre of this lens, state:
(i) the nature of the image formed.
(ii) size of the image compared to the size of the object.
(iii) position of the image. **(5)**

OR

36. (a) An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused image can be obtained? Find the size and the nature of the image.

(b) Differentiate between the virtual images formed by a convex lens and a concave lens on the basis of object distance and magnification.

SECTION - E

Case based questions: Read the paragraphs given in this section and answer the question based on your knowledge base.

37. Priya read that sodium is used in certain industrial applications. Her textbook mentioned that sodium is a soft, silvery metal and reacts vigorously with water.
(a) Why is sodium stored in kerosene? **(1)**
(b) Write the balanced chemical equation for sodium reacting with water. **(1)**
(c) What is the nature of the solution formed in the above reaction and why? **(2)**

OR

(c) Identify the gas released in the above reaction. How can it be tested in the laboratory? **(2)**

38. Body consists of dense networks of intricately arranged neurons. These neurons sit in the forward end of the skull, and receives signals from all over the body which it thinks about, before responding to them. Obviously, in order to receive these signals, this thinking part of the brain in the skull must be connected to nerves coming from various parts of the body.

(a) How does the nervous tissue cause action? **(1)**

(b) What is the function of the motor neuron? **(1)**

(c) What is reflex arc? Draw a reflex arc showing the route of nerve transmission through the flow chart. **(2)**

39. Renu wants to install a small study lamp on her desk. The lamp uses a special LED bulb that works properly when a potential difference of 12 V is applied across it.
She decides to check how the LED behaves when connected to different voltage sources.
Renu records the following data while testing the lamp in her physics lab:

Trial	Voltage (V)	Current (A)
1	6	0.15
2	9	0.225
3	12	0.30
4	15	0.375

She plots a graph between voltage (V) and current (I) and finds it to be a straight line passing through the origin.

Based on this case study, answer the following questions:

(a) Why is the graph between voltage and current a straight line passing through the origin? What does this indicate about the bulb? **(1)**

(b) Using the data, calculate the resistance of the LED bulb. **(1)**

(c) Suppose the resistance of the bulb increases when it becomes very hot. According to Ohm's law, how would this affect the current if the voltage remains the same? **(2)**

OR

(c) If Renu accidentally connects the bulb directly to the 220 V supply without the battery eliminator, what could happen? Explain why, using Ohm's law. **(2)**