

Roll No. _____

Please check that this question paper contains 39 questions and 09 printed pages.

DAV INSTITUTIONS, CHHATTISGARH

II SET SAMPLE QUESTION PAPER: 2023-24

CLASS:X

SUBJECT- SCIENCE (086)

Time: 3Hrs.

Max. Marks:80

General Instructions:

- i. *This question paper consists of 39 questions in 5 sections.*
- ii. *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
- iii. *Section A consists of 20 objective type questions carrying 1 mark each.*
- iv. *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.*
- v. *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.*
- vi. *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.*
- vii. *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 when hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. the reaction is an example of

- a) combination reaction
- b) displacement reaction
- c) decomposition reaction
- d) double displacement reaction

2. Which of the following will displace hydrogen from dilute acid

- a) Copper
- b) Gold
- c) Zinc
- d) Silver

3. Which of the following metals are refined by electrolytic refining

- a) gold
- b) Ca
- c) Na
- d) K

4. Which of the following can be used as an acid base indicator by a visually impaired student

- a) litmus
- b) vanilla essence
- c) turmeric
- d) petunia

5. Which of the following is not an ionic compounds

- a) KCl
- b) $MgCl_2$
- c) CCl_4
- d) NaCl

6. Alcoholic drinks contain

- a) Methanol
- b) Ethanol
- c) CH_3COOH
- d) CH_3COOCH_3

7 what is observed when a solution of potassium iodide is added to silver nitrate solution

- a) no reaction takes place
- b) white precipitate of silver iodide is formed
- c) yellow precipitate of AgI is formed
- d) AgI is soluble in water

8. Villi present on internal wall of intestine help in the_

- (a) Emulsification of fats.
- (b) Breakdown of proteins.
- (c) Absorption of digested food.
- (d) Digestion of carbohydrates.

9. Rings of cartilage present in the trachea ensure that_

- (a) The air passage collapses.
- (b) Air passage does not collapse.
- (c) The air is filter entering the nostrils.
- (d) None of these.

10. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose_

- (a) regeneration
- (b) budding
- (c) vegetative propagation
- (d) sexual reproduction.

11. Which one of the following juices secreted in the human body does not contain any enzyme_

- (a) Salivary juice.
- (b) Bile juice
- (c) Gastric juice
- (d) Pancreatic juice

12. The breakdown of pyruvate to give carbon dioxide water and energy takes place in_

- (a) Cytoplasm
- (b) Chloroplast
- (c) Mitochondria
- (d) Nucleus

13 In solar concentrator which of the following mirror is used

- (a) Convex
- (b) concave
- (c) plane
- (d) both b and c

14 The size of pupil of the human eye is adjusted by (a) iris (b) cornea (c) ciliary muscles (d)retina

15. Which of the following groups of organism belong to category of producers._

- (a) all green plants fungi and bacteria
- (b) all green plants and certain blue green algae.
- (c) bacteria fungi and blue green algae.
- (d) certain blue green algae and fungi .

16. Which tropic level is occupied by plants in a food chain_

- (a) first
- (b) second
- (c) Third
- (d) fourth

For QN 17 to Q20

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

17.

Assertion: hydrogen ion in aqueous solution exist independently as H^+

Reason: water molecule and H^+ ion combined to form hydronium ion

18.

Assertion: Mode of sexual reproduction allow for greater variation to be generated.

Reason: In sexual reproduction genetic material come from two different individuals.

19.

Assertion (A) : The magnetic field lines around a current carrying straight wire do not intersect each other.

REASON (R) The magnitude of the magnetic field produced at a given point increases as the current through the wire increases

20.

Assertion (A) The producers make the energy from sunlight available to the rest of the ecosystem.

REASON (R) because producers show the holozoic Nutrition.

Section-B

Question No. 21 to 26 are very short answer questions

21. When zinc metal is heated with the dilute solution of strong acid a gas is evolved which is used for the hydrogenation of oil . name the gas evolved .write a chemical equation of the reaction involved and also write a test to detect the gas formed

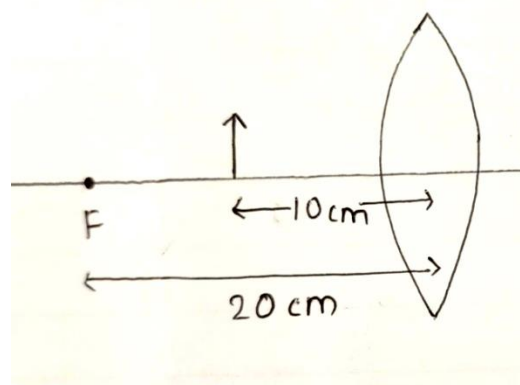
22. How does reproduction help in providing stability to populations of species?

23. What would be the consequences of a deficiency of haemoglobin in our bodies?

OR

What are the necessary conditions for autotrophic nutrition ?

24. List four characteristics of the image formed by a convex lens of focal length 20 cm when the object is placed in front of it as a distance of 10 cm from its optical centre.



25. Draw magnetic field lines in and around a current carrying straight solenoid.

OR

It is established that an electric current through a conductor produces a magnetic field around it. Is there a similar magnetic field produced around a thin beam of moving (i) alpha particles (ii) neutrons? Justify your answer in each case.

26. Why are some substances bio degradable and some non biodegradable?

Section-C

Question No. 27 to 33 are short answer questions

27.

- a) copper does not react with dilute HCl and dilute H₂SO₄. Why
- b) can we store copper sulphate solution in magnesium container
- c) hydrogen is not evolved when a metal reacts with the dilute nitric acid why

OR

Metal	Iron(II) Sulphate	Copper (II) Sulphate	Zink Sulphate	Silver nitrate
A	No Reaction	Displacement		
B	Displacement		No Reaction	
C	No Reaction	No Reaction	No Reaction	Displacement
D	No Reaction	No Reaction	No Reaction	No Reaction

Use the above table for answering the following questions

- i. which is the most reactive metal and why
- ii. what would you observe if B is added to a solution of copper sulphate
- iii. arrange the metals A,B,C and D in the order of decreasing reactivity

28. An aldehyde as well as a ketone can be represented by the same molecular formula C₃H₆O. Write the structures and IUPAC name state the relation between the two in the language of science.

29. Give reasons..

- a) Ventricles have thicker muscular wall than atria.
- b) Blood circulation in fishes is different from the blood circulation in human beings.
- c) During day time water and minerals travels faster through xylem as compared to the night.

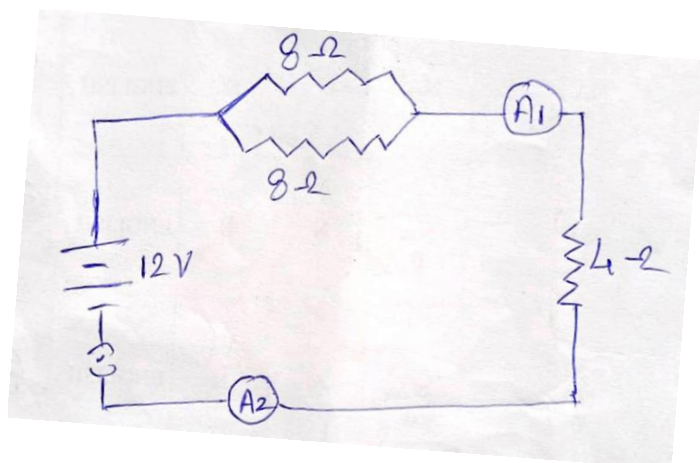
30.

- a. What do the F₁ progeny of tall plants with round seeds and short plant with wrinkled seeds look like?
- b. mention the type of new combination of plants obtained in F₂ progeny ,if F₁ progeny was allowed to self pollinate.
- c. if 1600 plants are obtained in F₂ progeny , write the number of plants having traits- Tall with round seeds and also write the conclusion of the above experiment?

31.

- What is the cause of twinkling effect of stars? Also explain why planet do not twinkle?
- What is scattering of light? Use this phenomenon to explain why danger signal are red in colour.

32 Study the following circuit and find out:



- current in $4\ \Omega$ resistor.
- Difference in the reading of A_1 and A_2 , if any.
- An electrical device of resistance R is connected across a source of voltage V and draws a current I . Derive an expression for power in terms of current and resistance.

33

A straight cylindrical conductor is suspended with its axis perpendicular to the magnetic field of a horse-shoe magnet.

- The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the
 - current through it is increased?
 - horse-shoe magnet is replaced by another stronger horse-shoe magnet?
 - direction of current through it is reversed?
- Name and state the rule for determining the direction of force on a current carrying conductor in a magnetic field.

Section-D

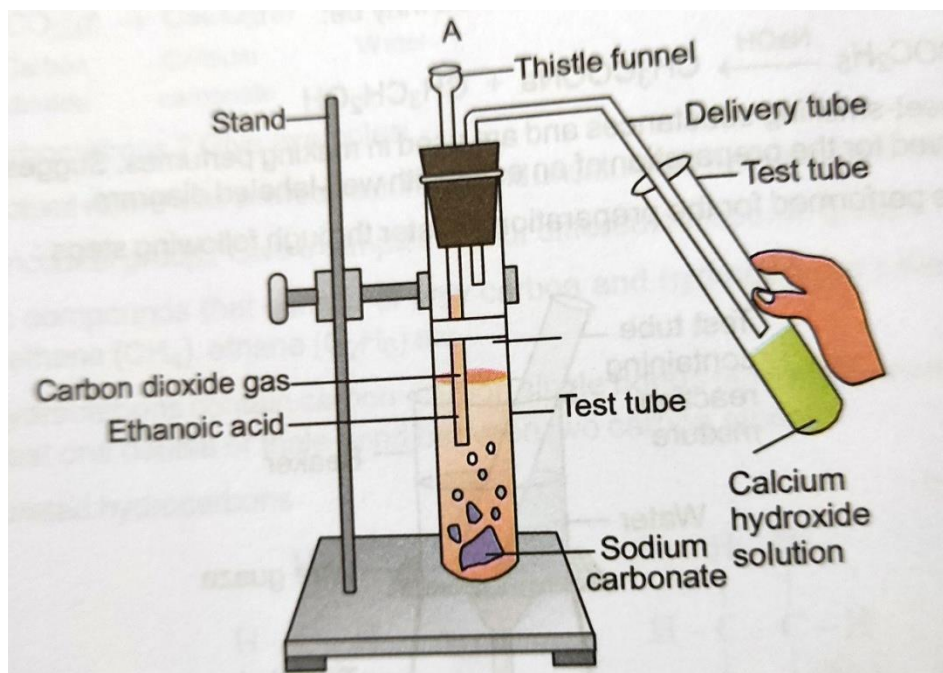
Question No. 34 to 36 are long answer questions.

34. A compound A $C_2H_4O_2$ reacts with sodium metal to form compound B and evolves a gas which burns with the pop sound compound A on treatment with alcohol C in presence of acid forms a sweet smelling compound D, $C_4H_8O_2$. on addition of $NaOH$ to D gives back B and C identify ABC and D write the reactions

OR

a) How would you bring about the following conversion. name the process and write the reactions involved

- i. ethanol to ethene
- ii. propanol to propanoic acid



- 1) write the reactions involved in test tube A&B
- 2) If ethanol is given instead of ethanoic acid would you expect the same observation

35.

- a) How is Oxygen and carbon dioxide transported in human beings?
- b) Draw a well labelled diagram of human excretory system?

OR

What are the different ways by which glucose is oxidized to provide energy in various organisms?

(b) Write any two methods used by plants to get rid of excretory products?

36.

- a) A convex lens forms a real and inverted image of a needle at a distance of 40 cm from it. Where is the needle placed in front of the convex lens if the image is equal to the size of the object ?
- b) Draw ray diagram to show the image form in above case .
- c) Also find power of that lens.
- d) If one half of the above lens is covered with a black paper. Will the lens produce a complete image of the object ? Is there is any change in the image? Justify with diagram

SECTION - E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. Alloying is a very good method of improving the properties of a metal. This gives the desired properties to the metal. For example, iron is the most widely used metal. But it is never used in its pure state. This is because pure iron is very soft and stretches easily when hot. But, if it is mixed with a small amount of carbon (about 0.05%), it becomes hard strong. When iron is mixed with nickel and chromium, we get stainless steel, which is hard and does not rust. Thus iron is mixed with some other substance, its properties change. In fact, the properties of any metal can be changed, if it is mixed with some other substance. The substance added may be a metal or a non-metal.

Answer the following questions on the basis of above information

- 1) Name 2 metals which resist corrosion due to the formation of a thin, hard and passive layer of oxide on their surface
- 2) Silver articles become black when kept in open for some time. Why?
- 3) Explain how the reduction reaction of aluminium can be used for welding cracked machine parts of iron. Write the chemical equation.

OR

Tarnished copper vessels are cleaned with lemon or tamarind juice. Explain why these substances are effective in cleaning.

38. Human beings have 46 chromosomes. Out of 46, forty-four of them are autosomes. They control functions of the body other than sex. Two chromosomes are called allosomes. They control the expression of sex and are therefore also called sex chromosomes. In human females both the allosomes are similar and are called XX. In human males the two sex chromosomes are different and are called XY. All the ova produced by females are of one type 22 + X. The females are called homogametic. The sperms produced by males are of two types 22+X and 22+Y. Human males are therefore heterogametic. The sex of the child is determined by the type of sperm that fuses with the egg.

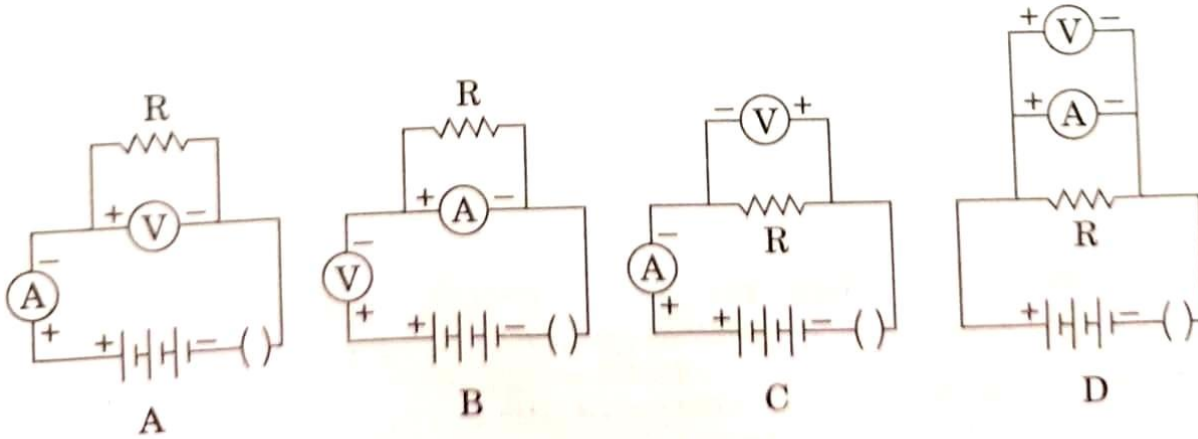
- (a) How many pairs of chromosomes are present in human beings?
- (b) Name the human sex in which the gametes are of one type.
- (c) Who is responsible for the sex of the child and why?

Or

What is the function of autosomes and allosomes?

39

For studying the dependence of the current on the potential differences across a resistor four student set up the circuit as shown .



- Which student set up is the correct circuit?
- Which physical quantity is measured by the apparatus V ,Write its SI unit.
- By which instrument current is measured in the circuit ?How that instrument is connect in the circuit?

OR

- Mention the two necessary condition under which a current can flow in a conductor.