O. P. JINDAL SCHOOL, SAVITRI NAGAR

Half Yearly Examination - (2026 – 2027)

Class: X **MM: 50**

Subject: SCIENCE(086) **Time: 2Hrs.**

General Instructions: All questions are compulsory.

1. *All questions are compulsory.*
2. *There are three sections in this question paper.*
3. *Section A consists of 10 questions (Q1 to Q10) of biology, section B consist of 8 questions (Q11 to 18) of chemistry and section C consists of 6 questions (Q 19 TO Q24) of physics.*
4. *There are some internal choices in some of the questions of 2 marks, 3 marks 4 marks and 5 marks in each sections.*

SECTION A

Q1. The functional unit of the kidney is: **(1M)**

(a)Neuron (b)Nephron

(c)Alveolus (d)Villus

Q2. Which part of the brain is responsible for maintaining body posture and balance? **(1M)**

(a)Cerebrum (b)Cerebellum

(c)Medulla (d)Hypothalamus

Q3. The contraction and expansion movement of the walls of the food pipe is called: **(1M)**

(a) translocation (b) transpiration

(c) peristaltic movement (d) digestion

Q4. The hormone responsible for the growth of a plant shoot towards light is: **(1M)**

(a)Cytokinin (b) Auxin

(c)Gibberellin (d)Abscisic acid

The following questions consists of one statement – Assertion (A) and Reason (R).
Answer these questions by 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

Q5. Assertion (A): The small intestine is the main site of absorption of digested food. **(1M)**
Reason (R): The inner lining of the small intestine has numerous villi that increase the surface area for absorption.

Q6. Assertion (A): Hormones act as chemical messengers. **(1M)**
Reason (R): They are secreted directly into the blood and travel to target organs.

Q7. Attempt either (A) or (B):

(A):

The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms. **(2M)**

OR

(B):

Explain how a reflex action takes place in the human body.

Q8. An old man is advised by his doctor to take less sugar in his diet. **(3M)**

(i) Name the disease from which the man is suffering.

(ii) Mention the hormone due to imbalance of which he is suffering from this disease.

(iii) Which endocrine gland secretes this hormone?

Q9. In animals, such control and coordination are provided by nervous and muscular tissues. **(4M)**

Touching a hot object is an urgent and dangerous situation for us. We need to detect it, and respond to it. How do we detect that we are touching a hot object? All information from our environment is detected by the specialised tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect smell.

(i) What are the parts of neuron?

(ii) Which part of neuron receives the information first?

(iii) At which place the electrical impulse get converted to a chemical impulse?

OR

(iii) What is neuromuscular junction?

Q10. Attempt either (A) or (B):

(A):

(i) State reasons for the following: **(5M)**

(a) Herbivores need a longer small intestine while carnivores have shorter small intestine.

(b) The lungs are designed in human beings to maximise the area for exchange of gases.

(c) Veins have valves whereas arteries do not.

(ii) Draw a neat diagram of the human excretory system and label following parts:

(a) Urethra (b) Kidney

(c) Ureter (d) Urinary bladder

OR

(B):

(i) State the two types of movements seen in plants. Give one example of each type.

(ii) Name the endocrine gland which secretes growth hormone. What will be the effect of the following on a person having?

(a) deficiency of growth hormone

(b) excess secretion of growth hormone?

(iii) Which is the largest and most prominent part of the brain?

SECTION B

Q11. Common salt besides being used in kitchen can also be used as the raw material for making: **(1M)**

(a) gypsum (b) sodium hydroxide

(c) calcium oxide (d) slaked lime

Q12. $C_6H_{12}O_6\,(aq) + 6O_2(g) \longrightarrow 6CO_2(g) + 6H_2O(l) + Heat$ **(1M)**

The above reaction is an example of:

(a) Displacement reaction (b) Endothermic reaction

(c) Exothermic reaction (d) Neutralization reaction

Q13. Study the following chemical reaction, **(1M)**

$2Na(s) + 2H_2O(l) \longrightarrow 2NaOH(aq) + H_2(g)$

The reducing agent in this reaction is

(a) Na (b) H_2O

(c) NaOH (d) H_2

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

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

(c)Assertion (A) is true, but Reason (R) is false.

(d)Assertion (A) is false, but Reason (R) is true.

Q14. Assertion(A): HCl produces H_3O^+ ion and Cl^- ion in aqueous solution. **(1M)**
Reason (R): In presence of water basic solution gives H^+ ion.

Q15.A copper wire burning in flame, gets coated with a black substance. Write the chemical equation of the reaction that takes place. How can this chemical change be reversed? **(2M)**

Q16.Attempt either(A) or (B): **(2M)**

(A):

Give reason:

(i)While diluting an acid ,it is recommended that the acid should be added to water.

(ii)Baking soda is used as an antacid.

OR

(B):

A substance X is used as building material and insoluble in water. When reacts with dil. HCl , it produces a gas which turns lime water milky. Predict the substance and write the chemical equation involved.

Q17.Attempt either (A) or (B): **(3M)**

(A):

Account for the following:

(i)White silver chloride turns grey when exposed to sunlight.

(ii)Lead(II) nitrate on heating releases brown fumes.

(iii)Magnesium ribbon must be cleaned before burning in air.

OR

(B):

What happens when:

(i) potassium iodide solution is added to lead(II)nitrate solution?

(ii)zinc is added to copper(II)chloride solution

(iii)silver metal is added to copper sulphate solution.

Q18. Washing soda is widely used for washing clothes. When it is saturated with carbon dioxide in moist environment, it gives a product called baking soda. Baking soda is used in small amount in making bread and cake. It helps to make the soft and spongy. An aqueous solution of baking soda turns red litmus blue. It is also used in soda-acid fire extinguisher. Answer the following questions based on the above information. **(4M)**

(i)Why sodium hydrogen carbonate is used in soda-acid fire extinguisher.

(ii)What is the approximate pH value of baking soda solution?

(iii)How many water of crystallization are present in washing soda? What happens when we heat the crystal?

OR

(iii)With the help of balanced chemical equation, state the reaction that takes place when sodium hydrogen carbonate is heated during cooking.

SECTION C

Q19. A convex lens and a concave lens having focal lengths 10 cm and 20 cm respectively are placed in contact with each other. Which of the following statements is correct about the lens combination? **(1M)**

(a)It will behave like a plane glass slab. (b)It will behave like a convex lens.
(c)It will behave like a concave lens. (d)It will behave like a cylindrical Lens.

Q20. The part of eye which causes change in the focal length of eye lens to provide it exceptional accommodation of power is **(1M)**

(a)Aqueous humour (b)Ciliary muscles
(c)Pupil (d)Iris

Q21. The following question consist of one statement – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

(a)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b)Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c)Assertion (A) is true, but Reason (R) is false.
(d)Assertion (A) is false, but Reason (R) is true.

Assertion (A): For a medium of given refractive index, the value of the angle of refraction corresponding to an angle of incidence is not a constant. **(1M)**
Reason (R) : With change in angle of incidence, the value of angle of refraction changes. Hence, the ratio of sine of angle of incidence to sine of angle of refraction remains constant.

Q22. Attempt either (A) or (B): **(3M)**

(A):

The various positions of an object from a convex lens and the relative sizes of the images formed in each position are tabulated below. Look at the data carefully and answer the questions that follow the table:

Sl. No.	Position of object from lens(cm)	Relative size of image (cm)
1.	45	Smaller than object
2.	30	Same size as object
3.	20	Magnified
4.	10	Magnified

(i)What is the focal length of the lens ?
(ii)What is the nature of the images formed in case of observation 3 and 4 ?

OR

(B):

(i)What is meant by Tyndall effect ?
(ii)How is scattering of light different from reflection of light ?
(iii)What will happen if white light (sunlight) is scattered from :
(a)very small particles of medium, and (b) very large particles of medium ?

Q23. A highly polished surface such as a mirror reflects most of the light falling on it. In our daily life we use two types of mirrors plane and spherical. The reflecting surface of a spherical mirrors may be curved inwards or outwards. In concave mirrors, reflection takes place from the inner surface, while in convex mirrors reflection takes place from the outer surface. **(4M)**

(i)Define the focus of a concave mirror.

(ii)A ray of light is incident on a concave mirror, parallel to its principal axis. If this ray after reflection from the mirror passes through the principal axis from a point at a distance of 10 cm from the pole of the mirror, find the radius of curvature of the mirror.

(iii)An object is placed at a distance of 10 cm from the pole of a convex mirror of focal length 15 cm. Find the position of the image.

OR

(iii)A mirror forms a virtual, erect and diminished image of an object. Identify the type of this mirror. Draw a ray diagram to show the image formation in this case.

Q24.Attempt either (A) or (B): **(5M)**

(A):

(i)Draw a neat and well labelled diagram of structure of human eye and mention the functions of any of the four parts.

(ii)State the cause of dispersion.

(B):

Noopur needs a lens of power-4.5D for correction of her vision.

(i)What kind of defect in vision is she suffering from?

(ii)What is the focal length and nature of the corrective lens?

(iii)Draw ray diagrams showing the (a) defected eye and (b) correction for this defect.

(iv)Write one cause of this defect?

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