

Roll No. _____

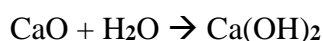
D.A.V. INSTITUTIONS, CHHATTISGARH-2023-24**CLASS -X SET-2****SUBJECT: SCIENCE****Time Allowed: 3 Hours****Maximum Marks: 80.....****General Instructions:**

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. Calcium oxide reacts vigorously with water to produce slaked lime (1)



This reaction can be classified as:

- a) combination reaction
- b) endothermic reaction
- c) exothermic reaction
- d) oxidation reaction

Which of the following is a correct option

- (a) A and C
- (b) C and D
- (c) A, C and D
- (d) A and B

2. Select a pair of olfactory indicators from the following: (1)
- (a) Clove oil and vanilla essence
 - (b) Onion and turmeric
 - (c) Clove oil and litmus
 - (d) Vanilla and methyl orange
3. In order to balance the following chemical equation, the values of coefficient of X and Y respectively are (1)
- $$X \text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + Y\text{NO}_2 + \text{O}_2$$
- a) 2,4
 - b) 2,2
 - c) 2,3
 - d) 4,2
4. Select from the following statement which is true for bases- (1)
- a) Bases are bitter and turn blue litmus red
 - b) Bases have PH value less than 7
 - c) Bases are sour and change red litmus to Blue
 - d) Bases turn pink when a drop of phenolphthalein is added to them
5. The compound which is used as an oxidising agent in many chemical industries - (1)
- a) Bleaching powder
 - b) Washing powder
 - c) Baking powder
 - d) Quicklime
6. Which of the following methods is suitable for preventing an iron frying pan from rusting (1)
- a) Applying grease
 - b) Applying paint
 - c) Applying a coating of zinc
 - d) All the above
7. Number of electron pair shared by the two carbon atoms which are bonded by triple bond molecule is- (1)
- a) One pair
 - b) Two pairs
 - c) 3 pairs
 - d) 6 pairs

8. If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be effected? (1)
- a) Proteins breaking down into amino acids.
 - b) Starch breaking down into sugars.
 - c) Absorption of vitamins.
 - d) Fats breaking down into fatty acids and glycerol.
9. When a person is suffering from severe cold, he or she can not (1)
- a) Differentiate the taste of an apple from that of an ice cream.
 - b) Differentiate the smell of a perfume from that of an agarbatti.
 - c) Differentiate red light from green light.
 - d) Differentiate a hot object from a cold object
10. Select the incorrect statement(s) (1)
- i) Minor variations are seen in sexually reproducing organisms.
 - ii) Greater variation is observed in asexually reproducing organisms.
 - iii) Accumulation of variations results in evolution.
- a) (i) and (iii) b) (ii) and (iii) c) (i) and (ii) d) only (iii)
11. Select the statements that describes characteristics of genes (1)
- i) Genes are specific sequence of bases in a DNA molecule.
 - ii) A gene does not code for proteins.
 - iii) In individuals of a given species, a specific gene is located on a particular chromosome.
 - iv) Each chromosome has only one gene.
- a) (i) and (ii) b) (i) and (iii) c) (i) and (iv) d) (ii) and (iv)
12. Lack of oxygen in muscles often leads to cramps among cricketers. This results (1)
- due to
- a) Conversion of pyruvate to ethanol.
 - b) Conversion of pyruvate to glucose.
 - c) Conversion of glucose to lactic acid.
 - d) Conversion of pyruvate to lactic acid.
13. The radius of curvature of concave mirror is 12cm. Then, the focal length will be (1)
- a).12 cm b). 6 cm c)-24 cm d)-6 cm
- Q14. No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be (1)
- a) plane b) concave c) convex d) either plane or convex

- (15) In a food chain, the third trophic level is always occupied by (1)
- a) Carnivores
 - b) Herbivores
 - c) Decomposers
 - d) Producers

- (16) Which of the following features relates to non-biodegradable substances? (1)
- a) They are biological in origin
 - b) Some of these can enter into food chain and get biologically magnified.
 - c) These are degraded by microorganisms.
 - d) These can be converted into resources such as compost.

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (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.

17. Assertion(A) :On heating gypsum at 373 K ,we obtain Plaster of Paris. (1)

Reason(R): When gypsum is heated at 373K it loses water molecules and gets converted into Plaster of Paris

18. Assertion(A): Sex is determined by different factors in various species. (1)

Reason (R): In human beings the sex of the child depends on parental chromosomes.

19. Assertion (A) The magnetic field produced by a current carrying solenoid is independent of its length and cross-sectional area. (1)

Reason (R) The magnetic field inside the solenoid has variable value

20. Assertion(A): Biodegradable wastes and non-biodegradable wastes should be discarded separately.

Reason (R): Biodegradable wastes are harmful. (1)

SECTION-B

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

Q21 a)What happens when CO₂ is passed through lime water in limited quantity? (2)

b) CO₂ is passed through lime water in excess?

22 . Give difference between Male germ cell and female germ cell. (2)

23. How do leaves of plants help in excretion? (2)

OR

State one structural and one functional difference between arteries and veins.

24. For the given data showing the focal lengths of three concave mirrors A, B and C and the respective (2) distances of different objects from these mirrors are given:

Focal Length In cm	Concave Mirror	Object Distance in cm
20	A	45
15	B	30
30	C	20

In the given positions of objects from the mirrors, which of them will form diminished images of the object and why?

25. Six wires labelled as A, B, C, D, E and F has been designed as per the following parameters (2)

Wire	Length	Diameter	Material	Resistance
A	L	2D	Aluminium	R1
B	2L	D/2	Constantan	R2
C	3L	D/2	Constantan	R3
D	L/2	3D	Copper	R4
E	2L	2D	Aluminium	R5
F	L/2	4D	Copper	R6

Answer the following questions using the above data.

a) Which of the wires has maximum resistance and why?

b) Which of the wires has minimum resistance and why?

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. a) We do not clean ponds or lakes, but aquarium needs to be cleaned regularly. Justify (2)
b) Grass---→ Deer---→ Lion--→
What will happen if all the lions are removed from the forest?

SECTION-C

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

- 27) a). Name an ore of Mercury and state the form in which mercury is present in it. (3)
b). The reaction of a metal with Fe_2O_3 is highly exothermic and used to join railway tracts.
(i) Identify the metal and name the reaction.
(ii) Write the chemical equation of the reaction.
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)
a) Identify X ,Y,Z
b) Write the chemical equation for the reaction involved and name the reaction.

OR

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

- 29.A pea plant with blue colour denoted by BB is cross-breed with white flower denoted by bb. (3)
a) What is expected colour of the flowers in their F1 progeny?
b) What will be the percentage of plants bearing white flower in F2 generation, when the flowers of F1 plants were self pollinated?
c) State the expected ratio of the genotypes BB and Bb in the F2 progeny.

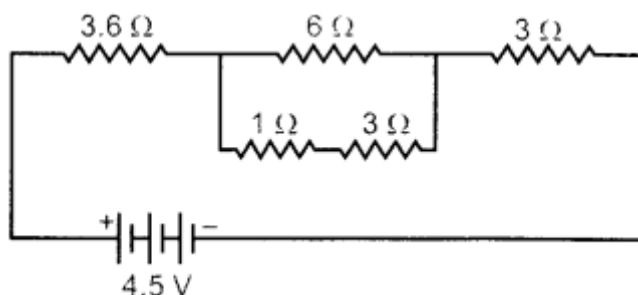
30. Why is the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron, but not the reverse? (3)

- 31) Akshay is unable to see the object closer than 1 meter. (3)
a) Identify the defect he is suffering from.
b) Give reason of the defect.
c) How it can be corrected explain with diagram.

32. A student wants to study the electromagnetic induction. He has rotated a conductive coil by a machine. Then, based on his observations, answer the following questions. (3)

- What kind of energy conversion takes place in the machine?
- In what way, the magnitude of induced current can be increased

33. Find the current flowing through the following electric circuit. (3)



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 colour 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

- What is pH range for a base?
- How the strength of basic solution can be increased ?
- Give an example of strong base and weak base.
- What is chlor-alkali process? Give its chemical equation.

35) a) Regeneration is not equated with reproduction . Justify. (5)

- What is placenta? State its role during pregnancy

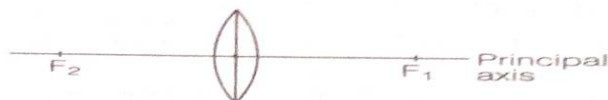
OR

Given below are certain situations. Analyse and describe its reason /impact-

- Binary fission is different in Amoeba and Leishmania.

- (b) Testes are located outside the abdominal cavity in human beings.
- (c) It is advantageous for the organisms reproducing by spores.
- (d) Blocking of Vas deferens helps in contraception.
- (e) Copying of DNA is important in the process of reproduction.

36.



The above figure shows a thin lens of focal length 5 m.

- a) What is the kind of lens shown in the above figure?
- b) If a real inverted image is to be formed by this lens at a distance of 7 m from the optical center, then show with calculation where should the object be placed?
- c) Draw a neatly labeled diagram of the image formation mentioned in case (b).

OR

A 10 cm long pencil is placed 5 cm in front of a concave mirror having a radius of curvature of 40 cm.

- a) Determine the position of the image formed by this mirror.
- b) What is the size of the image?
- c) Draw a ray diagram to show the formation of the image as mentioned above. (5)

SECTION-E

(Q no.37 to39 are case based/Data based questions with 2-3 short sub parts. Internal choice in provided in one of these 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. (4)

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 information provided answer the following questions:

- (a) How metals react with water?
- (b) Why calcium starts floating when put in water ?
- (c) How Sodium and calcium react with water?

OR

How magnesium and Aluminium react with water?

38. According to Mendel's observations, in a hybrid only one of the alleles is expressed while the other one is suppressed. An organism with two unlike alleles of a gene for a trait is called heterozygous for that particular trait. For example , pea plant with Tt alleles. It is heterozygous for height. (4)

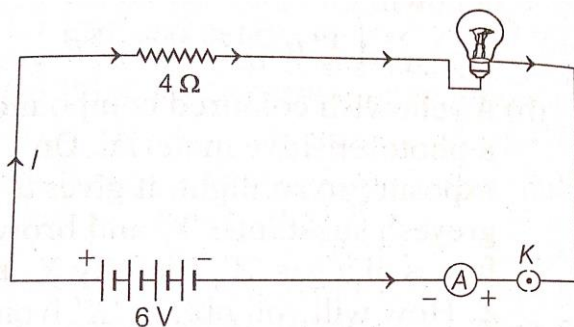
Based on the above information answer the following questions:

- a) What name is given to the allele that can not express itself in the presence of another?
- b) What is meant by homozygous organism?
- c) How do the traits get expressed?

OR

Why did Mendel select pea plant as his experimental material?

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.