CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-3

Time : 3 Hours **Maximum Marks : 80**

General Instructions :

(i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
(ii) All questions are compulsory.
(iii) Internal choice is given in each sections.
(iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
(v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
(vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
(vii) This question paper consists of a total of 30 questions.

SECTION A

Q1. Which one of these has a higher concentration of H^+ ions ? [1]
1 M HCl or 1 M CH_3COOH

Q2. What effect does an increase in concentration of H^+ (aq.) in a solution have on the pH of the solution? [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**
The leaf is the main photosynthetic organ in a plant. It controls gas exchange in plants, controls the amount of water loss in plants. Upper epidermis cells contain no chloroplasts – which is not true for the guard cells. They form layers on the upper and lower surface of the leaf. Their function is to prevent water from getting out and stopping unwanted substances/organisms getting in. The palisade mesophyll layer is where most of the photosynthesis occurs in the leaf. The palisade cells contain a lot of chloroplasts to help them perform this photosynthesis. Lower epidermis is the bottom layer of the leaf, and is one cell thick. They may not contain a cuticle within the lower epidermis, there are some holes found in leaves called stoma. These holes allow gases to diffuse in and out of the leaves. The stoma are formed by two highly specialized epidermis cells, called guard cells. Guard cells are the only epidermis cells that contain chloroplasts.

3.1 Mention two function of lower epidermis. [1]

3.2 Where are chloroplasts present in the leaf?

3.3 What are the functions of xylem and phloem in leaf?

3.4 List one structural and one functional difference between upper and lower epidermis.

Q4. **Question number 4.1–4.4 are based on the two tables given below study these table related to atomic number and electronic configuration and answer that follows**

Table – A

Element	Atomic number	Electronic Configuration
H	1	1
He	2	2
Li	3	2,1
Be	4	2,2
B	5	2,3

Table – B

Student	Element	Electronic configuration
Student A	C	2, 4
	N	2, 5
	O	2, 6
Student B	F	2, 7
	Ne	2, 7
	Na	2, 8, 1

4.1 In the table B which student write the incorrect electronic configuration and write the its name? [1]

4.2 How many cells are used to write the electronic configuration of element? [1]

4.3 The atomic number of sodium is [1]

(a) 11 (b) 13

(c) 14 (d) 9

4.4 If the atomic number of element is 12 than write down it's electronic configuration. [1]

(a) 2, 2, 8 (b) 2, 4, 6

(c) 2, 8, 2 (c) 2, 8, 2

Q5. In a milliammeter, there are 20 divisions between 400 mA mark and 500 mA mark. The least count of the milliammeter is [1]

(a) 0.5 mA (b) 5 mA

(c) 10 mA (d) 50 mA

OR

What is the current through a 5.0 ohm resistor if the voltage across it is 10 V ?

(a) zero (b) 0.5 A

(c) 2.0 A (d) 5.0 A

Q6. An object is placed at a distance of 10 cm in front of a plane mirror, then the distance of image from mirror will be [1]

(a) 5 cm (b) 10 cm

(c) 20 cm (d) 0

Q7. While performing the experiment to trace the path of ray through glass slab, the teacher instructed her students to ensure that during the experiment, glass slab may not get displaced from its boundary. This instruction was given because if slab gets displaced from its boundary then [1]

i. the angle of incident ray will change
ii. the diagram will not look nice
iii. the refracted ray will not be traceable

iv. the emergent ray will not be seen

(a) (i) (b) (ii)

(c) (iii) (d) (iv)

Q8. In MAIZE plant the flowers are [1]

(a) absent

(b) uni-sexual but on different plants

(c) bisexual

(d) uni-sexual but on same plant

OR

During binary fission in Amoeba nucleus divided by

(a) mitosis

(b) meiosis

(c) both mitosis and meiosis

(d) none of these

Q9. Some crystals of copper sulphate were dissolved in water. The colour of the solution obtained would be : [1]

(a) green (b) red

(c) blue (d) brown

Q10. Which of the following turn pH paper red ? [1]

(a) Milk of magnesia (b) Baking soda

(c) Oxalic acid solution (d) NaCl solution

Q11. In an experimental set up to demonstrate that CO_2 is given out during respiration, the KOH solution should be kept in [1]

(a) beaker

(b) bent tube

(c) without seeds in the flask

(d) in a small test tube in the flask

Q12. A student takes 5 ml of distilled water in 3 test tubes marked as I, II and III. He dissolves calcium chloride in test tube I, magnesium chloride in test tube II and sodium chloride in test tube III. In which tube/tubes will water behave as hard water : [1]

(a) I (b) 11

(c) III (d) I and II

OR

Chlorine reacts with saturated hydrocarbons at room temperature in the

(a) absence of sunlight

(b) presence of sunlight

(c) presence of water

(d) presence of hydrochloric acid

For question numbers 13 and 14, two statements are given-one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

(a) Assertion is true and reason is correct explanation of assertion.

(b) Assertion is true but reason is false.

(c) Assertion is false but reason is true.

(d) Both are true but reason is not correct explanation of assertion.

Q13. **Assertion**: Plaster of Paris should be stored in moisture proof containers.
Reason : Plaster of Paris on coming in contact of moisture, absorbs water and reacts chemically to form hydrated calcium sulphate, which sets to form a hard mass. [1]

Q14. **Assertion** Covalent compounds are generally good conductor of electricity.
Reason: Covalent compounds have cations and anions which can migrate to the opposite poles of an electrolytic cell. [1]

SECTION B

Q15. What are the limitations of extracting energy from:
i. wind
ii. waves
iii. tides [3]

Q16. What is ethanol? Draw the structure of ethanol molecule. How does ethanol behave with the following:
i. Sodium
ii. Excess of con. sulphuric acid at 443 K ?
Write chemical equation for each reaction. [3]

OR

Three elements A, B and C have atomic number 7, 8 and 9 respectively.
i. What would be their positions in the Modern Periodic Table (Mention group and period both)?
ii. Arrange A, B and C in the decreasing order of their size.
iii. Which one of the three elements is most reactive and why?

Q17. Write equations to show the presence of all ions in the aqueous solutions of : [3]
i. CH_3COOH
ii. H_3PO_4
iii. HI

Q18. i. Name the plant used by Mendel to carry out his experiments.
ii. Study the following cross and answer the questions that follow :

Parents Green and × Yellow and Round seed Wrinkled seed
F_1 Generation All Green and Round seeds

F_2 Generation

Green and	Green and
Round (9)	Wrinkled (3)
Yellow and	Yellow and
Round (3)	Wrinkle

(a) List the dominant and recessive characters.
(b) Are the characters linked or independent? [3]

OR

i. Differentiate between sensory neurons and motor neurons.
ii. How is brain protected in our body?
iii. Name the part of the brain responsible for precision of voluntary actions and maintaining body

posture and balance of the body.

Q19. The ozone layer is formed high up in the atmosphere by the action of ultraviolet radiation on oxygen gas. The damage of the ozone layer leads to variation in rainfall, ecological disturbances and other effects in global food supply. United Nations Environment programme (UNEP) has signed an agreement to limit this damage in 1986.

i. Where is ozone layer found in the atmosphere? [1]
ii. How is ozone layer formed in the atmosphere? [1]
iii. How can you contribute in saving the ozone layer? [1]

Q20. Mention the components of the transport system in highly organised plants. State the functions of these components. [3]

Q21. (i) Name all the digestive enzymes present in our digestive system.
(ii) Explain the process of digestion of carbohydrates, fats and proteins. [3]

Q22. i. What do you mean by dispersion of light?
ii. Draw a ray diagram to show the path of a light ray that enters the glass prism obliquely Label on it the angle of incidence and angle of deviation. [3]

Q23. i. Define the term 'volt'.
ii. Calculate the potential difference between the two terminals of a battery, if 100 joules of work is required to transfer 20 coulombs of charge from one terminal of the battery to the other.

Q24. A convex lens forms a real image 4 times magnified at a distance of 60 cm from the lens. Calculate the focal length and the power of the lens. [3]

OR

i. Define power of a lens and write its S.I unit.
ii. A convex lens of power 4 D is placed at a distance of 40 cm from a wall. At what distance from the lens should a candle be placed so that its image is formed on the wall?

SECTION C

Q25. An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide.

i. Where in the periodic table are elements X and Y placed?
ii. Classify X and Y as metal (s), non-metal(s) or metalloid(s).
iii. What will be the nature of the oxide of element Y? Identify the nature of bonding in the compound formed.
iv. Draw the electron dot structure of the divalent halide. [5]

OR

State the reason why?

i. Carbon is not used to reduce the oxides of sodium or aluminium.
ii. An iron strip is dipped in a blue copper sulphate solution turns the blue solution pale green.
iii. Metals replace hydrogen from acids whereas non-metals do not.
iv. Calcium does not occur free in nature.
v. Zinc is used in the galvanisation of iron and not the copper.

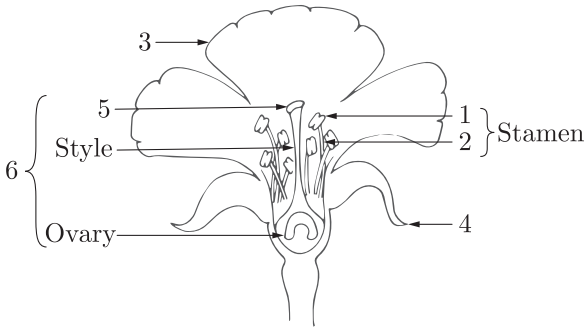
Q26. Write fully balanced equations for the reactions of : [5]

i. Sulphur dioxide and water

ii. Sodium with water
iii. Iron with oxygen
iv. Aluminium and potassium hydroxide.
v. Iron (III) oxide and dilute sulphuric acid.

Q27. i. Draw a diagram depicting the Human Alimentary Canal and label on it, Gall Bladder, Liver and Pancreas.
ii. State the roles of liver and pancreas.
iii. Name the organ which performs the following functions in humans :
(a) Absorption of digested food.
(b) Absorption of water [5]

Q28. i. In the given figure name the parts marked 1 to 6.



ii. Differentiate between self pollination and cross pollination. [5]

OR

i. Differentiate between fertilisation and germination.
ii. State in brief the functions of the following parts of the human male reproductive system :
(a) Scrotum
(b) Testes
(c) Vas deferens

Q29. Derive an expression for equivalent resistance (R), when resistors R_1, R_2, R_3 are connected in series. [5]

Q30. A student finds the writing on the blackboard as blurred and unclear when sitting on the last desk of the class room. He however sees clearly when sitting on the front desk of an approximate distance 2 m from the blackboard.
i. Draw the ray diagram to illustrate the formation of image of the blackboard writing by his eye lens when he sits at the :
(a) last desk
(b) front desk
ii. Name the defect of vision the student is suffering from. Also, list two causes of this defect.
iii. Name the kind of lens that would enable him to see clearly when he is seated at the last desk. Draw the ray diagram to illustrate how this lens helps him to see clearly. [5]

OR

i. What is meant by dispersion of light?
ii. Describe the formation of rainbow in the sky.
iii. What is meant by accommodation of eye? Name the part of eye which helps in this phenomenon and state how does it help.