

Sample Question Paper - 1



Time: 3 Hours

Maximum Marks: 80

Topic: CBSE 10 (Science)

General Instructions:

(i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.

(ii) **Section – A** - Question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.

(iii) **Section – B** - Question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.

(iv) **Section – C** - Question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.

(v) **Section – D** - Question no. 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.

Section – A

1. State one reason for placing Mg and Ca in the same group of the periodic table?
2. The refractive index of diamond is 2.42. What is the meaning of this statement ?
3. Write the number of covalent bonds in the molecules of butane C_4H_{10} ?
4. Make a distinction between metals and non-metals with respect to the nature of their oxide.
5. What is the role of acid in our stomach ?

OR

Name the raw material required for photosynthesis.

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6. Various steps in a food chain represent :

- (a) Food web
- (b) Trophic level
- (c) Ecosystem
- (d) Bio magnification

OR

Which of the following statement is incorrect?

- (a) All green plants and blue green algae are producers.
- (b) Green plants get their food from organic compounds.
- (c) Producers prepare their own food from inorganic compounds.
- (d) Plants convert solar energy into chemical energy.

7. Name the parts of a bisexual flower that are not directly involved in reproduction.

OR

State the number of male gametes produced by each pollen grain.

8. The electronic configuration of two elements X and Y are 2, 8, 7 and 2, 8, 8, 3 respectively. Write atomic numbers of X and Y ?

OR

Why electrical wires are made up of copper.

9. Where does aerobic respiration occur in a cell?

10. What is the magnification of the images formed by plane mirror and why?

11. Why is refractive index of atmosphere different at different altitudes?

12. Various With regard to various food chains operating in an ecosystem, man is a?

- (a) Consumer
- (b) Producer
- (c) Producer and consumer
- (d) Producer and decomposer

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If a grasshopper is eaten by a frog, then the energy transfer will be from?

- (a) producer to decomposer
- (b) producer to primary consumer
- (c) primary consumer to secondary consumer
- (d) secondary consumer to primary consumer

13. List two functions of ovary of human female reproductive system.

Directions: For question numbers 14 and 16, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a),(b), (c) & (d) as given below :

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

14. Assertion (A) : Sunlight reaches us without dispersion in the form of white light and not as its components.

Reason (R) : Dispersion takes place due to variation of refractive index for different wavelength but in vacuum the speed of light is independent of wavelength and hence vacuum is a non-dispersive medium.

15. Assertion (A) : In case of rainbow, light at the inner surface of the water drop gets internally reflected.

Reason (R) : The angle between the refracted ray and normal to the drop surface is greater than the critical angle.

16. Assertion (A) : Double fertilisation is unique to angiosperms.

Reason (R) : Triple fusion occurs in asexual reproduction.

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Assertion (A) : Surgical methods are most effective methods of contraception.

Reason (R) : Surgical method blocks gametes transport and hence prevent fertilization.

Directions : Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Read the passage and answer these questions.

A homologous series is a series of organic compounds which belong to the same family i.e. possess same functional group) and show similar chemical properties. The members of this series are called homologous and differ from each other by the number of CH_2 units in the main carbon chain.

(a) The chemical properties of which of the following compounds is similar to the butane?

- | | |
|---------------|--------------|
| (i) Butyne | (ii) Propene |
| (iii) Propyne | (iv) Pentane |

(b) The difference between two consecutive members in a homologous series in alkanes in terms of molecular mass and number of atoms of elements is :

- (i) 14 a.m.u and CH_2 respectively
- (ii) 12 a.m.u and CH_3 respectively
- (iii) 14 a.m.u and CH_2 respectively
- (iv) 12 a.m.u and CH_3 respectively

(c) The compound $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ belongs to which of the following homologous series?

- | | |
|---------------|-----------------------|
| (i) Aldehydes | (ii) Alcohols |
| (iii) Ketones | (iv) Carboxylic acids |

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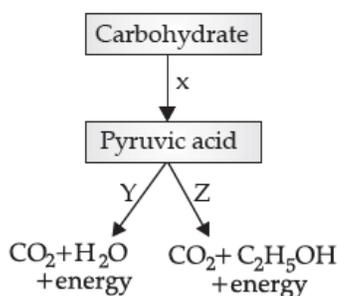
(d) Which of the following is not the property of a homologous series?

- (i) They show similar chemical properties.
- (ii) They differ by 14 units by mass.
- (iii) They all contain double bond
- (iv) They can be represented by a general formula.

(e) Which of the following represent the name and formula of the 2nd member of homologous series having general formula C_nH_{2n+2} ?

- (i) Methane, CH_4
- (ii) Ethane, C_2H_6
- (iii) Ethene, C_2H_4
- (iv) Ethyne (C_2H_2)

18. Study the given flow chart and answer any four questions



(a) Identify X, Y and Z?

- (i) X-Glycolysis, Y-Anaerobic, Z - Aerobic
- (ii) X - Krebs's cycle, Y - Aerobic, Z-Anaerobic
- (iii) X - Glycolysis, Y - Aerobic, Z - Anaerobic
- (iv) X - Glycolysis, Y - Aerobic, Z - Krebs's cycle

(b) The process X occurs in _____ and Y occurs in _____ part of cell.

- (i) Mitochondria and cytoplasm respectively
- (ii) Cytoplasm and mitochondria respectively
- (iii) Both takes place in cytoplasm
- (iv) Both takes place in mitochondria

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(c) In which of these organisms the process Z takes place?

- (i) Bacteria
- (ii) Humans
- (iii) Yeast
- (iv) Spirogyra

(d) In which part of human body do the process Z takes place?

- (i) In muscle cells
- (ii) In kidneys
- (iii) In liver cells
- (iv) In leydig's cell

(e) Where does aerobic respiration occur in a cell ?

- (i) Mitochondria
- (ii) Cytoplasm
- (iii) Nucleus
- (iv) Plastid

19. Read the given passage and answer any four questions.

Sanjana is suffering from a frequent stomach pain and vomiting. She went to the Doctor. The doctor asked her to go for an ultrasound. In the report, a stone was found in her gall bladder. Doctor asked her to remove the gall bladder by operation. But she was reluctant to go for the operation.

(a) The role played by gall bladder in human body is

- (i) To store bile
- (ii) To secrete bile
- (iii) To emulsify fats
- (iv) To digest fats

(b) Removal of gall bladder

- (i) Affects the person's health
- (ii) Has no effect on the person's health
- (iii) Effects the secretion of bile
- (iv) Effects the digestion of proteins

(c) Which of the following statement is correct about bile?

- (i) It helps in emulsification of fat.
- (ii) It helps in digestion of carbohydrates
- (iii) It helps in absorption of digested food.
- (iv) It helps in egestion of undigested food.

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(d) Which part of alimentary canal receives bile from the liver?

- (i) Stomach
- (ii) Small intestine
- (iii) Large intestine
- (iv) Oesophagus

(e) What is the function of bile salt in the intestine?

- (i) Activator of lipase
- (ii) Emulsifier
- (iii) Co factor of cholesteryl esterase
- (iv) Inhibitor of lipid absorption

20. Read the given passage and answer any four questions.

The physical states of the reactants and products can be represented by using the symbols, (s) for solids, (l) for liquids, (g) for gases and (aq) for aqueous solution along with their respective formulae. The word aqueous is written if the reactant or product is present as a solution in water. Precipitate can also be represented by using an arrow pointing downwards (\downarrow) instead of using symbol (s).

In the same way, the gaseous state of an evolved gas can be represented by using an arrow pointing upward direction (\uparrow) instead of using symbol (g). The specific condition of the reaction like temperature, pressure, catalyst etc. is written above or below the arrow in the chemical equation.

(a) Which of the following represents the correct balanced chemical equation with state symbols for the given reaction?

Magnesium reacting with dil. sulphuric acid

- (i) $\text{Mg (l)} + 2\text{H}_2\text{SO}_4 \text{ (l)} \rightarrow \text{MgSO}_4 \text{ (s)} + \text{H}_2 \text{ (l)}$
- (ii) $\text{Mg (s)} + \text{H}_2\text{SO}_4 \text{ (aq)} \rightarrow \text{MgSO}_4 \text{ (aq)} + \text{H}_2 \uparrow$
- (iii) $2\text{Mg (s)} + \text{H}_2\text{SO}_4 \text{ (aq)} \rightarrow 2\text{MgSO}_4 \text{ (aq)} + \text{H}_2 \uparrow$
- (iv) $2\text{Mg (aq)} + 2\text{H}_2\text{SO}_4 \text{ (l)} \rightarrow 2\text{MgSO}_4 \text{ (s)} + 2\text{H}_2 \text{ (l)}$

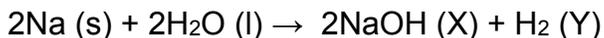
(b) To indicate the presence of gaseous reactant or product, we use _____ symbol.

- (i) (g) or \uparrow
- (ii) (l) or l
- (iii) (s) or s
- (iv) (aq) or \uparrow

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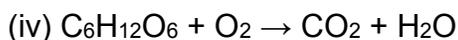
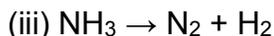
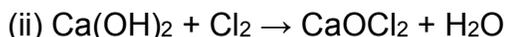
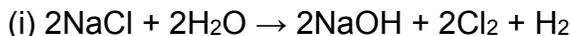


(c) Complete the missing variable given as X and Y in the following reaction?



- (i) X = (aq) and Y = (g) (ii) X = (s) and Y = (l)
(ii) X = (aq) and Y = (l) (iv) X = (s) and Y = (g)

(d) Which of the following reaction is balanced?



(e) It is necessary to balance a chemical equation in order to satisfy the law of:

- (i) Conservation of motion (ii) Conservation of momentum
(iii) Conservation of energy (iv) Conservation of mass

Section - B

21. Fresh milk has a pH of 6. When it changes into curd (Yogurt), will its pH value increases or decreases? Why?

22. State Mendeleev's periodic law. Write two achievements of Mendeleev's periodic table.

OR

The electronic configuration of an element 'X' is 2, 8, 6. To which group and period of the modern periodic table does 'X' belong. State its valency.

23. Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to eating chocolates and sweets ? What should we do to prevent it ?

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24. (a) Why did Mendel choose garden pea for his experiments? Write two reasons.
(b) List two contrasting visible characters of garden pea Mendel used for his experiment.

25. A bulb is rated 5V; 500 mA. Calculate the rated power and resistance of the bulb when it glows.

26. What are genes? Where are the genes located ?

OR

We do not clean natural ponds or lakes but an aquarium needs to be cleaned regularly. Why is it so?

Section – C

27. What is a homologous series of carbon compounds? List its any two characteristics. Write the name and formula of next higher homologous of HCOOH.

OR

Name the element with atomic number 17?

- (i) To which period does it belong?
- (ii) To which group does it belong?
- (iii) Write its electronic configuration.

28. 2ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and the test to detect the gas. Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid ?

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29. (i) Define Genetics.

(ii) Who is regarded as the 'Father of Genetics'? Name the plant on which he performed his experiment.

(iii) Why did he select that specific plant for his experiments?

30. Write the functions of the following parts of human female reproductive system :

(i) Ovary, (ii) Fallopian tube, (iii) Uterus.

31. State the cause of dispersion of white light passing through a glass prism. How did Newton show that white light of sun contains seven colours using two identical glass prisms. Draw a ray diagram to show the path of light when two identical glass prisms are arranged together in inverted position with respect to each other and a narrow beam of white light is allowed to fall obliquely on one of the focus of the first prism.

OR

Define angle of deviation. Why do different components of white light split up into spectrum when it passes through a triangular glass prism? Show the angle of deviation for red colour when white light passes through a prism.

32. Three resistors of 5Ω , 10Ω and 15Ω are connected in series and the combination is connected to the battery of 30 V. Ammeter and voltmeter are connected in the circuit. Draw a circuit diagram to connect all the devices in proper correct order. What is the current flowing and potential difference across 10Ω resistance?

33. What is solenoid? Draw the field lines of the magnetic field produced on passing current through and around a current carrying solenoid.

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Section - D

- 34.(a) List any three observations which posed a challenge to Mendeleev's Periodic Law ?
- (b) How does the metallic character of elements vary on moving from
- (i) left to right in a period,
- (ii) From top to bottom in a period of the Modern Periodic Table ? Given reason for your answer.
35. Mention the organ and site of photosynthesis in green plants. What are the raw materials essential for this process? How are they obtained? Write complete balanced chemical equation for the process. Name the by-products.

OR

- (a) Define excretion.
- (b) Name the basic filtration unit present in the kidney.
- (c) Draw excretory system in human being and label the following organs of excretory system which perform following functions.
- (i) form urine
- (ii) is a long tube which collects urine from kidney
- (iii) store urine until it is passed out.
- 36.(a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances ?
- (b) In an electric circuit two resistors of $12\ \Omega$ each are joined in parallel to a 6 V battery. Find the current drawn from the battery ?

OR

- (a) Define the following terms in the context of spherical mirrors :
- (i) Pole (ii) Centre of curvature
- (iii) Principal axis (iv) Principal focus

