

CBSE
Class X Science
Most Important Questions 2020

Chapter 1: Chemical Reactions and Equations

1. Why are decomposition reactions called the opposite of combination reactions?
[1]
2. When potassium chlorate (KClO_3) is heated in the presence of manganese dioxide catalyst, it decomposes to form potassium chloride and oxygen gas. Represent this in the form of a balanced chemical equation.
[1]
3. A solution of potassium chloride when mixed with silver nitrate solution forms an insoluble white substance. Write the chemical reaction involved and mention the type of chemical reaction.
[3]
4. Equal lengths of Mg ribbon are taken in test tubes A and B. Hydrochloric acid is added to test tube A, while acetic acid is added to test tube B. In which case the reaction would occur more vigorously and why? Write the chemical equations for reactions in test tubes A and B.
[3]
5. Describe an activity to show the decomposition reaction of ferrous sulphate in the laboratory.
[3]
6. A solution of substance 'X' is used for white washing.
[3]
 - i. Name substance 'X' and write its formula.
 - ii. Write the reaction of substance 'X' named in (i) above with water.
 - iii. Write the balanced equation for the following chemical reaction:
$$\text{Barium chloride} + \text{Aluminium sulphate} \longrightarrow \text{Barium sulphate} + \text{Aluminium chloride}$$
7. [5]
 - a) Write chemical equations for the reactions taking place when
 - i. Zinc sulphide is heated in air.
 - ii. Zinc carbonate is calcined.
 - iii. Manganese dioxide is heated with aluminium powder.

b)

- i. What happens when a strip of lead metal is placed in a solution of copper chloride? Write the balanced chemical equation for the reaction along with the colour changes observed during the reaction.
- ii. What are precipitation reactions? Give one example of a precipitation reaction.

8.

[5]

- a) A water-insoluble calcium compound (A) on reacting with dil. H_2SO_4 released a colourless and odourless gas (B) with brisk effervescence. When gas (B) was passed through lime water, the lime water turned milky and again formed compound A. Identify A and B, and write the chemical equations for the reactions involved.
- b) A brown substance 'X' on heating in air forms a compound 'Y'. When hydrogen gas is passed over 'Y', it changes to 'X' again.
 - i. Name substances 'X' and 'Y'.
 - ii. Name the processes occurring during the two changes.
 - iii. Write the chemical equations involved.

Chapter 2: Acids, Bases and Salts

1. Fresh milk has a pH of 6. How do you think pH will change as it turns into curd? Explain. [1]

2. Classify the following into acidic oxides and basic oxides: Na_2O , SO_2 , MgO , CO_2 . [1]

3. [3]

- i. Write the chemical name and formula of washing soda. How is it prepared? Write the chemical equation of the reaction.
- ii. Why should Plaster of Paris be stored in a moisture-proof container?
- iii. If we have hydrochloric acid and acetic acid in equal concentration, which will be the stronger acid and why?

4. Define 'water of crystallisation'.

Give two examples of substances having water of crystallisation.

Write their chemical formulae.

[3]

5. [3]
- Name the compound which is obtained from baking soda and is used to remove the permanent hardness of water.
 - Write its chemical formula.
 - What happens when it is recrystallised from its aqueous solution?
6. [3]
- What change will you observe in the colour of red litmus paper when it is dipped into a solution of sodium sulphate? Give reason to explain your observation.
 - A bottle filled up to the brim with concentrated sulphuric acid is left open in the atmosphere by mistake. Will there be any change in the level of liquid? Explain your answer with reasons.
7. [5]
- Write word equations and balanced equations for the reaction taking place when
 - Dilute sulphuric acid reacts with zinc granules
 - Dilute hydrochloric acid reacts with magnesium ribbon
 - What is meant by 'hydrated' and 'anhydrous' salts? Explain with examples.
 - Give two important uses of washing soda.
8. [5]
- Write the chemical equation for the preparation of
 - Bleaching powder
 - Plaster of Paris
 - Caustic soda
 - What is the chlor-alkali process? Give two uses of NaOH obtained from this process.
9. Give suitable reasons for the following statements:
- Rain water conducts electricity, whereas distilled water does not.
 - We feel a burning sensation in the stomach when we overeat.
 - On rubbing a tarnished copper vessel with lemon or tamarind juice, it begins to shine again.
 - A solution of sodium carbonate is not acidic.
 - Dry ammonia has no effect on litmus paper, whereas a solution of NH_3 in water has.

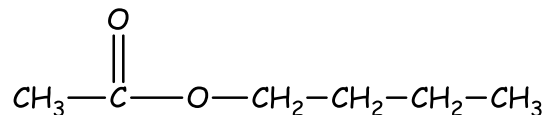
Chapter 3: Metals and Non-Metals

1. What happens when iron nails are kept in an aqueous solution of CuSO_4 ? [1]
2. Name a non-metal which is lustrous and a metal which is non-lustrous. [1]
3. What are amphoteric oxides? Give two examples. Element X on reaction with oxygen forms a dioxide XO_2 , which turns blue litmus red. Is element X a metal or a non-metal? [3]
4. [3]
 - (a) What are the two main allotropes of carbon?
 - (b) Distinguish these two allotropes on the basis of hardness and electrical conduction.
5. [3]
 - (a) What is roasting and calcination?
 - (b) What is the difference between them?
6. What happens when [3]
 - (i) Zinc reacts with copper sulphate
 - (ii) Magnesium reacts with HCl
 - (iii) Sodium reacts with water
7. Describe the use of aluminium as a reducing agent for the reduction of metal oxides. Give the equations involved. [5]
8. [5]
 - (a) Write the electronic configurations of sodium and chlorine.
 - (b) Show the formation of sodium chloride from sodium and chlorine by the transfer of electrons.
 - (c) State the type of bonding formed.
 - (d) List two properties of the compounds formed by this bonding.
9. (a) Name the metal which is extracted from haematite ore. [5]
 - (b) Name one ore of aluminium. Name the aluminium compound present in this ore and write its chemical formula.
 - (c) How is aluminium metal extracted? Explain with the help of an equation.
 - (d) Name the electrode at which aluminium metal is produced.
 - (e) Which gas is produced during the extraction of aluminium? At which electrode is this gas produced?

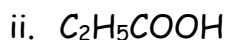
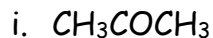
10. What is an alloy? How are alloys made? Name the constituents of (i) brass, (ii) bronze and (iii) solder. Also, give one use of each.

Chapter 4: Carbon and its Compounds

1. Write the name of the following compound. Name the acid and alcohol from which it might be prepared. [1]



2. Name the functional group present in each of the following organic compounds:[1]



3. Give a test for experimentally distinguishing between an alcohol and a carboxylic acid. Describe how these tests are performed. [3]

4. When you add sodium hydrogen carbonate to acetic acid in a test tube, a gas liberates immediately with brisk effervescence. Name this gas. Describe the method of testing this gas. [3]

5. What is meant by a homologous series of carbon compounds? Classify the following carbon compounds into two homologous series and name them.



6. Name the gas liberated when ethanol reacts with sodium metal. How do we get ethene from ethanol? Write a chemical equation to justify your answer. State the role of the acid in this reaction. [3]

7. What is saponification? What is the difference between the chemical composition of soaps and detergents? State in brief the action of soaps in removing an oily spot from a shirt. Why are soaps not considered suitable for washing when water is hard? [5]

8. (a) State two properties of carbon which lead to a large number of carbon compounds.
- (b) Describe the addition reaction of carbon compounds with applications. State the function of the catalyst in this reaction. How is this reaction different from a substitution reaction?

OR

Explain isomerism. State any four characteristics of isomers. Draw the structures of possible isomers of butane, C_4H_{10} . Also, explain why we cannot have isomers of the first three members of the alkane series. [5]

9. Compound 'C' with molecular formula $C_2H_4O_2$ reacts with sodium metal to form compound 'R' and evolves a gas which burns with a pop sound. Compound 'C' on treatment with alcohol 'A' in the presence of an acid forms a sweet-smelling compound 'S' (molecular formula $[C_3H_6O_2]$). On addition of NaOH to 'C', it also gives 'R' and water. 'S' on treatment with NaOH solution gives back 'R' and 'A'. Identify 'C', 'R', 'A', 'S' and write the reactions involved.
10. Describe the following chemical properties of carbon compounds briefly and give one chemical reaction for each:
- (i) Combustion
 - (ii) Saponification
 - (iii) Substitution
 - (iv) Esterification
 - (v) Oxidation

Chapter 5: Periodic Classification of Elements

1. How were the positions of cobalt and nickel resolved in the modern periodic table? [1]
2. What are lanthanides and actinides? [1]
3. How does the metallic character of elements change along a period of the periodic table from left to right and why? [2]
4. How does the modern periodic law justify one position for isotopes? [2]

5. State Mendeleev's periodic law. Which group of elements was missing from Mendeleev's original periodic table? Besides gallium, which two other elements have since been discovered for which Mendeleev had left gaps in his periodic table? [3]

6. How could the modern periodic law remove various anomalies of Mendeleev's periodic table? Explain with examples. [3]

7. Atoms of eight elements—A, B, C, D, E, F, G and H—have the same number of electrons in their outermost shell. Elements A and G combine to form an ionic compound. This ionic compound is added to a small amount of almost all vegetables and dishes during cooking. Oxides of elements A and B are basic in nature, while those of elements E and F are acidic. However, the oxide of element D is almost neutral. Based on the above information, answer the following questions: [5]

8.

- (i) To which group or period of the periodic table do these elements belong?
- (ii) What would be the nature of the compound formed by a combination of elements B and F?
- (iii) Which two of these elements could definitely be metals?
- (iv) Which one of the eight elements is most likely to be found in the gaseous state at room temperature?
- (v) If the number of electrons in the outermost shell of elements C and G are 3 and 7, respectively, write the formula of the compound formed by the combination of C and G.

9. Explain:

- i. Larger the atomic size, more metallic is the element.
- ii. Size of the atom changes when it loses or gains electrons.
- iii. K is more reactive than Li.
- iv. Electronegativity of Cl is higher than S.
- v. Group 17 elements are non-metals, while Group 1 elements are metals.

10.

Group Nos.							
IA	IIA	IIIA	IVA	VA	VIA	VIIA	0
1	2	13	14	15	16	17	18
Li		D			O	J	Ne
A	Mg	E	Si		H	K	
B	C		F	G			L

Select from the table:

- Which is the most electronegative?
- How many valence electrons are present in G?
- Write the formula of the compound between B and H.
- In the compound between F and J, what type of bond will be formed?
- Draw the electron dot structure for the compound formed between C and K.

Chapter 6: Life Processes

- Why do fish die when taken out of water? [1]
- Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms? [1]
- How do guard cells regulate the opening and closing of stomata? [1]
- Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds? [3]
- What are the different ways in which glucose is oxidised to provide energy in various organisms? [3]
- How are fats digested in our body? Where does this process take place? [3]
- [5]
 - Draw a well-labelled diagram of the human digestive system.
 - Describe the role of the following in the process of digestion:
 - Bile
 - Salivary amylase
 - HCl

8. [5]
- (a) Define excretion.
 - (b) Name the basic filtration unit present in the kidney.
 - (c) Draw the excretory system in human beings and label the organs of the excretory system which perform the following functions:
 - (i) forms urine
 - (ii) is a long tube which collects urine from the kidney
 - (iii) stores urine until it is passed out
9. [5]
- (a) Mention any two components of blood.
 - (b) Trace the movement of oxygenated blood in the body.
 - (c) Write the function of valves present in between the atria and ventricles.
 - (d) Write one structural difference between the composition of arteries and veins.

Chapter 7: Control and Coordination

1. Which plant hormone is responsible for the promotion of cell division? [1]
2. What will happen if the intake of iodine is low in our diet? [1]
3. Name the part of the neuron [1]
- (a) where information is acquired
 - (b) through which information travels as an electrical impulse
4. How are involuntary actions different from reflex actions? [3]
5. What happens at the synapse between two neurons? [3]
6. Name the hormones secreted by the following endocrine glands and specify one function of each: [3]
- (a) Thyroid (b) Pituitary (c) Pancreas
7. Draw a neat and well-labelled diagram of the structure of the human brain. Mention the functions of the different parts of the human brain. [5]

8. [5]
- (a) What are reflex actions?
 - (b) Explain a reflex arc.
 - (c) State the functions of
 - (i) Insulin
 - (ii) Adrenaline

Chapter 8: How do Organisms Reproduce?

1. Define cross-pollination. [1]
2. Name one sexually transmitted disease each caused by bacterial infection and viral infection. [1]
3. Where does fertilisation take place in human females? [1]
4. What is vegetative propagation? State two advantages and two disadvantages of this method. [3]
5. Name the process by which amoeba reproduces. Draw the various stages of its reproduction in a proper sequence. [3]
6. List any four methods of contraception used by humans. How does their use have a direct effect on the health and prosperity of a family? [3]
7. (a) List three differences between sexual and asexual types of reproduction.
(b) Explain why variations are observed in the offspring of sexually reproducing organisms. [5]
8. [5]
 - (a) Write the function of the following parts in the human female reproductive system:
 - (i) Ovary (ii) Oviduct (iii) Uterus
 - (b) Describe in brief the structure and function of the placenta.

9. [5]
(a) Distinguish between cross-pollination and self-pollination. Mention the site and product of fertilisation in a flower.
(b) Draw a labelled diagram of a pistil showing the following parts:
Stigma, Style, Ovary, Female Germ Cell

Chapter 9: Heredity and Evolution

1. Define speciation. [1]
2. A Mendelian experiment consisted of breeding pea plants bearing violet flowers with pea plant bearing white flowers. What will be the result in the F_1 progeny? [1]
3. Give one example each of characters which are inherited and characters which are acquired in humans. [1]
4. 'What is organic evolution? It cannot be equated with progress.' Explain with the help of a suitable example. [3]
5. How do the following provide evidence in favour of evolution in organisms? Explain with an example for each. [3]
 - (i) Homologous organs
 - (ii) Analogous organs
 - (iii) Fossils
6. State the evidence we have for the origin of life from inanimate matter. [3]
7. How are fossils formed? Describe, in brief, two methods of determining the age of fossils. [3]
8. What factors could lead to the rise of a new species? [3]
9. Explain Darwin's theory of natural selection. [3]

10. [5]
(a) 'Sex of children is determined by what they inherit from the father and not from the mother.' Justify.
(b) Explain the result of a monohybrid cross.

Chapter 10: Light - Reflection and Refraction

1. Which mirror is used as a rear-view mirror in vehicles? [1]
2. If the radius of curvature of a spherical mirror is 60 cm, what is its focal length? [1]
3. What is the nature and position of the image when an object is placed at the focus of a concave mirror? [1]
4. Draw a neat and labelled ray diagram when an object is placed in front of a convex mirror between infinity and the pole. [3]
5. What is the speed of light in a medium of refractive index 1.8 if its speed in air is 300000 km/s? [3]
6. Describe the Cartesian sign convention for a spherical lens. Draw a neat and labelled diagram to illustrate the sign convention. [3]
7. If a concave mirror has a focal length of 15 cm, find the two positions where an object can be placed to give, in each case, an image twice the height of the object. [3]
8. Draw a diagram to represent a convex mirror. On this diagram, mark the principal axis, principal focus F and centre of curvature C if the focal length of a convex mirror is 5 cm. Also, comment on the characteristics of the image if an object is placed 15 cm from the mirror. [5]
9. (a) Two lenses A and B have a power of +3 D and -4 D, respectively. What is the nature and focal length of each lens?

- (b) A combination of lens contains two converging lens of focal length 30 cm and 50 cm and a diverging lens of focal length 40 cm. Find the power and focal length of the combination. [5]

Chapter 11: Human Eye and the Colourful World

1. What is the far point and near point of the human eye with normal vision? [1]
2. What is the power of accommodation of the human eye? [1]
3. What is Tyndall effect? Explain with an example. [3]
4. Why does the sky appear blue during the day and red at sunset? [3]
5. Explain myopia, hypermetropia and their corrective measures in detail. [5]
6. An eye has a far point of 1.5 m. What type of lens would be required to increase the far point to infinity? Calculate the power of the lens, determine the defect of vision and describe the nature of the lens used to correct vision. [5]
7. With a neat and labelled diagram, explain the functioning of all the parts of the human eye. [5]
8. Draw and explain the dispersion of white light through a prism. Also, comment on the deviation, wavelength, frequency and speed of the dispersed light. [5]
9. Write a short note on the formation of a rainbow with a neat and labelled diagram. [5]

Chapter 12: Electricity

1. Define electric power and state its SI units. [1]
2. What are the factors on which the heating effect of electric current depend? Explain with a practical example. [3]

3. State and explain Ohm's law with a graph. [3]
4. What is resistivity? State the factors on which it depends. [3]
5. Resistors of $8\ \Omega$ and $12\ \Omega$ are connected in parallel to each other, while a resistor of $6\ \Omega$ is connected in series to a 6-V battery. Calculate: [5]
- (a) Total resistance of the circuit
 - (b) Total current in the circuit
 - (c) Total potential difference across the $6\text{-}\Omega$ resistor
- Draw a neat and labelled circuit diagram for the same.
6. An electric iron draws 2.4 amperes of current from a 240-V source. [3]
- Find
- (a) Resistance of the electric iron
 - (b) Power consumed by the electric iron
7. Give reasons for the following: [5]
- (i) Filament-type electric bulbs are not power efficient.
 - (ii) Coils of heating devices are made of alloys rather than pure metals such as copper.
 - (iii) An electric bulb is not filled with normal atmospheric air but is filled with argon or nitrogen.
 - (iv) Metals such as copper and aluminium are used on a large scale for the transmission of electricity.
 - (v) Parallel combination is preferred over series combination for connecting electric appliances in houses.
8. [5]
- (i) Derive the expression for heat produced due to current (I) flowing for a time period (t) through a resistor (R) having a potential difference (v) across the terminals.
 - (ii) Name the relation. List all the variables along with their SI units.
 - (iii) How much heat will an instrument of 14 W produce in half an hour if it is connected to a battery of 70 V?

Chapter 13: Magnetic Effect of Electric Current

1. What is the effect on magnetic field strength produced at a point near a straight conductor if the electric current flowing through it increases? [1]
2. What were the observations made by Oersted in his experiment of current-carrying conductors? [1]
3. If a current-carrying conductor is kept in a magnetic field, it experiences a force. List the factors on which the direction of this force depends. [3]
4. Explain Fleming's right-hand rule and left-hand rule. [3]
5. What is a magnetic field? List characteristics of a magnetic field. If two magnetic field lines intersect at a point, what does that indicate? [3]
6. Define and explain the phenomenon of electromagnetic induction. [3]
7. A coil of insulated copper wire is connected to a galvanometer. What happens if a bar magnet is [3]
 - (a) Pushed into the coil
 - (b) Withdrawn from the hollow space of the coil
 - (c) Held stationary inside the coil
8. Explain with a neat sketch the working of a DC motor. [5]
9. i) Distinguish between AC and DC.
 - ii) What is the advantage of AC over DC?
 - iii) How can we convert an AC generator to a DC generator?
 - iv) Which current is required for appliances like radio and television? [5]

Chapter 14: Sources of Energy

1. Why are thermal power plants set up near coal or oil fields? [1]
2. List any two advantages of wind energy. [1]

3. What are the characteristics of an ideal fuel and a good source of energy? [3]
4. What is a hydroelectric power plant? List all its advantages and disadvantages.[3]
5. List three advantages of using a solar cell. [3]
6. What are 'hotspots'? State the merits and demerits of the technique involving energy production from hotspots. [3]
7. Differentiate between nuclear fusion and nuclear fission. [5]
8. With a neat and labelled diagram, explain the construction and working mechanism of a biogas plant. [5]

Chapter 15: Our Environment

1. Why should biodegradable and non-biodegradable wastes be discarded in two separate dustbins? [1]
2. In the following food chain, 20,000 J of energy was available to plants. How much energy would be available to man in this chain? [1]
Plants → Sheep → Man
3. You being an environmentalist are interested in contributing towards the conservation of natural resources. List two activities that you can do on your own. [1]
4. What are the adverse effects of combustion of fossil fuels on the environment? List any two steps you would suggest to minimise environmental pollution caused by burning of fossil fuels. [3]
5. How is ozone formed in the upper atmosphere? Why is damage to the ozone layer a cause of concern to us? What causes this damage? [3]

6. Explain the phenomenon of 'biological magnification'. How does it affect organisms belonging to different trophic levels, particularly the tertiary consumers? [3]
7. What is a food chain? Why is the flow of energy in an ecosystem unidirectional? Explain briefly. [3]
8. [3]
 - (a) Why should national parks be allowed to remain in their pristine form?
 - (b) Why is the reuse of materials better than recycling?
9. Explain some harmful effects of agricultural practices on the environment. [5]

Chapter 16: Management of Natural Resources

1. State an instance where human intervention saved forests from destruction. [1]
2. List any two traditional systems of water harvesting. [1]
3. Why should coal and petroleum be used judiciously? [1]
4. Why must we conserve our forests? List any two causes for deforestation to take place. [3]
5. How do advantages of exploiting natural resources with short-term aims differ from the advantages of managing our resources with a long-term perspective? [3]
6. What is meant by sustainable management? Environmentalists insist on 'sustainable natural resource management'. State its four advantages. [3]
7. What is a dam? Why do we seek to build large dams? Mention the three main problems which should be addressed to maintain peace among local people while building large dams. [3]

8. Mention the environmental consequences of the increasing demand for energy. List four steps you would suggest to reduce the consumption of energy. [3]

9. [3]

(a) Write any two ways on how to save water to create awareness in your neighbourhood.

(b) Name and explain any one way by which the groundwater table does not go down further.