

Roll No. _____

Please check that this question paper contains 39__
questions and 9__printed pages.

D.A.V. INSTITUTIONS, CHHATTISGARH-2023-24

CLASS: X
SCIENCE (086)

Time: 3 Hrs

SET-1

Max. Marks: 80

General Instructions:

1. The question paper consists of 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 answer type carrying 02 marks each. Answer 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. Answer 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 4 marks each with sub-parts.**

SECTION-A

(Select and write one most appropriate option out of the four options given for each of the questions 1-20)

1. A student took sodium sulphate solution in a test tube and added barium chloride solution to it he observed that an insoluble substance has formed, the colour and molecular formula of the insoluble substance is

- (a) Grey BaSO_4
 - (b) Yellow BaSO_4
 - (c) White BaSO_4
 - (d) Pink BaSO_4
- (1)

2. Which of the following is an example of endothermic process.

- (a) Formation of slaked lime
 - (b) Decomposition of vegetable matter into compost
 - (c) Dissolution of ammonium chloride in water
 - (d) Digestion of food in our body
- (1)

3. During electrolysis of water, if the volumes of Oxygen and hydrogen evolved at electrodes are V_O and V_H respectively then V_O / V_H is: (1)

- (a) 4
- (b) 2
- (c) $\frac{1}{2}$
- (d) $\frac{1}{4}$

4. Which of the following gives the correct increasing order of acidic strength? (1)

- (a) Sodium chloride < acetic acid < hydrochloric acid
- (b) Sodium chloride < hydrochloric acid < acetic acid
- (c) Acetic acid < sodium chloride < hydrochloric acid
- (d) Hydrochloric acid < sodium chloride < acetic acid

5. When zinc reacts with sodium hydroxide the product formed is: (1)

- (a) Sodium oxide
- (b) Sodium zincate
- (c) Zinc hydroxide
- (d) Zinc oxide

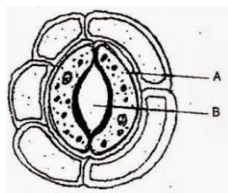
6. Which of the oxides are soluble in water to form alkalies? (1)

- (i) Na_2O (ii) SO_2 (iii) K_2O (iv) NO_2
- (a) (i) and (ii)
 - (b) (ii) and (iii)
 - (c) (ii) and (iv)
 - (d) (i) and (iii)

7. The class of organic compounds which gives effervescence with sodium hydrogen carbonate solution is (1)

- (a) Aldehydes
- (b) Alkanes
- (c) Esters
- (d) Carboxylic acid

8. Given below is the picture of tiny pores present on the green parts of the plant that help in gaseous exchange. Identify A and B in the given diagram. (1)



- (a) A –Subsidiary cell, B- stomatal pore
- (b). A-Epidermal cell ,B-Stomatal pore

(c) A-Guard cell, B- Stomatal pore

(d) A-Chloroplast , B-Stomatal pore

9. During vigorous exercise ,the occurrence of cramps in the outer muscles of an athlete is due to the conversion of pyruvate to: (1)

(a) Glucose (b) Ethanol (c) Lactic acid (d) Lactose

10. Which section of DNA provides information for one protein? (1)

(a) Chromosome (b) Nucleus (c) Gene (d) Trait

11. All the involuntary actions including blood pressure,,salivation and vomiting are controlled by following in the brain: (1)

(a) Cerebellum (b) Medulla (c) Pons (d) Cerebrum

12. The simple animals like *Planaria* be cut into a number of pieces and each piece grows into a complex organism. What is the process known as? (1)

(a) Budding (b) Fragmentation (c) Spore formation (d) Regeneration

13. At noon, the sun appears white as (1)

(a) light is least scattered (b) all the colours of the white light are scattered away

(c) blue colour is scattered the most (d) red colour is scattered the least.

14. Which of the following phenomena of light are involved in the formation of a rainbow? (1)

(a) Reflection, refraction and dispersion

(b) Refraction, dispersion and total internal reflection

(c) Refraction, dispersion and internal reflection

(d) Dispersion, scattering and total internal reflection

15. Accumulation of non-biodegradable pesticides in the food chain, in increasing amount at each higher trophic level is known as (1)

(a) Eutrophication

(b) Pollution

(c) Biomagnification

(d) Accumulation

16. The % of solar radiation absorbed by all green plants for photosynthesis is about: (1)

(a) 1%

(b) 5%

- (c) 8%
- (d) 10%

Q.no 17 to 20 are Assertion –Reasoning based questions .These consist of two statements-Assertion (A) and Reason (R).Answer these questions selecting the most appropriate option given below:

- (a) Both A and R are correct and R is the correct explanation of A
- (b) Both A and R are correct but 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) Tooth decay starts when the pH of mouth is lower than 5.5, the decay of tooth enamel begins

Reason(R): Bacteria present in mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. (1)

18.Assertion (A): Offsprings produced by sexual reproduction show variation. (1)

Reason (R): Each offspring produced by sexual reproduction inherits all the genes from each parent.

19. Assertion (A) When a charged particle enters in the direction of a uniform magnetic field, then it moves on a straight path without deviation. (1)

Reason (R) Magnetic force on a charged particle is zero, when it moves in the direction of magnetic field.

20.Assertion(A):Polythene bags and plastic containers are non-biodegradable substances. (1)

Reason(R) : They can be broken down by microorganisms in natural simple harmless substances.

SECTION-B

(Q-21 to 26 are very short answer questions)

21. What is observed when 2ml of dilute hydrochloric acid is added to 1 gram of sodium carbonate taken in a clean dry test tube? Write chemical equation for the reaction involved. (2)

22. How is the process of pollination different from the process of fertilization? (2)

23. With the help of an activity explain the action of saliva on the food we eat. (2)

OR

In Birds and mammals the left and right side of the heart are separated .Give reason.

24. Find out from table given : (2)

- (a) The medium having highest optical density.
- (b) The medium with the lowest optical density

Material medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada Balsam	1.53
Ice	1.31	Rock Salt	1.54
Water	1.33	Carbon disulphide	1.63
Alcohol	1.36	Flint Glass	1.65
Kerosene	1.44	Ruby	1.71

25. You are having three resistance of 5 ohm each. Suggest the way of combination with diagram and calculation to get resultant resistance 7.5 ohms. (2)

OR

You are having three resistance of 6 ohm each. Suggest the way of combination with diagram and calculation to get resultant resistance 4 ohms.

26. In a food chain, if 10,000 joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer it to the tertiary consumer? (2)

SECTION-C

(Q. no 27 to 33 are short answer questions)

27. Give reason : (3)

- We can not use carbon to obtain sodium from sodium oxide.
- Gold and Platinum are used for making jewellery.
- Aluminium is a highly reactive metal, yet it is used to make cooking utensils.

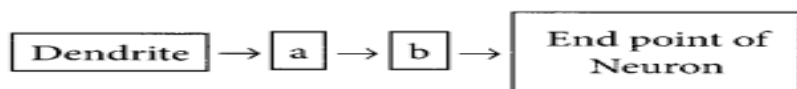
28. An acid X and alcohol Y react with each other in presence of an acid as a catalyst to form a sweet smelling substance Z (3)

- Identify X, Y, Z
- Write the chemical equation for the reaction involved and name the reaction.

OR

- Write chemical formula and name of the compound which acts as an active ingredient of alcoholic drinks.
- List two uses of this compound.
- Give the chemical equation of this compound with sodium.

29. a) State the location and function of gustatory receptors and olfactory receptors in human beings .
(b) Write a and b in the given flow chart of neuron through which information travels as an electrical impulse.



(3)

30. "The sex of the children is determined by what they inherit from their father and not their mother."
Justify. (3)

31. Akshay is unable to see the objects placed beyond 10 meters. (3)

- Identify the eye defect he is suffering from.
- What are the reasons for this eye defect?
- How can it be corrected? Explain with diagram.

32. A magnetic compass shows a deflection when placed near a current carrying wire. (3)

- How will the deflection of the compass needle get affected, if the current in the wire is increased?
- How will the direction of deflection of compass needle get affected if the direction of current through wire is reversed?

33. Write the factors affecting the resistance of a conducting wire. Define specific resistance. Give its SI unit. (1.5+1+0.5)

SECTION-D

(Q.no 34 to 36 are long answer questions)

- 34 Silver chloride kept in a china dish turns grey in sunlight . (5)

- Write the color of silver chloride when it was kept in the china dish and name the type of chemical reaction taking place .
- Write the chemical equation for the reaction.
- State one use of the reaction and name one more chemical which can be used for the same purpose.
- Lead nitrate is added to a test tube containing potassium iodide.
 - Write the name and colour of the compound precipitated..
 - Write the balanced chemical equation of the reaction involved.

OR

State what happens when (Support answers with chemical equations)

- a) Hydrated Copper sulphate is heated.
 - b) Chlorine gas is passed through slaked lime.
 - c.) On heating X at 373 K it loses water molecule and becomes Y.
- (i). Identify X and Y .Give their chemical formula.
 - (ii). How can we obtain X from Y?

35.a. a) Mention the role of the following organs of human male reproductive system. (5)

- (i) Testes (ii) Scrotum (iii) Vas deferens
- (b) What are the two roles of testosterone?

OR

- (i) State the changes that take place in the uterus when: (3)
 - a) Implantation of embryo has occurred.
 - b). Female gamete or egg is not fertilized.

(ii) How is binary fission in amoeba different from binary fission in Leishmania? (2)

36. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cms. (5)

- a) What should be the range of distance an object be placed in front of the mirror?
- b) Will the image be smaller or larger than the object? Draw a ray diagram to show the formation of image in this case.
- c) Where will the position of image of this object , if it is placed 24cm in front of the above mirror? Draw ray diagram for this situation to justify your answer. Show the position of pole, principal focus and the centre of curvature in the above ray diagram.

OR

A student wants to project the image of a candle flame on the walls of school laboratory by using a lens.

- a) Which type of lens should he use and why?
- b) At what distance in terms of focal length F of the lens should he place the candle flame, so as to get
 - (i) A magnified and (ii) diminished image respectively on the wall?
- c) Draw ray diagram to show the formation of image in each case.

SECTION-E

(Q no.37 to39 are case based/Data based questions with 2-3 short sub parts)

37. Metals like potassium and sodium react violently with cold water. In case of sodium and potassium the reaction is so violent and exothermic that the evolved hydrogen immediately catches fire .The reaction of calcium with water is less violent.

Magnesium does not react with cold water it reacts with hot water to form magnesium hydroxide and hydrogen. Metals like aluminium iron and zinc do not react either with cold water or with hot water. But they react with steam to form the metal oxide and hydrogen.

Based on the above information answer the following questions:

- How metals react with water?
- Why calcium starts floating when put in water ?
- How Sodium and calcium react with water?

OR

How magnesium and Aluminium react with water? (4)

38. Pure bred pea plant with smooth seeds (dominant characteristic) were crossed with pure bred pea plant with wrinkled seeds (recessive characteristic) . The F1 generation was self pollinated to give rise to the F2 generation.

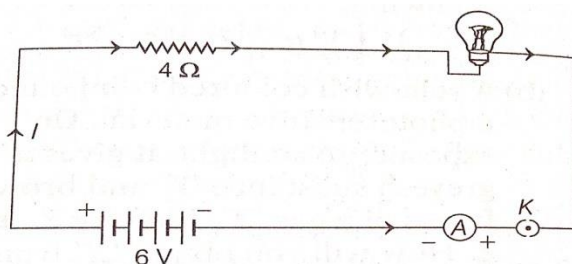
Based on the above information answer the following questions:

- What is the expected observation of the F1 generation of plants?
- What is the expected observation of the F2 generation of plants?
- What will be the genotypic ratio of F2 offspring . Mention the trait which did not appear in F1 generation but appeared in F2 generation .Why?

OR

Why did Mendel selected Pea plants for his experiments?.Give two reasons. (4)

39. An electric lamp of resistance 20 ohm and a conductor of resistance 4 ohm are connected to a 6 V battery as shown in the circuit given below:



Calculate

- a) The total resistance of the circuit. (1)
- b) The current through of the circuit. (1)
- c) The potential difference across the (i) electric lamp and (ii) conductor. (2)

OR

If all the conditions are followed in the circuit diagram, then find power of the bulb. (2)