केंद्रीय विद्यालय संगठन क्षेत्रीय कार्यालय रायपुर

Kendriya Vidyalaya Sangathan Regional Office Raipur

Class - X

Multiple Choice Question Bank [MCQ] Term – I

Science [086]

Based on Latest CBSE Exam Pattern
for the Session 2021-22

केंद्रीय विद्यालय संगठन क्षेत्रीय कार्यालय रायपुर

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MESSAGE FROM DUPUTY COMMISSIONER

It is a matter of great pleasure for me to publish study material for different subjects of classes X and XII for Raipur Region. Getting acquainted and familiarized with the recent changes in curriculum and assessment process made by CBSE vide Circular No. 51 and 53 issued in the month of July 2021 will help students to prepare themselves better for the examination. Sound and deeper knowledge of the Units and Chapters is must for grasping the concepts, understanding the questions. Study materials help in making suitable and effective notes for quick revision just before the examination.

Due to the unprecedented circumstances of COVID-19 pandemic the students and the teachers are getting very limited opportunity to interact face to face in the classes. In such a situation the supervised and especially prepared value points will help the students to develop their understanding and analytical skills together. The students will be benefitted immensely after going through the question bank and practice papers. The study materials will build a special bond and act as connecting link between the teachers and the students as both can undertake a guided and experiential learning simultaneously. It will help the students develop the habit of exploring and analyzing the ***Creative & Critical Thinking Skills***. The new concepts introduced in the question pattern related to case study, reasoning and ascertain will empower the students to take independent decision on different situational problems. The different study materials are designed in such a manner to help the students in their self-learning pace. It emphasizes the great pedagogical dictum that *'everything can be learnt but nothing can be taught'*. The self-motivated learning as well as supervised classes will together help them achieve the new academic heights.

I would like to extend my sincere gratitude to all the principals and the teachers who have relentlessly striven for completion of the project of preparing study materials for all the subjects. Their enormous contribution in making this project successful is praiseworthy.

Happy learning and best of luck!

Vinod Kumar
(Deputy Commissioner)

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Kendriya Vidyalaya Sangathan Regional Office Raipur

Our Patorn

Vinod Kumar
Deputy Commissioner
KVS RO Raipur

Smt.Biraja Mishra
Assistant Commissioner
KVS RO Raipur

Sh.A.K. Mishra
Assistant Commissioner
KVS RO Raipur

Shri N.K.Sinha
Principal, Kendriya Vidyalaya Ambikapur

OUR TEAM

CONTENT DEVELOPMENT

R.P GUPTA ,PGT PHYSICS KV AMBIKAPUR MONIKA SHARMA, TGT SCIENCE,KV KHAIRAGARH

VINAY KUMAR,TGT SCIENCE,KV JAGDALPUR JUHI CHAKRABORTY,TGT SCIENCE,KV BILASPUR SARITA PAIKRA,TGT SCIENCE,KV KUSMUNDA SATYA VRAT SHARMA,TGT SCIENCE,KV BAIKUNTHPUR

DESINGNING,EDITING & EFFECTS SHEELA TOPPO, PGT BIOLOGY, KV AMBIKAPUR SWETA BAJPAI, PGT CHEMISTRY, KV AMBIKAPUR

COURSE STRUCTURE CLASS X

EVALUATION SCHEME		
THEORY		
Units	Term -I	Marks
I	Chemical Substances-Nature and Behaviour: Chapter 1,2 and 3	16
II	World of Living: Chapter 6	10
III	Natural Phenomena: Chapter 10 and 11	14
Units	Term -II	Marks
	Chemical Substances-Nature and Behaviour: Chapter 4 and 5	10
	World of Living: Chapter 8 and 9	13
	Effects of Current: Chapter 12 and 13	12
	Natural Resources: Chapter 15	5
Total Theory (Term I+II)		80
Internal Assessment: Term I		10
Internal Assessment: Term II		10
Grand Total		100

Chemical Substances- Nature and Behavior

CH.1-CHEMICAL REACTIONS AND EQUATIONS

(A) Single Response Questions

Q1. Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is

(a) 1:1 (b) 2:1
(c) 4:1 (d) 1:2

Q2. Which among the following is (are) double displacement reaction(s)?
(t) $Pb + CuCl \rightarrow PbCl_2 + Cu$
(ii) $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$
(iii) $C + O2 \rightarrow CO2$
(iv) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

(a) (i) and(iv)
(b) (ii) only
(c) (i) and(ii)
(d) (iii) and(iv)

Q3 Which option denotes a double displacement reaction?

(a) A + B + C
(b) A + B → C
(c) AC + BD → AD + BC
(d) AC + B → AB + C

Q4 Which of the following is correct balanced equation:-

a) $Fe + H_2O \rightarrow Fe_3O_4 + H_2\uparrow$

b) $2Fe+4H_2O \rightarrow Fe_3O_4+4H_2\uparrow$

c) $3Fe+4H_2O \rightarrow Fe_3O_4+4H_2\uparrow$

d) $3Fe+ H_2O \rightarrow Fe_3O_4+ H_2\uparrow$

Q5. A reaction in which a single product is formed from two or more reactants is known as a .....reaction.

a) combination b) double displacement

c) decomposition reaction d) displacement reaction Q6.

What is chemical formula for marble?

a) CaO b) $Ca(OH)_2$ c) $CaCO_3$ d) $CaCl_2$

Q7. What is the chemical formula for quick lime?

a) CaO b) $Ca(OH)_2$ c) $CaCO_3$ d) $CaCl_2$

Q8. 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.

Q9.Thefollowingreactionisanexampleofa

$4NH_3(g)+5O_2(g)\rightarrow 4NO(g)+6H_2O(g)$

(i)displacementreaction (ii) combinationreaction

(iii)redoxreaction (iv) neutralisationreaction

a) (i) and (iv)
(b) (ii) and(iii)
(c) (i) and(iii)
(d) (iii) and(iv

Q10. Which of the following reactions is not correct:

(a) $Zn + CuSO4 \rightarrow ZnSO4 + Cu$
(b) $2Ag + Cu(NO3)2 \rightarrow 2AgNO3 + Cu$
(c) $Fe + CuSO4 \rightarrow FeSO4 + Cu$
(d) $Mg + 2HCl \rightarrow MgCl2 + H2$

Q11.Ifasubstancelosesoxygenorgainshydrogenduringareactionitissaidtobe……

a)Oxidised b)Reduced c)tarnished d) corroded

Q12. Some metals tarnished by substances around them such as moisture when left for some time what is this process called as?

a)Corrosion b) Rancidity

c)Galvanization d) Reduction

Q13. Respiration is a /an:

a) endothermic reaction

b) exothermic reaction

c) decomposition reaction

d) displacement reaction

Q14. Keeping food in airtight containers helps to slow down:

a) reduction

b) displacement

c) oxidation

d) all of the above

Q15.Whenasinglereactantbreaksdowntogivesimplerproductsthereactionisknownas:

a) endothermic reaction

b) exothermic reaction

c)decomposition reaction

d) oxidation reaction

(B) Multiple Response Questions

Q1. Which among the following is an exothermic reaction?

a) respiration

b) decomposition ofvegetables

c) burning of natural gas

d) decomposition of silver chloride

Q2 Identify combination reactions given below:

a) heating of ferrous sulphate

b) reaction of quick lime with water

c) burning of coal

d) formation of water from hydrogen and oxygen

Q3 Which among the following is/are chemical reactions?

a) souring of milk

b) cutting of wood

c) cooking of food

d) burning

Q4 Identify endothermic reactions given below:

a) respiration

b) photosynthesis

c) melting of ice cube

d) reaction of silver bromide in sunlight. Q5

How can we prevent rancidity?

a) Adding antioxidants

b) Storing food in airtight containers

c) Replacing oxygen in the containers with another gas.

d) Its not possible to prevent rancidity.

(C) Assertion- Reason questions

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true 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.

Q1 Assertion (A): Calcium hydroxide when reacts with carbon dioxide gives calcium carbonate and water.

Reason (R) : On heating calcium carbonate, decomposition reaction takes place.

Q2 Assertion (A): Decomposition of vegetable matter into compost is an example of exothermic reactions.

Reason (R) : Exothermic reaction are those reactions in which heat is absorbed.

Q3 Assertion (A) : Green fumes are produced when lead nitrate is heated.

Reason (R) : Nitrogen dioxide gas is produced as a by product due to the decomposition of lead nitrate.

Q4 Assertion(A): When copper powder heated it becomes black in colour .

Reason(R): Copper oxide is produced due to oxidation which is black in colour.

Q5 Assertion (A):Chipsmanufacturersusuallyflushbagsofchipswithgassuchasnitrogento prevent the chips from getting oxidised.

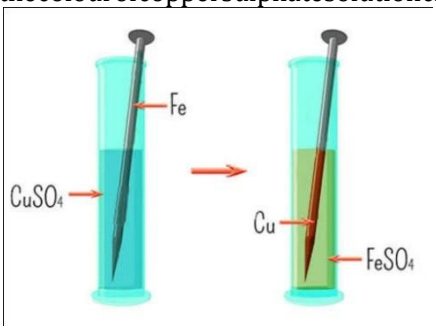
Reason (R): Nitrogen being antioxidant prevents the chips from being oxidised.

(D) CCT Questions

Q1 

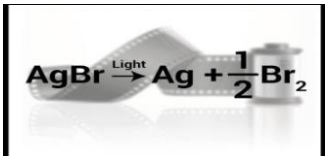
A student has been collecting antique silver utensils for her research. One day she observed a black coatingonsilver utensils.Whichchemicalphenomenonisresponsibleforthischange?Writethe chemical name of black coating.

Q2 Whenaniron nailisdippedincoppersulphatesolution,abrowncoatingofcopperisformedonthe surfaceofironand thecolourofcoppersulphatesolutionchangesfrombluetolightgreen.



Whydoesthecolourofcopper sulphatechangewhenaniron nailiskeptinit?Justifyyouranswer.

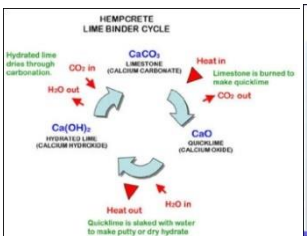
Q3 Adarkroomisusedtoprocessphotographicfilm,tomakeprintsandtocarryoutother associatedtasks.Itisa roomthatcanbemadecompletelydarktoallowtheprocessingofthelight- sensitive photographic materials, including film and photographic paper. Silver bromide is a light- sensitivecompoundthatisitgetsdecomposedwhenexposed tolight.Sowhensilverbromideis exposedtosunlight,itgetsdecomposedtogivesilvermetalandbromine gasis liberated.The reaction is called a photolysis reaction.

a. Duringdecompositionreactions.....isrequired. 

b. Reactionsinwhichenergyisabsorbedareknownas... .....reactions

Q4 Rashiwhitewashedherhome.Sheusedawhitepowderforwhitewashing. Itproducescalcium hydroxide($CaOH)_2$ whenitreactswithwater(H_2O)andabsorbscarbondioxide(CO_2)fromthe

environment, as a result, it produces calcium carbonate ($CaCO_3$) which creates a hard coating on the walls and after 2-3 days the walls start shining.



a) Which is slaked lime in above reaction?

b) Why is slaked lime is used for white washing?

c) A solution of a substance X is used for white washing. (1) Name the substance X and write its formula. (2) Write the reaction of the substance X named in (1) above with water.

d) Why walls start shining after 2-3 days?

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Answer-Key CH. 1-CHEMICAL REACTIONS AND EQUATIONS

(A) Single Response Questions

1. b (2 Hydrogen and 1 oxygen) 2. B (Both reactants undergo displacement) 3. C 4. c 5. A 6. C 7. A 8. b (White precipitate of silver iodide is formed) 9. C (Displacement and Redox reaction) 10. a (Apply rule for balancing chemical equation) 11. B (Reduction is loss of Oxygen or gain of Hydrogen)

12. **a** (It is a slow process) 13. Ans b - Exothermic reaction

14. Ans c – oxidation 15. Ans c – decomposition reaction

(B) Multiple Response Questions:

1. Ans 1 - options (a) (b) and (c)

Explanation: In exothermic reaction heat/energy is resleased

2. **Ans2** -Options (b), (c) and (d)

Explanation: In combination reaction two or more reactants combine to form a product.

3. Ans 3 – Options (a), (c) and (d)

Explanation: Chemical changes occur in chemical reactions.

4. Ans 4-Options (b), (c) and (d)

Explanation: In endothermic reaction energy is absorbed.

5. Ans5 - Options (a), (b) and (c)

Explanation: Rancidity can be prevented by slowing down oxidation of food containing fats and oils. **(C) Assertion-**

Reason questions

1. b

2.c

3. d

4. a

5.a

(D) CCT Questions

Ans1.The phenomenon is called corrosion (oxidation). Blackcoating

onsilverutensilsissilversulphide.

2 Ag(s) + H2S(g) ---> Ag2S(s) + H2(g)

silver sulphide

Ans2.Whenaironnailimmersedinthesolutionofcoppersulphatethanirondisplacescopperfrom the solution of copper sulphate because iron is more reactive than copper. Therefore copper sulphate solution colour changes from blue to pale green.

Reaction: $CuSO4(aq)+Fe(s)\rightarrow FeSO4(aq)+Cu(s)$ Ans3.

a) energy b) endothermic

Ans4. a) $Ca(OH)_2$ calcium hydroxide

b) White-wash is especially compatible with masonry because it is absorbed easily and the resultant chemical reaction hardens the medium.

c)(1)The solution of the substance used for whitewashing is calcium oxide also called quicklime with chemical formula CaO.

(2) Itformsslackedlimeorcalciumhydroxidewhenthequicklimereactswithwater $CaO(s) + H2O(l) \rightarrow Ca(OH)_2(aq)$.

d)Quicklime is used for whitewashing as it produces calcium hydroxide (CaOH) when it reacts with water (H2O) and absorbs carbon dioxide (CO2) from the environment, as a result, it produces calcium carbonate (CaCO3) which creates a hard coating on the walls. Walls start shining due to the formation of calcium carbonate.

CH.2-Acid,Bases and Salts

Section-A (Multiple choice Questions)

1. Plaster of pairs is prepared from-

(a) limestone (b) Slaked lime (c) quicklime (d) gypsum

2. A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains

(a) NaCl (b) HCl (c) LiCl (d) KCl

3. Antacids contain-

(a) weak base (b) weak acid (c) strong base (d) strong acid

4. The correct statement regarding universal indicator is

(a) it is an indicator having pH =7 (b) it gives blue colour at pH =3

(c) it becomes colourless at pH =7 (d) it gives orange colour at pH =3

5. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?

(a) Baking Powder (b) Lime (c) Ammonium Hydroxide Solution (d) hydrochloric Acid

6. The organic acid present in tomato is:

(a) oxalic acid (b) lactic acid (c) malic acid (d) tartaric acid

7. Bleaching powder gives smell of chlorine because it-

(a) is unstable (b) gives chlorine on exposure to atmosphere

(c) is a mixture of chlorine and slaked lime (d) contains excess of chlorine

8. The reaction of metal with acid results in the formation of-

(a) only hydrogen gas (b) only salt (c) both salt and hydrogen gas (d) none of these

9. In one of the industrial processes used for manufacture of sodium hydroxide, a gas *X* is formed as by-product. The gas *X* reacts with lime water to give a compound *Y* which is used as a bleaching agent in chemical industry. The compound *X* and *Y* could be:

(a) H_2 and $NaHCO_3$ respectively (b) CO_2 and $CaOCl_2$ respectively

(c) Cl_2 and $CaOCl_2$ respectively (d) Cl_2 and $NaHCO_3$ respectively

10. Chemical formula of baking soda is:-

(a) $MgSO_4$ (b) Na_2CO_3 (c) $NaHCO_3$ (d) $MgCO_3$

11. The acid used in making of vinegar is-

(a) formic acid (b) acetic acid (c) sulphuric acid (d) nitric acid

12. Acetic acid was added to a solid *X* kept in a test tube. A colourless and odourless gas was evolved. The gas was passed through lime water which turned milky. It was concluded that.

(a) Solid *X* is sodium hydroxide and the gas evolved is CO_2

(b) Solid *X* is sodium bicarbonate and the gas evolved is CO_2

(c) Solid *X* is sodium acetate and the gas evolved is CO_2

(d) Solid *X* is sodium chloride and the gas evolved is CO_2

13. Which of the following acid is present in sour milk?

(a) glycolic acid (b) lactic acid (c) citrus acid (d) tartaric acid

14. is the fixed number of water molecules chemically attached to each formula unit of a salt in its crystalline form.

(a) water of crystallisation (b) water content (c) hydration (d) none

15. When an acid reacts with a metal carbonate or metal hydrogen carbonate, it gives the corresponding salt, water and releases which gas :-

(a) O_2 (b) CO_2 (c) H_2 (d) N_2

Section -B-(MCQ with Multiple Correct answers)

15. Which of the following is used for dissolution of Gold?

(a) HCl (b) Nitric Acid (c) Sulphuric Acid (d) Carbonic Acid

16. Which of the following are alkali:-

(a) NaOH (b) $Ca(OH)_2$ (c) CuO (d) HCl

17. Which of the following is not formed as a product of Chlor-Alkali process:-

(a) HCl (b) HF (c) Cl_2 (d) NaOH

18. Which of the following is/are acidic in nature?

(a) Apple Juice (b) Soap Solution (c) Lemon Juice (d) Caustic Soda

19. Which of the following is taken orally as medicine in the case of hyperacidity to get relief?

a. Milk of magnesia
b. NaOH
c. HCl
d. Eno

Section-C (Assertion and Reason type)

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.

(e) Both Assertion and Reason are false.

20. **Assertion :** Phenolphthalein gives pink colour in basic solution.

Reason : Phenolphthalein is a natural indicator.

21. **Assertion :** H_2CO_3 is a strong acid.

Reason : A strong acid dissociates completely or almost completely in water.

22. **Assertion :** When common salt is kept open, it absorbs moisture from the air.

Reason : Common salt contains magnesium chloride.

23. **Assertion :** Baking soda creates acidity in the stomach.

Reason : Baking soda is alkaline.

24. **Assertion :** While dissolving an acid or base in water, the acids must always be added slowly to water with constant stirring.

Reason : Dissolving an acid on a base in water in highly exothermic reaction.

Section-D (CCT Questions)

25. Following are the observations of an experiment on conduction of electricity by acids:

S.No.	Sample Solution	Observation	Inference
1	Hydrochloric Acid	Bulb Glows	Conducts Electricity
2	Sulphuric Acid	Bulb Glows	Conducts Electricity
3	Glucose Solution	Bulb does not glow	No conduction
4	Alcohol Solution	Bulb does not glow	No conduction

This shows that acidic solution conducts electricity while glucose and alcohol solutions do not conduct electricity.
(a) What makes acids conducting in nature?
(b) Why do glucose and alcohol solutions do not conduct electricity?
(c) can all substances containing hydrogen be called acids?
(d) Write an equation that shows the ionisation of H_2SO_4 in aqueous solution.

26. Our body works within the pH range of 7.0 to 7.8. Living organisms can survive only in a narrow range of pH change. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows into the rivers, it lowers the pH of the river water. The survival of aquatic life in such rivers becomes difficult.

(a) At what pH human body normally works?
(b) When does Rain water becomes acidic?
(c) why does life of aquatic animals becomes difficult?

27. It is very interesting to note that our stomach produces hydrochloric acid. It helps in the digestion of food without harming the stomach. During indigestion the stomach produces too much acid and this causes pain and irritation. To get rid of this pain, people use bases called antacids. These antacids neutralise the excess acid. Magnesium hydroxide (Milk of magnesia), a mild base, is often used for this purpose.

(a) why Antacids are used?
(b) name any one antacid along with its chemical formula?
(c) Name the chemical reaction which happens when stomach acid reacts with milk of magnesia?

28. Acid and Bases are encountered daily in chemistry and our everyday life. Both acids and Bases are the part and parcel of our livelihood. They play an efficient role inside or outside of our body. From the formation of food to the decomposition of any substance, acid and bases play a crucial role in our everyday life.

(a) Give the name of a common acid that is used in everyday life. (b) Give an example of a basic substance used in everyday life.
(c) Which acid is secreted in our stomach along with gastric juices?
(d) Name one natural indicator that help us to detect the acidic or basic nature of any substance.

Answer Key - CH.2- Acid, Bases and Salts

1. (d) It contains Calcium sulphate
2. (b) CO_2 gas is evolved
3. (a) Neutralisation reaction
4. (d) It can detect both acid and base
5. (d) hydrochloric Acid
6. (a) oxalic acid
7. (b) gives chlorine on exposure to atmosphere
8. (c) both salt and hydrogen gas
9. (c), The gas released during the manufacture of sodium hydroxide is chlorine, $Cl_2(X)$.
   $Cl_2(X)$ when reacts with lime water (Y), a compound called bleaching powder, $CaOCl_2$ is obtained.
10. (c) sodium Bicarbonate
11. (b) acetic acid
12. (b) sodium bicarbonate and the gas evolved is CO_2
13. (b) Lactic Acid
14. A) Water of Crystallisation
15. B) Carbon dioxide
16. (a)&(b) Explanation: Aquaregia is a mixture of nitric acid (HNO3) and hydrochloric acid (HCl) in a molar ratio 1:3, it can dissolve noble metals like gold & platinum.
17. (a)&(b) Explanation: Alkalies are strong bases that turns red litmus to blue, they react with acids to give neutral salts, corrosive in nature.
18. (c)&(d) Explanation: Reaction of chlor-alkali process is- $NaCl(aq.) + 2H2O(l) \rightarrow 2NaOH(aq.) + Cl_2(g) + H_2(g)$
19. (a)&(c) Explanation: Acids are sour in taste, have pH value less than 7.
20. (a)&(d) Explanation: Antacids are basic in nature, they neutralizes the effects of acids.
21. (c) sodium Bicarbonate
22. (d)
23. (a)
24. (d)
25. (a)
26. (a) Acids ionize in water to form hydrogen ions and corresponding anions which make acidic solutions conducting in nature.
    (b) Glucose and alcohol do not ionise in water. Hence, these solutions do not conduct electricity.
    (c) All compounds containing hydrogen do not ionise to give H^+ ions and hence are not acids. (d) $H_2SO_{4(aq)} \rightarrow 2H^+_{(aq)} + SO_4^{2-}{}_{(aq)}$
27. (a) 7.0-7.8
    (b) When pH goes below 5.5
    (c) Due to fall in pH life of aquatics animals becomes difficult.
28. (a) To reduce the acidity of stomach
    (b) Milk of Magnesia, $Mg(OH)_2$
    (c) Neutralisation reaction.
29. (a) Acetic Acid in form of Vinegar
    (b) Baking Soda
    (c) Hydrochloric Acid
    (d) Litmus

CH.3-METALS AND NON - METALS

Section-A (Multiple choice Questions)

Q. Choose the one correct option from the following -

1. Which of the following is the correct arrange-ment of the given metals in ascending order of their reactivity?
   Zinc, Iron, Magnesium, Sodium
   (a) Zinc > Iron > Magnesium > Sodium
   (b) Sodium > Magnesium > Iron > Zinc
   (c) Sodium > Zinc > Magnesium > Iron
   (d) Sodium > Magnesium > Zinc > Iron
2. An element X is soft and can be cut with a knife. This is very reactive to air and cannot be kept open in air. It reacts vigorously with water. Identify the element from the following
   (a) Mg (b) Na
   (c) P (d) Ca
3. Reaction between X and Y forms compound Z and X lose selectron and Y gain selectron. Which of the following properties is Not shown by Z?
   (a) Has high melting point
   (b) Insoluble in water
   (c) Conducts electricity in molten state
   (d) Occurs as solid
4. What happens when dilute sulphuric acid is poured on silver plate:-
   (a) Silver sulphate is formed
   (b) SO2 gas is evolved
   (c) No reaction takes place
   (d) Hydrogen gas is evolved
5. Chemical formula of rust is:-
   (a) Fe_2O_3 (b)) $Fe_2O_3.x\,H2O$
   (c) FeO (d) Fe_3O_4
6. A metal which is exists in liquid state at room temperature.
   a) Na b) Ag c) Hg d) Au
7. The electronic configuration of three elements X, Y and Z are as follows:
   X=2,4, Y=2,8,1, Z=2,8,7 two elements will combine to form anionic compound and the correct formula is:-
   (a) X_2Y (b) YZ
   (c) XZ_3 (d) Y_2Z
8. Nature of metal oxides are:
   a) acidic b) basic c) amphoteric d) neutral
9. The colour of aqueous solution of zinc sulphate as observed in the laboratory is:
   a) Green b) Yellow c) Blue d) Colourless

10. Which of the following are not ionic compounds?
(i) KCl (ii) HCl
(iii) CCl_4 (iv) NaCl
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iii)

SECTION-B (MULTIPLE RESPONSE QUESTIONS) –

Q. Select the correct options form the choices given below in each question –

1. Which of the following are most malleable metals –

a) Sodium b) calcium c) gold d) silver

2. Which of the following pair will show displacement reaction?

i) $CuSO_4$ solution and Iron metal

ii) $MgCl_2$ solution and aluminum metal

iii) $FeSO_4$ solution and silver metal

iv) $AgNO_3$ solution and copper metal.

3. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:

(a) calcium

(b) carbon

(c) silicon

(d) Magnesium

SECTION-C (ASSERTION –REASONING QUESTIONS) -

Q, From question numbers 1 to 3 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) and (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.

1. **A** : Ionic compounds have high melting and boiling points.
   R: A large amount of energy is required to break the strong inter-ionic attraction in ionic compounds.
2. **A :** Gold, Silver, Platinum are metals which are used for making jewelleries
   R : Gold , silver , Platinum are very expensive metals.
3. **A :** Iron nails changes the colour of copper sulphate solution when kept dipped in it for 30 minutes.
   R : Copper being more reactive reacts with iron nails .

SECTION-D (CCT BASED QUESTIONS)–

1. Pihu was a student of class 7th, she was noticing from few days that her grandmother's new copper bottle was becoming dull due to formation of a green coloured coating on it, although it was cleaned everyday. She also observed these changes in other metallic objects like– metal statues, iron nails, iron articles etc. She was in deep thoughts and wanted to know what is reason behind this dull appearance of metals and do all metals show this property? Can this damaging of metal surface prevented ?

Answer the following questions reading the above paragraph –

a) What is this process called which makes surface of metals dull and faded ?

i) corrosion ii) reduction iii) electrolysis iv) combination

b) Write the reaction taking place during rusting of iron in form of equation.

Ans ……..

c) What is the green coloured coating that appeared on copper bottle ?

i) Copper carbonate ii) Copper chloride

iii) Basic Copper carbonate iv) Acidic Copper chloride

d) Metals can be protected from corrosion by –

i) Washing, cleaning ii) painting, galvanizing

iii) heating iv) None of the above

2. Metals can be arranged in a series of their reactivity, this series is called reactivity series. Metals at the top of the series are very reactive and therefore they do not occur free in nature. The metals at the bottom of the series are least reactive and therefore occur free in nature. Metals more reactive than hydrogen reacts with acids to give H_2, while metals less reactive than hydrogen do not react with acids to give H_2. Answer the following question observing the reactivity series given below.

METAL	SYMBOL
Potassium	K
Sodium	Na
Calcium	Ca
Magnesium	Mg
Aluminium	Al
Zinc	Zn
Iron	Fe
Lead	Pb
Hydrogen	**H**
Copper	Cu
Mercury	H
Silver	Ag
Platinum	Pt
Gold	Au

REACTIVITY SERIES

A) Least reactive metal is -

i) Sodium ii) Copper iii) Gold iv) Platinum

B) Complete the following equations –

i) Zn + HCl → ……

ii) Au + HCl → ……

C) A copper plate is dipped in silver nitrate solution, the result observed is – i) silver is displaced by copper ii) silver displaces copper

iii) no reaction takes place iv) nitric acid is formed

D) Sodium is stored in kerosene oil because – i) It is least reactive metal

ii) it is very reactive metal and explodes when comes in contact with air .

iii) it evaporates in open.

iv) none of the above.

ANSWER KEY

CH.3-METALS AND NON-METALS

SINGLE RESPONSE ANSWER –

Q. (1) d Take help of reactivity series

(2) b. Na

(3) b Insoluble in water

(4) c No reaction takes place it is dil. Acid

(5) b Rusting of Iron yields $Fe_2O_3.x H2O$

(6) c. Hg (Mercury)

(7) b Take example of Nacl

(8) b)Basic

(9) d Colour of ZinkSulphate

(10) b

Multiple Response-ANSWERS-

Q. 1) c and d

Explanation: Malleability is the property by which metals to be hammered into thin sheets without breaking.

2) i and iv

Explanation: A more reactive element can displaces a less reactive element from its salt solution or compound.

3) a and d

Explanation: Metals loose electrons while non metals accept electrons to form ionic bond.

ASSERTION AND REASONING BASED ANSWERS -

1.a) Both A and R are true, and R is correct explanation of the assertion.
2.b)BothAandRaretrue,butRisnotthecorrectexplanationoftheassertion. 3.c) A is true, but R is false.

CCT BASED QUESTION'S ANSWERS :

1. a) i.)Corrosion
   b) $2Fe + 3/2\, O_2 + x H_2O \rightarrow Fe_2O_3.xH_2O$ (hydrated ferric oxide)Rust.
   c) iii) Basic copper carbonate – $CuCO_3.Cu(OH)_2$
   d) ii) painting, galvanizing

2. a) i) Gold
   b) i)$Zn + HCl \rightarrow ZnCl_2 + H_2$ ii) $Au + HCl \rightarrow$ No Reaction
   c) i) silver is diplaced by copper (as copper is more reactive than silver)
   d) ii) sodium is very reactive metal and explodes when comes in contact with air (moisture)

LIFE PROCESSES

MCQ-SINGLE RESPONSES

1. In which of the following groups of organisms, food material is broken down outside the body and absorbed?

(a) Mushroom, green plants, Amoeba

(b) Yeast, mushroom, bread mould

(c) Paramecium, Amoeba, Cuscuta

(d) Cuscuta, lice, tapeworm

2. If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?

(a) Proteins breaking down into amino acids

(b) Starch breaking down into sugars

(c) Fats breaking down into fatty acids and glycerol

(d) Absorption of vitamins

3. A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains

(a) complex proteins

(b) simple proteins

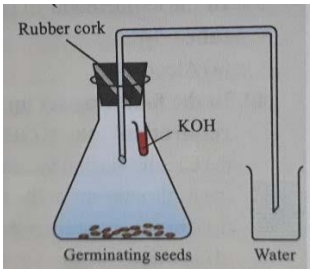
(c) fats

(d) starch

4. The procedure used for cleaning the blood of a person by separating urea from it is called:
(a) osmosis
(b) filtration
(c) dialysis
(d) double circulation

5. How is the circulations of blood in fish different from that in humans?
(a) The heart in fish is bigger in size.
(b) The flow of blood in fish is unidirectional.
(c) The blood goes through heart only once in fishes.
(d) The heart of fish has more chambers compared to that of a human.

6. In the experiment given here water will rise in the tube because


Rubber cork
KOH
Germinating seeds
Water

(a) Oxygen of air in the flask will be taken up by the germinating seeds

(b) Carbon dioxide given out by the germinating seeds will be absorbed by KOH.

(c) Carbon dioxide given out we'll go through the glass tube and push water up into the tube

(d) Moisture in the germinating seeds will reach the water in the beaker through the delivery tube.

The correct reason of water to rise in the tube is

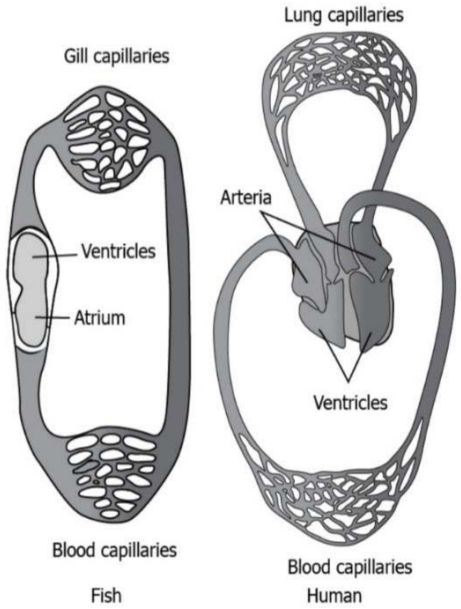
(i) (a)

(ii) (b)

(iii) (c)

(iv) (d)

7. The image shows the circulation of blood in fishes and human



How is the circulations of blood in fish different from that in humans?

(a) The heart in fish is bigger in size.

(b) The flow of blood in fish is unidirectional.

(c) The blood goes through heart only once in fishes.

(d) The heart of fish has more chambers compared to that of a human.

8. We test for starch and not glucose to prove that photosynthesis has taken place because:

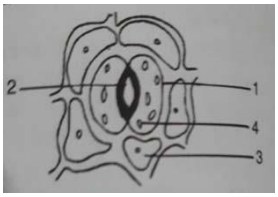
(a) Glucose is not produced during photosynthesis in variegated leaves

(b) Glucose formed during photosynthesis gets stored as sucrose

(c) Glucose formed during photosynthesis gets stored as starch

(d) Glucose is a stable product and cannot be tested

9. Given below is the figure of a stomata select the correct labelling for this diagram



(a) 1 epidermal cells, 2 stoma, 3 guard cell, 4 chloroplast

(b) 1 guard cell, 2stoma, 3 epidermal cells, 4 chloroplast

(c) 1 stoma, 2 epidermal cell, 3chloroplast, 4 guard cell

(d) 1 chloroplast, 2 stoma 3 epidermal cells 4 guard cell

MCQ WITH MULTIPLE RESPONSES

1. Which of the following statement(s) is (are) true about respiration?

(i) During inhalation, ribs move inward and diaphragm is raised

(ii) In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood and carbon dioxide from the blood into the alveolar air

(iii) Haemoglobin has a greater affinity for carbon dioxide than oxygen

(iv) Alveoli increase surface area for exchange of gases

(a) (i) and (iv)

(b) (ii) and (iii)

(c) (i) and (iii)

(d) (ii) and (iv)

2. Which of the following statement (s) is (are) true about the heart?

(i) The left atrium receives oxygenated blood from different parts of the body while the right atrium receives deoxygenated blood from lungs.

(ii) Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs.

(iii) Left atrium transfers oxygenated blood to the right ventricle which sends it to different body parts.

(iv) The right atrium receives deoxygenated blood from different parts of the body while the left ventricle pumps oxygenated blood to different parts of the body.

(a) (i)

(b) (ii)

(c) (ii) and (iv)

(d) (i) and (iii)

3. The role of nasal cavity in human respiratory system

(i) Filtration of inhaled air.

(ii) Removal of germs and dust.

(iii) Moistening of the inhaled air.

(a)(i) & (ii)

(b)(ii) & (iii)

(c)(i), (ii) & (iii)

(d) None of these

REASON AND ASSERTION

1. **Assertion**: Although bile juice has no digestive enzymes it is still considered to be very important during digestion of food

Reason: Bile provide alkaline medium and emulsifies fat.

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

2. **Assertion**:Herbivores have longer small intestine as compared to Carnivores

Reason: Food takes more time to digest in Carnivore

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

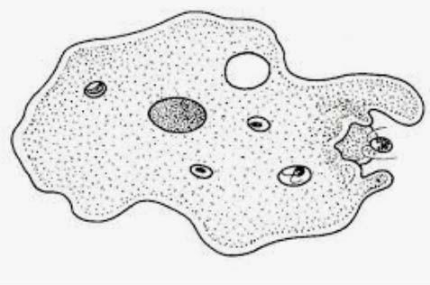
3. **Assertion**: Haemoglobin content is more in the children than the adult.

Reason: Children have higher metabolic rate and growth rate than the adults.

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

CCT-1

Amoeba is an animal having no fixed shape.It ingests food particles by formation of temporary finger-like projections. The food vacoule inside amoeba breaks down the food into small and soluble molecules.

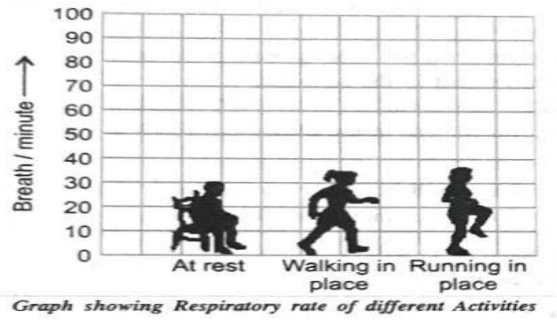


The digested food is thrownout by the amoeba by the rupture of cell membrane and it goes on for the search of next food particle.

Q1.Amoeba belongs to which group of microorganisms?
(1) Fungi
(2) Bacteria
(3) Protozoa(4) Virus
Q2. What are the temporary projections made in amoeba called?
(1) Walking legs
(2) Limbs
(3) Pseudopodia
(4)None of the above
Q3. What type of nutrition is followed by amoeba?
(1) Parasitic
(2) Holozoic
(3) Saphrotrophic
(4) Autotrophic
Q4. The process of throwing out of undigested food in Amoeba is called
(1) Egestion
(2) Digestion
(3) Nutrition
(4) None of the above
Q5. Give an example of organism which follows same mode of nutrition in amoeba.
(1) Vertebrates
(2) Fungi
(3) Tapeworms
(4) Cuscuta plants

CCT-2 ITEM

RESPIRATION



Graph showing Respiratory rate of different Activities

Most living things need oxygen to obtain energy from food. The oxygen reacts with food molecules and that is how energy is obtained which is stored in the form of ATP molecules in the cells. This energy can be used anywhere the bodywants to do so. The process of releasing energy from food is called respiration.

Q1. What is the full form of ATP?
(1) Adenisyne tri-phosphate
(2) Adenosine tri-phosphate
(3) Adenosine tetraphosphate
(4) Adenosine monophosphate
Q2. Respiration is
(1) Catabolic process
(2) Anabolic process
(3) Physical process
(4) Biophysical process
Q3. Respiration is the process in which-
(1) Energy is released and stored in the form of ATP
(2) Energy is stored in the form of ADP
(3) Energy is not released at all
(4) Energy is used up
Q4. The form of energy used in respiration is -
(1) Electrical energy
(2) Chemical energy
(3) Mechanical energy
(4) Radiant energy
Q5. How many types of respiration are there?
(1) 1
(2) 3
(3) 2
(4) None of the above

Answer

1. The answer is (b) Yeast, mushroom, bread mould

Explanation:

Yeast, mushroom and bread mould are saprophytes and Saprophytes break the food material outside their body and absorbed.

2. The answer is (b) Starch breaking down into sugars

Explanation: Salivary Amylase enzyme present in the saliva breaks down Starch into simpler sugar and helps in digesting them. Hence the breakdown of starch will be affected if salivary amylase is lacking in the saliva.

3. The answer is (d) starch

Explanation: Starch is made up of two components Amylose and Amylopectin. When we add iodine to starch-containing water Amylose reacts with iodine to form a blue colour complex. Here solution gives blue-black colour on adding Iodine which confirms the presence of starch in the rice water.

4. (c) Dialysis

Explanation: Dialysis is a procedure to remove waste products and excess fluid from the blood when the kidneys stop working properly.

5. Correct Answer: Option (c)

6. Correct Answer: Option (b)

7. Correct Answer: Option (c)

8. Correct Answer: Option (c)

9. Correct Answer: Option (b)

MULTIPLE RESPONSES

1. The answer is (d) (ii) and (iv)

Explanation: Statement i) is wrong because ribs move outward and the diaphragm is lowered during inhalation. Similarly Option iii) is wrong because Haemoglobin has greater affinity for oxygen than CO_2.

2. The answer is (c) (ii) and (iv)

Explanation: Oxygenated blood circulates through the left part of the heart whereas deoxygenated blood circulates through the right part of the heart. Atrium receives blood and ventricle pumps the blood out of the heart.

3. The answer is (c)(i), (ii) & (iii)

REASON AND ASSERTION

1. (a)

2. (c)

3.(a)

CCT 1

Q1. (1) Protozoa

Q2. (3) Pseudopodia

Q3. (2) Holozoic

Q4. (1) Egestion

Q5. (1) Vertebrates

CCT 2

Solution

Q1. (2) Adenosine tri-phosphate

Q2. (1) Catabolic process

Q3. (1) Energy is released and stored in the form of ATP

Q4. (2) Chemical energy

Q5. (3) 2

Topic: Light- Reflection and Refraction

MCQ (Single response questions)

Q1. What is the radius of curvature of a plane mirror?

(a) Dependonsizeofmirror (b)zero

(c)Infinity (d)Dependuponthedistanceofobjectfrommirror Q2.An

incidentrayfallsnormallyonaglassslab,whatistheangleofrefraction?

(a)90^0 (b) 45^0 (c) 25^0 (d) 0^0

Q3.Thefocallengthofasmallconcavemirroris2.5cm.inordertousethisconcavemirrorasa dentist's, the distance of tooth from the mirror should be

(a)5.5cm (b)4.5cm (c)3.5cm (d) 1.5cm

Q4.Thespeedoflightinatransparentmediumis0.6timesasthatofitsspeedinvacuum.Whatisthe refractive index of the medium?

(a)1.0 (b)1.33 (c)1.55 (d)1.66

Q5. Does refractive index vary with colour of light?

(a) yes (b) no (c)sometime (d) depend on the colour of light

Q6.Whatshouldbethepositionoftheobject,whenaconcavemirroristobeusedintorches producing parallel beam of light?

(a)atC (b)betweenCandF (c)atF (d) between F and P

Q7.Nomatterhowfaryoustandfromamirror,your Imageappearserect.Themirrorislikelytobe

(a)plane (b)concave (c)convex (d)Eitherplaneorconvex Q8.

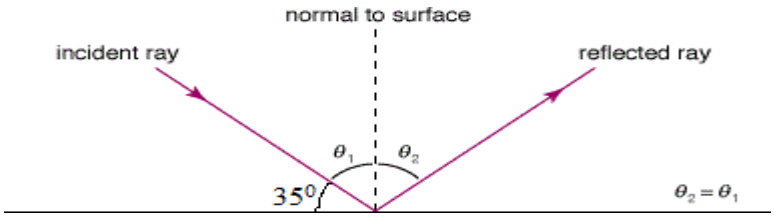
Magnification produced by a rear-view mirror fitted in vehicles is

(a) 0 (b) 1 (c) lessthanone (d) more than one

Q9. You are given water, mustard oil, glycerine and kerosene. In which of these media a ray of light incident obliquely at same angle would bend the most?

(a) water (b)mustardoil (c) glycerine (d)kerosene

Q10. Find the angle of incidence and the angle of reflection from the diagram



(a)55^0, 45^0 (b) 45^0, 55^0 (c) 55^0, 55^0 (d) 45^0, 45^0

Q11.Anobjectisplacedbeforeasphericalmirror.Theimageisfoundtobevirtualforallthe positions of the

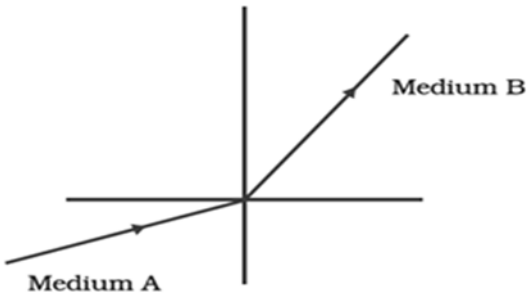
object. Name the spherical mirror.

(a) Plane (b) convex (c) concave (d) both (b) and (c)

Q12. sin i / sin r = constant, is called…

(a) law of reflection (b) Snell's law (c) ohm's law (d) none of these

Q13. A light ray enters from medium A to medium B as shown in the figure. The refractive index of medium B relative to A will be



(a) Greater than unity (b) less than unity (c) equal to unity (d) zero

Q14. A convex lens produces a magnification of +5. Where the object should be placed?

(a) At 2f (b) between 2f and f (c) at f (d) at less than f

Q15. A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find its magnification.

(a) 1 (b) 2 (c) -1 (d) -2

MCQ (Multiple Response Type)

Q1. We can get real and highly diminished or diminished size of image by convex lens in the following conditions when object is placed at-

(i) Infinity (ii) beyond 2F1

(iii) At F1 (iv) Between F1 and O

Choose the correct option

(a) (i) and (ii) (b) (i) and (iii)

(c) (i) and (iv) (d) (ii) and (iv)

Q2. There are certain rules for the image formation in spherical mirror. Which of the following are applicable in convex mirror?

(i) Inaconvexmirrorarayoflightparalleltotheprincipalaxisafterreflectionappearstodiverge from thefocus.

(ii) Inaconvexmirrorarayoflightdirectedtowardsthecentreofcurvatureafterreflectionis reflected back alongthe same direction.

(iii) Inaconvexmirrorarayoflightpassingthroughtheopticalcentregoeswithoutanydeviation.

(iv) Inaconvexmirrorarayoflightdirectedtowardsthefocusafterreflectiongoesparalleltothe principal axis.

Choose the correct option

(a) (i) (ii)and (iii) **(b) (i) (ii)and (iv)**

(c) (ii) (iiii)and (iv) **(d) (i) (iii)and (iv)**

Q3. The properties of the image formed by the plane mirrors are-
(i) Virtual (ii)laterallyinverted (iii) inverted

(iv)Sizeoftheimageisequaltothatoftheobject Choose

the correct option

(a) (ii) (iii)and (iv) **(b) (i) (iii)and (iv)**

(c) (i) (ii)and (iii) **(d) (i) (ii)and (iv)**

Q4.Whentheobjectisplacedbetweenthepoleofthemirrorand Itsprincipalfocusofconcave mirror, what would be the characteristic of the image?

(i) Virtual (ii)erect (iii)real (iv) Inverted

(v)Largerthantheobject. (vi) Smaller than the object.

Choose the correct option

(a) (i) (ii)and (v) **(b) (i) (ii)and (vi)**

(c) (iii) (iv)and (v) **(d) (iii) (iv)and (vi)**

Q 5. We use concave mirrors in day-to-day commonly -
(i) bydentist (ii) as shaving mirror (iii) as traffic mirror

(iv) Asrear-viewmirror (v) as reflectors in torches

Choose the correct option

(a) (i) (ii)and (iii) **(b) (i) (ii)and (iv)**

(c) (i) (ii)and (v) **(d) (i) (iv)and (v)**

ASSERTION-REASON BASED

From question numbers 1 to 5 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) and (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.

Q1. **Assertion (A):** Higher is the refractive index of a medium, lesser is the velocity of light in that medium.
Reason (R): Refractive index is inversely proportional to velocity.

Q 2. **Assertion (A):** When a concave mirror is held under water, its focal length will increase.
Reason (R): The focal length of a concave mirror is independent of the medium in which it is placed.

Q 3. **Assertion (A):** Refractive index has no unit.

Reason (R): The refractive index is a ratio of two similar quantities.

Q4. **Assertion (A):** An object placed at a distance of 15 cm from a convex mirror of focal length 15 cm, its image will be formed at infinity.

Reason (R): The distance of image in convex mirror can be never infinity.

Q5. **Assertion (A):** Property of converging of convergent lens does not remain same for all media.

Reason (R): Property of lens whether the ray is diverging or conversing is independent of the surrounding medium

CCT BASED

QI. Read the following passage carefully and answer the questions from 1 to 4.
Ram focused the image of a candle flame on a white screen by placing the flame at various distances from a concave mirror. He noticed his observation in the following table.

SET	Distance of candle flame from the mirror(cm)	Distance of screen from the mirror(cm)
1.	150	10
2.	25	15
3.	20	20
4.	15	25

5.	10	150
6.	5	70

Q1. Find out the focal length of concave mirror.

A.10 B.15 C.20 D.25

Q2. Which set of observation is incorrect?

A. 3 B. 4 C. 5 D. 6

Q3. In which set Ram gets the image of candle flame highly diminished?

A. 1 B. 2 C. 3 D. 4

Q4. In which observation he gets the same size of image as candle flame?

A. 1 B. 2 C. 3 D. 4

QII. Akash is studying in class X. He thinks about various changes related to light in his surroundings after the completion of a chapter about light in his school. The teacher taught him that light is a form of energy which involves the phenomena of reflection, refraction, polarization etc. He also learnt about the formation of image. When light rays actually meet, these results in formation of real image and when they appear to meet, a virtual image is formed.

1. Out of following which is the best reflector of light:

   A. Paper B. Wood C. Silver D. Cloth

2. How many images can be seen into two plane mirrors kept in front of each other? A. 2 B. 3

   C. 5 D. ∞

3. Anything which gives out light rays is called:

   A. Real image B. Virtual image C. Object

4. The image formed on a cinema screen and image formed in our eyes, are examples of:

   A. Real and Virtual C. Virtual and Real

   B. Real and Real D. Virtual and Virtual

QIII. The relationship between the distance of object from the lens (u), distance of image from the lens (v) and the focal length (f) of the lens is called lens formula. It can be written as $1/f=1/v-1/u$. The size of image formed by a lens depends on the position of the object from the lens. A lens of short focal length has more power whereas a lens of long focal length has less power. When the lens is convex, the power is positive and for concave lens, the power is negative.

The magnification produced by a lens is the ratio of height of image to the height of object as the size of the image relative to the object is given by linear magnification (m). When, m is negative, image formed is real and when m is positive, image formed is virtual. If $m<1$, size of image is smaller than the object. If $m>1$, size of image is larger than the object.

(i) An object 4 cm in height is placed at a distance of 10 cm from a convex lens of focal length 20 cm. The position of image is

A. 10 cm B. -10 cm C. 20 cm D. -20 cm

(ii) In the above question, the size of image is

A. 2 cm B. 4 cm C. 6 cm D. 8 cm

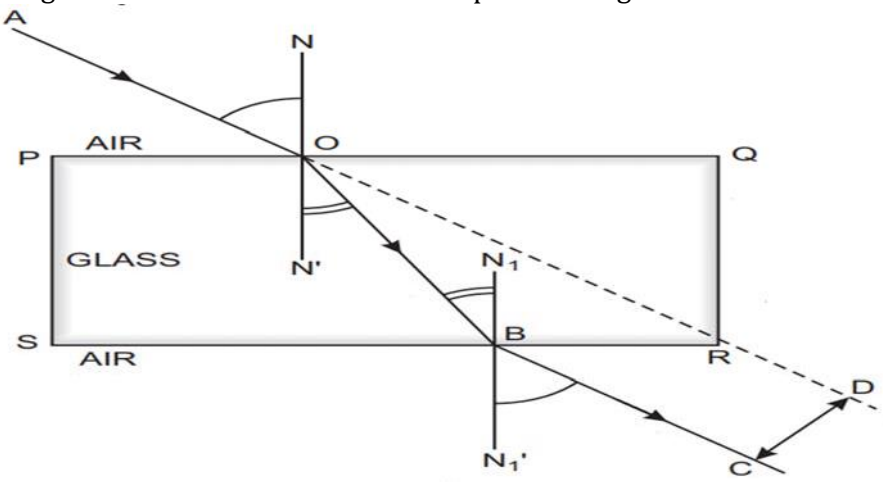
(iii) An object is, placed 50 cm from a concave lens and produces a virtual image at a distance of 10 cm in front of lens. The focal length of lens is

A. 12 cm B.-12.5cm C.10cm D. -10cm

(iv) A concave lens of focal length 5 cm, the power of lens is

A. 0.2D B -0.2 D C.-2D D.-20D

Q. IV Ram placed a glass slab on a drawing sheet and marked its boundary as PQRS. Then he removed the glass slab and drew a line AO on the side PQ. He placed the glass slab in position, passed light from a laser torch through it along AO. He observed the path of light through the glass slab and marked the points O, B and C. PQ is the surface of separation of air and glass and that RS is the surface of separation of glass and air



1. Where does the incident and emergent ray meet in above figure??

a) inside the glass b) infinity c) above the glass slab d) none of these

2. Which is of greater optical density?

a) Air b) Glass c) Both Glass and Air

3. Is the angle of refraction greater or lower than the angle of incidence when it goes from glass to air?

a) Greater b) Lower c) Equal d) None of these

4. In the above figure lateral displacement is mentioned by

a) AO b) OB c) BC d) CD

ANSWER

MCQ (Single response questions)

Ans1. Infinity

Explanation: it is cut of sphere of infinite radius

Ans2. Zero

Explanation: from snell's Law (sin i/sin r) = canstant Ans3. 1.5 cm

Explanation: for Erect Image object must lies between F and pole of concave mirror

Ans4. 1.66

Explanation: $n=V_{air}/V_m$

Ans5. Yes

Explanation:Fordeferentcolourrefractiveindexofmediumarediffrent Ans6. At the focus

Explanation:Lightrayincidentthroughfocusbecomeparalleltoprincipalaxis Ans7. Either plane or convex.

Explanation: Size of image does not depend on position of object

Ans8. Less than one

Explanation: Image formed by convex mirror always diminished Ans9. Glycerine

Explanation:opticaldensityofGlycerineisgreaterthanothers Ans10. 55^0,55^0,

Explanation:incidentangle θ_1=90-35 andangleofrefraction=angleofincident Ans11. Convex

Explanation:Sizeofimageformedbyconvexmirrordoesnotdependonpositionofobject Ans12 . Snell's law

Ans13. greater than unity

Explanation: from Snell's Law (sin i/sin r)=n

Ans14 At less thanf

Explanation: for Virtual image object must lies between F and optical centre

Ans15. -2 (**Explanation**: O=2 cm, f=10 cm, u=-15 cm from (1/f)=(1/v)-(1/u) v = 30 cm and from m=(v/u) m= -2)

MCQ(Multiple Responce)

Q1.(a) Q2.(b) Q3. (d) Q4. (a) Q 5. (c)

ASSERTION-REASON BASED

Ans1-A Ans2-D Ans3-A Ans4-D Ans5-C

CCT BASED

QI.

Q1.A.10 Q2.D.6 Q3.A.1 Q4. C.3

QII.

1.C.Silver 2. D.∞3.C.Object 4. Real and Real

QIII.

(i)-20 cm (ii) D.8cm (iii)B.-12.5cm (iv) D.-20D

QIV.

1.b)infinity 2.b)Glass 3.a)Greater 4.d) CD

Human Eye and Colorful World
MCQ (Single Response Type)

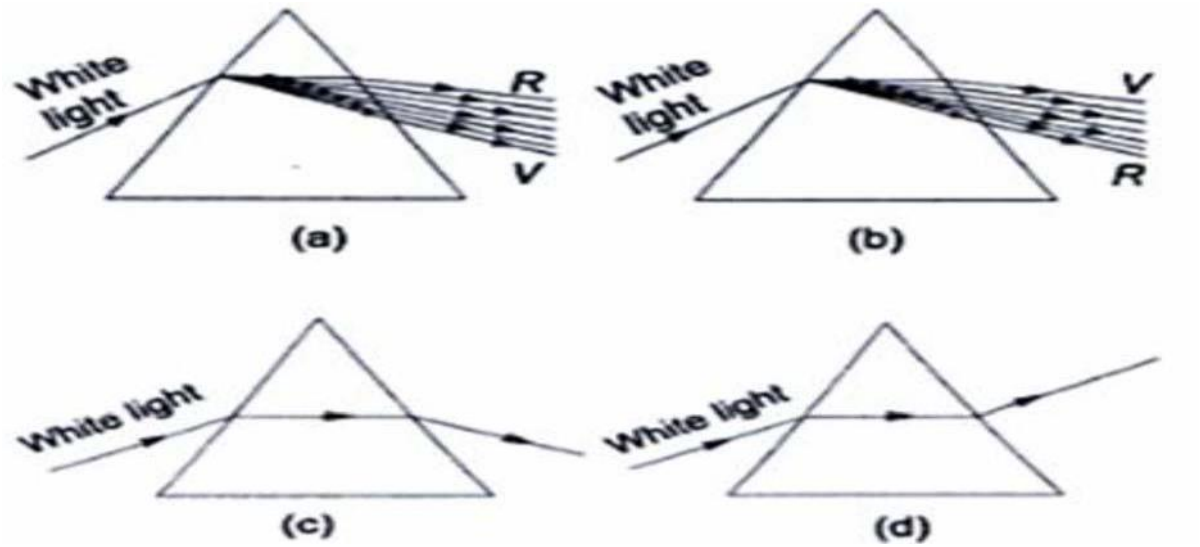
1. When white light is propagating through air which of the following statements is true:
(a) Red light moves fastest
(b) Blue light moves fastest
(c) All the colours of the white light move with the same speed
(d) Yellow light moves with the mean speed as that of the red and violet light.

2. When a beam of white light falls on a glass prism, the color of light which will deviate least and most are:
(a) Violet and Red (b) Red and Violet (c) Green and Violet (d) Blue and Red

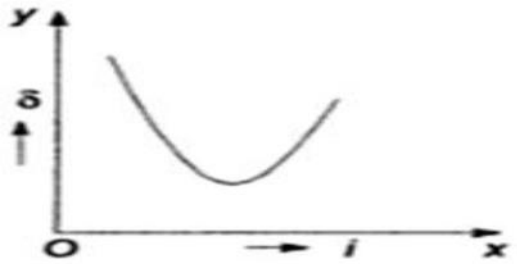
3. The star appear shifted from their actual position due to the phenomenon of:
(a) Diffraction of light (b) Scattering of light
(c) Refraction of light (d) Reflection of light

4. Blue colour of the sky is due to the phenomenon of:
(a) Reflection of light (b) Refraction of light
(c) Dispersion of light (d) Scattering of light

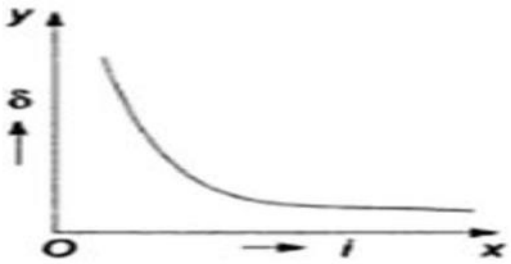
5. Which of the following figures correctly represents the passage of white light through prism?



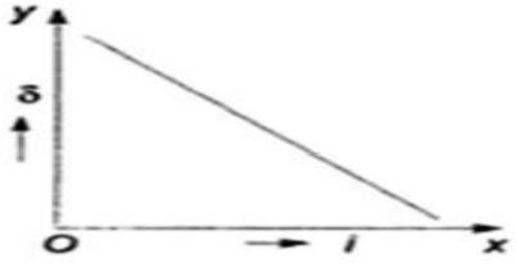
5. Which of the following graph represents the correct variation of angle of incidence (i) and angle of deviation (δ)?



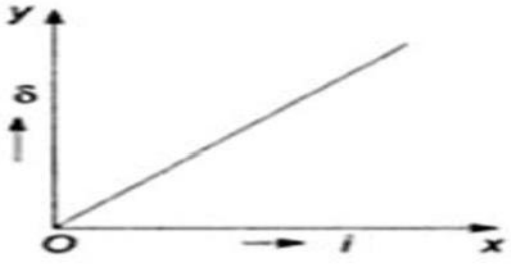
(a)



(b)



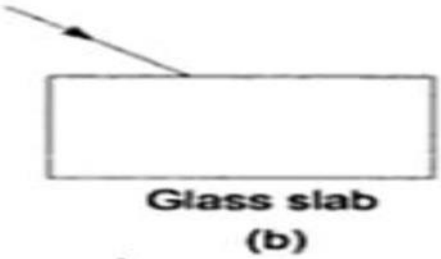
(c)



(d)

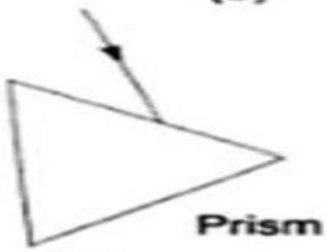
7. Inwhichofthefollowingcaseswillnodispersiontakeplacewhensunlightpassesthroughit

Prism
(a)



Glass slab
(b)

Prism
(c)



Prism
(d)

8. Lengthofthedayisincreasedby4minutesdueto _____ of light.

(a) Scattering (b) Refraction
(c) Totalinternalreflection (d) Dispersion

9. Arayoflighttravellinginairfallobliquelyonthesurfaceofacalmpond.Itwill-*
(a) Gointowaterwithoutdeviatingfromitspath (b)
Deviateawayfromthenormal.
(c) Turnbackonitsoriginalpath. (d)
Deviatetowardsthenormal

10. What Colour we obtain on mixing red, green and blue light?
(a) White (b) Black (c) Cyan (d) Magenta

MCQ (Multiple Response Type)

1. Which are true in the following?
(i) Red colour of sun during sunset is due to scattering of light
(ii) Scattering is same for all colours when size of scattering particles is smaller than wavelength.
(iii) Twinkling of stars is due to scattering of light
(iv) Scattering is same for all colours when size of scattering particles is greater than wavelength

Choose the correct option

(a) Only (i). (b) (i) And (ii) (c) (i) and (iv) (d) (i), (ii) and (iv)

2. 1. Which are the phenomenons involved in the formation of rainbow?
(i) Refraction, (ii) dispersion (iii) Total internal reflection (iv) Reflection

Choose Correct Option:-

(a) (i), (ii) and (iii) (b) (i) And (ii)
(c) (ii) and (iii) (d) (i), (ii) and (iii)

3. Which of the following happen due to atmospheric refraction?
(i) Twinkling of stars
(ii) Advance sunrise and delayed sunset (iii)
Flickering the object above the fire
(iv) Blue colure of sky

Choose Correct Option:-

(a) Only (i). (b) (i) And (iv)
(c) (ii) (iii) and (iv) (d) (i), (ii) and (iii)

Assersion and Reasoning Type Question

Instructions:
Two statements are given-one labeled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is NOT the correct explanation of A
c) A is true but R is false
d) A is false and R is also false

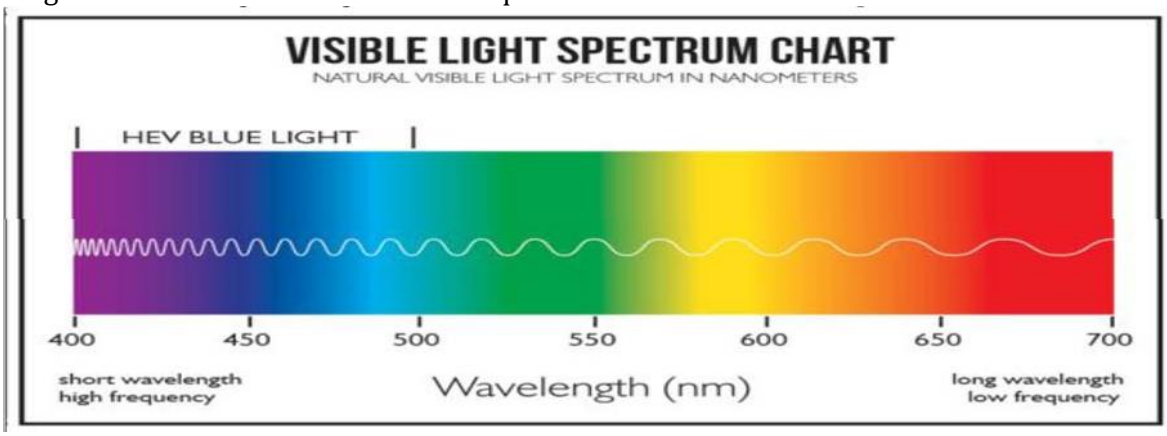
1. **Assertion** : The cloud in sky generally appear to be whitish.
Reason : Diffraction due to cloud is efficient in equal measure at all wavelengths
2. **Assertion** : A beam of white light gives a spectrum on passing through a hollow prism.
Reason : Speed of light outside the prism is different from the speed of light inside the prism.

3. **Assertion** : The sky appear reddish during sunrise and sunset.
Reason : Red light Scattered lesser than other colures.

Case study based questions

I- SCATTERING OF LIGHT

Ankitha and Nikitha are sisters. Both are students. One evening, while walking in a beach Nikitha, the younger sister noticed the red colour of the sky during the Sun set. She asked her sister why the sky sees read in colour. Ankitha, who recently studied about light told that it happens because of scattering. Scattering is nothing but irregular reflection. Scattering of light depends on its wavelength. Red colour has long wavelength, because of which less scattering takes place. Blue scatters more. This type of scattering is known as selective scattering or Rayleigh's scattering. It happens when the size of the scattering particles are smaller than the wavelength of light. Otherwise all colours scatter in equal amount.



1 Which colour of light scatter less?

(a) Red (b) Violet (c) Green (d) Yellow

2. By analyzing the diagram 1 which are Correct

(A).Bluescattersmorethanred (B).
Red scatters more than orange
(C). Green scatters more than yellow

Choose Correct Option:-

(a) Only (A).
(b) (A) And (B)
(c) (A) and (C)
(d) (C) and (B)

3. Sometimes sky appears to be white, due to
(A) the size of the molecules is larger than the wavelength of light
(B) all colour of light will be scattered in equal amount
(C) the size of the molecules is smaller than the wavelength of light

Choose Correct Option:-

(a) Only (A).
(b) (A) And (B)
(c) (B) and (C)
(d) (A), (B) and (C)

II- Formation of rainbow

One day Anjith and family were going to their village in a car. During the journey it was raining. Children were enjoying travelling in rain. It was a high range route. After sometime rain stopped and started to get bright sunlight. It was at that time, his younger son noticed a rainbow in the sky. His curious mind could not stop him to ask how it forms. Anjith explained his children how a rainbow forms.

1. Which are the phenomenons involved in the formation of rainbow?
(A) Refraction, (B) dispersion (C) Total internal reflection (D) Reflection

Choose Correct Option:-

(a) (A), (B) and (D)
(b) (A) And (B)
(c) (B) and (C)
(d) (A), (B) and (C)
2. Which acts as prism in the formation of rainbow?
(a) Water droplets present in the atmosphere
(b) Layers of atmosphere (c)
Water Drop
(d) None of these
3. Which is/are true in the following statements?
(a) Rainbow is formed on a sunny day without rain
(b) Rainbow can be seen from the surface of moon. (c)
Rainbow is formed during rain
(d) Rainbow is formed just after the rain

ANSWERS

MCQ (Single Response Type)

1. (c) All the colors of the while light move with the same speed.

Explanation: Speed of light not depends on colures of light

2. (b) Red and Violet

Explanation: Refractive index of prism for red is least than for the Violet is most

3. (c) Refraction of light

Explanation:- Atmospheric refraction

4. (d) Scattering of light 5.

(a)

Explanation:- Refractive index of prism for red is least than for the Violet is most 6. (a)

7. (b)

Explanation:- No dispersion take place in glass slab

8. (b) Refraction
9. (d) Deviate towards the normal

Explanation:- Light enters from rare to denser mediam

10. (a) White

MCQ (Multiple Response Type)

1. (b) (i) And (ii)
2. (d) (i),(ii) and (iii)
3. (d) (i),(ii) and (iii)

Assersion and Reasoning Type Question

1. c) A is true but R is false

2. d) A is false and R is also false

3. a) Both A and R are true and R is the correct explanation of A

Case study based questions

I- **SCATTERING OF LIGHT**

1. (b) Violet
2. (c) (A) and (C)
3. (b) (A) And (B)

II- Formation of rainbow

1. (d) (A), (B) and (C)
2. (a) Water droplets present in the atmosphere
3. (d) Rainbow is formed just after the rain