مراجعات النخبة

بنك الأسئلة

Science

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Science



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1st Prep

Second Term



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مراجعات النخبة
من
تراست أكاديمى اونلاين
2026



أكاديمية تراست
اونلاين
ابتدائي-إعدادي-ثانوي

لغات -تجريبي- عربي-أزهري

ناشيونال-انترناشيونال

(مناهج امريكي-كامبردج-مناهج خليجية)

- متاح حجز مجموعات الشرح الشهرية
مع فريق اساتذة اعداد مراجعات النخبة
- أنظمة مجموعات شهرية تناسب الجميع
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1 Write down what the following sentences mean

Unit 1

1- Elements that have metallic luster and are good conductors of heat and electricity. .....

2- A liquid metallic element that has good electrical conductivity. .....

3- Brittle elements in which the last energy level contains more than 4 electrons. .....

4- A nonmetal that is a good conductor of electricity and used in the dry cells. .....

5- The atoms of the solid metal are gathered in a certain arrangement. .....

6- The attraction force between positive metal ions and the negative valence electron cloud which surrounds them. .....

7- A mixture composed of the melts of two metals or more. .....

8- The process of the conversion of the wastes into new usable substances. .....

9- An ion composed of more than one atom of more than one element. .....

10- A scientist who clarified that alkalis are substances that dissolve in water and give (produce) hydroxide ions. .....

11- Acids produced from the combination of hydrogen with one of the negatively charged atomic groups, excluding hydroxide group. .....

12- An acid secreted by the stomach that participates in food digestion. .....

13- An acid accumulated in the muscles of the body during their lack of oxygen, causing muscle cramps. .....

14- A substance whose dissolution in water leads to an increase in the percentage of H^+ cations in the solution. .....

15- A substance whose dissolution in water leads to an increase in the percentage of OH^- anions in the solution. .....

16- The cation which is responsible for the properties of the acids. .....

17- The anion which is responsible for the properties of the alkalis. .....

18- Acids that are good electrical conductors. .....

19- Metal oxides, some of which dissolve in water forming alkalis. .....

20- Nonmetal oxides that dissolve in water forming acids. .....

21- Rains which result from the dissolution of acidic oxides in the atmospheric water vapour. .....

22- Chemical substances whose colour differs in acidic medium from that in alkaline medium. .....

23- An indicator that can differentiate between the different acids or the different alkalis according to their strength. .....

24- A plant whose flowers colour differs depending on the acidity or the basicity of the soil. .....

25- A Danish scientist who developed pH scale to differentiate between acidic, basic and neutral solutions. .....

26- A scale that ranges between the values 0 to 14, and is used to determine the acidity and the basicity of solutions. .....

27- A device used to measure the pH value of solutions directly and accurately. .....

28- Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion. .....

29- The set of points through which the object passes during its motion. .....

30- The total length of any path taken by the object during its moving from the starting point to the end point. .....

31- The shortest straight path connecting between the starting point and the end point in a constant direction. .....

32- The distance covered per unit time. .....

33- The amount of energy required to move an object through a certain displacement in the same direction of the force acting on it. .....

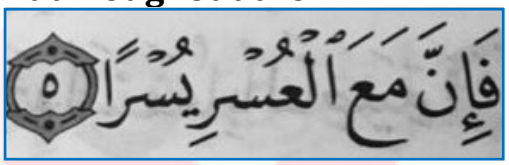
34- The quotient of the work done divided over the displacement, which is estimated in newtons. .....

35- One of the skills in scientific research and designing scientific comparative experiments. .....

36- The variable which is changed during the experiments. .....

37- The variable to be tested which is being changed in response to changing the independent variable. .....

38- The variables that are controlled to remain constant throughout the experiment. .....



39- ability to do work. .....

40- The energy stored in the object as a result of the work done on it. .....

41- The product of multiplying the mass of the object by the Earth's gravitational field intensity. .....

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2 Complete the following sentences

Unit 1

1- The outer energy level of metals contains less than ..... electrons, while non-metals contain more than ..... electrons.

2- Element (A) has two electrons in its outer energy level (M), so its type is ..... and Element (B) has six electrons in its outer energy level (L) has six electrons its type .....

3- All metals are solid substances except ..... is a liquid

4- All non-metals are poor conductors of electricity except .....which is a good conductor of electricity.

5- Non-metals exists in three states, solid such as ..... and gaseous, such as ..... and the only liquid is .....

6- The atoms of solid metals are arranged in a pattern known as .....

7- The metallic bond is occurs as a result of the attraction force between ..... positive metal and the surrounding negative ..... cloud.

8- Bronze alloy is composed of 5% ..... and 95% ..... And characterized by being more ..... than copper and its ..... for rusting.

9- Oxygen acids are those that contain the ..... element such as ..... and .....

10- Hydrochloric acid and ..... are acids that do not contain the ..... element.

11- The number of hydrogen atoms in the acid molecule equals the ..... charge of the component, while the number of hydroxide groups in the alkali molecule equals the charge of the component .....

12- Lactic acid supplies muscles with ..... ,When oxygen is deficient and accumulates in the muscles, it causes .....

13- The scientist ..... explained that acids are substances that dissolve in water and give ..... positive ions, while alkalis give ..... negative ion when dissolved in water.

14- The total charge of any compound molecule is equal to .....

15- The stomach secretes ..... acid which helps in .....

16- Hydrochloric acid ..... reacts with sodium hydroxide ..... and form salt ..... (NaCl) and ..... (H_2O) or written (HOH).

17- The molecular formula of the alkali containing the cation Ca^{+2} .....

18- Lemon and ketchup are considered ..... substances, while toothpaste and baking soda are ..... substances.

19- When hydrochloric acid dissolves in water, it produces ..... and ..... ions.

20- When magnesium hydroxide dissolves in water, the following ions are formed ..... and .....

21- Acids react with alkalis to form ..... and .....

22- Nitric acid is considered a ..... acid, while nitrous acid and sulphurous acid are ..... acids.

23- Metals burn in an oxygen atmosphere and form ..... most of them are known as ..... oxides

24- Non-metals burn in an oxygen atmosphere and form ..... most of them are known as ..... oxides

25- The dissolution of sulphur trioxide in water produces .....

26- Melting ..... in water produces magnesium hydroxide .....

27- The combustion of fossil fuels produces oxides ..... and .....

28- ..... chemicals that change colour in an acidic medium compared to a

basic medium, such as .....

29- We reduce soil acidity by adding substances such as .....

30- The pH value of acids Less than 7, while in ..... it is greater than 7.

31- The pH value of a solution of table salt (sodium chloride) is .....

32- The hydrogen number is accurately measured using .....



33- Acidic gases ..... and .....

34- Basic gases ..... and .....

35- Neutral gases on litmus paper are ..... and .....

36- Produced by the reaction of acids with alkali ..... and .....

37- Copper sulphate salt is ..... in colour, while ..... salt is white in colour.

38- ..... Salt consists of calcium cation and sulphate anion

39- Ammonium chloride solution turns litmus paper ..... , while ..... solution blue litmus paper.

Unit 2

40- The measuring unit of distance and displacement .....

41- The measuring unit of speed ..... and .....

42- Speed =.....

43- The measuring unit of work ..... while the newton is the measuring unit of .....

44- ..... force × displacement

45- Factors affecting potential energy are ..... and .....

46- The measuring unit of weight .....



47- Potential energy = ...

48- 5 *km* ..... m, 3kJ = ... *J*

49- The set of points through which a body passes during its motion is known as .....

50- ..... It is defined as the shortest straight line between the starting point and the end point.

51- The distance traveled during a unit of time is defined as ..... while the ability to perform work is called .....

52- Energy is measured in units of ..... and work is measured in units of .....

53- Mass is measured in units of ..... and weight is measured in units of .....

54- The work done is directly proportional to ..... and .....

3 Choose the odd word (or phrase) out, then mention the relation between the rest:

Unit 1

1. Gold / Silver / Bromine / Mercury
2. Phosphorus / Bromine / Mercury / Sulfur
3. Graphite / Bromine / Phosphorus / Sulfur
4. Iodine / Sulfur / Carbon / Hydrogen
5. Bronze / Chlorine / Copper / Tin



4 Give reason for (scientific explanation) for each of the following

Unit 1

1- Calcium ($_{20}$Ca) is metal while Chlorine ($_{17}$CI) is non-metal.

.....

2- Carbon is used in the manufacture of dry columns even though it is not a metal.

.....

3- Calcium ($_{20}$Ca) is harder than sodium ($_{11}$Na).

.....

4- Bronze alloy is used in the manufacture of medals instead of copper.

.....

5- Acids turn blue litmus paper into red.

.....

6- Alkalis turn red litmus paper into blue.

.....

7- Magnesium milk is used to treat stomach acidity.

.....

8- Litmus paper is not suitable for distinguishing between strong and weak acids.

.....

9- Distilled water does not affect litmus paper.

.....

10- A pH meter is more accurate than universal strips in determining the pH value of a solution.

.....

11- Sodium chloride salt is an ionic compound

.....

12- It cannot sink in the Dead Sea.

.....

13- Graphite is used to make the positive electrode of a dry cell battery (battery stone)

.....

14- Aluminum ($_{13}$Al) is harder and has a higher melting point than sodium ($_{11}$Na).

.....

15- Metals are good conductors of electricity.

.....

16- Bronze is more resistant to rust than pure copper.

.....

17- Magnesium chloride molecule is composed of one magnesium cation and two chloride anions.

.....

18- Calcium is added to acidic soil.

.....

19- The color of hydrangea flowers changes depending on the type of soil.

.....

20- Chemical indicators only work in the presence of water.

.....

21- Some metallic elements are recycled.

.....

22- Occurence of acid rain occurs.

.....

23- Hydrochloric acid is used in the digestion of food.

.....

24- Muscle tension occurs when there is a lack of oxygen in the muscles.

.....

25- Copper is used in the manufacture of electrical wires.

.....

26- Most alloys are not expressed in molecular form.

.....

Unit 2

27- The speed of the moving object decreases if it required longer time to cover the same distance.

.....

28- When the speed of an object increases, the covered distance at the same time increases.

.....

29- A person pushing against a wall does not perform work.

.....

30- A person pushing a shopping cart performs work.

.....

31- The role of fuel within a car is similar to the role of food within a living organism.

.....

5 what can be observed when (what happen if)

Unit 1

1- Hammering a piece of graphite

.....

2- Increasing the number of valence electrons in metal atoms relative to the metallic bond

.....

3- Mixing molten gold with molten copper.

.....

4- Passing an electric current through sulphuric acid and acetic acid in relation to lighting a lamp

.....

5- The reaction of acids with alkalis

.....

6- Heat a piece of magnesium and add the result to water, then place a red litmus paper in the solution.

.....

7- Melting sulphur oxides in rainwater

.....

8- Place a piece of sugar in a test tube containing concentrated sulphuric acid.

.....

9- Place a red and a blue sunflower paper in a tube containing hydrogen gas.

.....

10- Place a red and a blue sunflower paper in a tube containing chlorine gas.

.....

11- Add calcium hydroxide to acidic soil.

.....

12- You dip two litmus strip in a cup containing an acidic solution.

.....

13- You dip two litmus strip in a cup containing an alkaline solution.

.....

14- You dip two litmus strip in a cup containing distilled water.

.....

15- Accumulation of lactic acid in muscles.

.....

16- Combustion of metal with oxygen.

.....

17- Combustion of non-metal with oxygen.

.....

18- Melting of sulfur and nitrogen oxides in water vapor in the atmosphere.

.....

Unit 2

19- Increasing in body weight relative to its potential energy.

.....

20- Decreasing in distance traveled during the same time.

.....

21- Strong impact on an object with zero displacement.

.....

22- Vehicles exceed the permitted speed limits.

.....

23- A moving object covers the same distance it travelled in half the time (Regarding its speed).

.....

24- Exerting a suitable force on a stationary object (an object at rest).

.....

25- The force which affects an object increases in the direction of its movement (Regarding the work done).

.....

26- The weight of an object is doubled while its height above the ground remains constant (Regarding its potential energy).

.....

27- The vertical distance to which the object is lifted above the ground decreases to half while its weight remains constant (Regarding its potential energy).

.....

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6 Answer the following

Unit 1

1. What is the benefit of recycling metal waste?

.....

2. Two elements (A, B) their melting points is $(1538°\ C - 115.21°C)$

A- What type are they? Explain your answer.

.....

B - Which one is a good conductor of electricity?

.....

C - Which one can be hammered and drawn?

.....

Unit 2

3. Calculate the time taken by a car moving at a speed of 40 m/s to cover a distance of 200 m

.....

4. Calculate the height of an object of mass 6 kg above the ground when its potential energy is 180 J, knowing that the gravitational field intensity is 10 N/kg

.....

5. Calculate the speed of an object that covers distance of 50 km in 2 h.

.....

6. Calculate the time required to cover a distance of 300 m if the object moves at a speed of 20 m/s.

.....

7. A person pushes an object with a force of 40 N, causing it to move in a straight line for a distance of 10 m. Calculate the amount of work done.

.....

8. Calculate the potential energy of an object with a mass of 15 kg at a height of 150 cm, given that the acceleration due to gravity is 10 m/s^2 .

.....

9. An object moves at a speed of 20 $km\ /h$. Calculate the distance traveled after 3h.

.....

10. An object exerted a work of $(50\ J)$ to move a wheel a distance of $(10\ m)$. Calculate the amount of force required to exert the work.

.....

11. An object has a potential energy $(240\ J)$ at a height of $(12\ m)$. Calculate the weight of the object.

.....

12. What factors determine potential energy?

.....

13. What is the relationship between work and both force and displacement?

.....

14. What mathematical relationship is used to calculate velocity?

.....

15. What mathematical relationship is used to calculate work?

.....

16. What mathematical relationship is used to calculate potential energy given weight?

.....

17. What mathematical relationship is used to calculate potential energy given mass?

.....

18. What are the conditions for doing work?

.....

7 Write the chemical formula for the following compounds

Unit 1

1. Hydrochloric acid

.....

2. Hydrobromic acid

.....

3. Sulphuric acid

.....

4. Phosphoric acid

.....

5. Nitric acid

6. Potassium hydroxide

7. An atomic group consisting of three elements

8. Nitrous acid

9. Sodium chloride

10. Calcium hydroxide

11. Aluminum sulfate

12. Potassium nitrate

13. Sodium carbonate

14. Magnesium oxide

15. Calcium phosphate

16. Iron (III) chloride

17. Hydrogen sulfide

18. Ammonium hydroxide

19. Sulfuric acid

20. Sulfur dioxide

.....

21. Nitrogen monoxide

.....

22. Silver nitrate

.....

23. Sodium sulfide

.....

24. Aluminum oxide

.....

25. Sodium hydroxide

.....

8 What is the use(function) of each of the following

Unit 1

1. Stomach acid

.....

2. Litmus paper

.....

3. Graphite

.....

4. Bronze alloy

.....

5. Recycling of elements

.....

6. Lactic acid

.....

7. Magnesium milk

.....

8. Sulfur and nitrogen oxides

.....

9. Acidic oxides

.....

10. Basic oxides

.....

11. Adding tin to copper

.....

12. Adding calcium hydroxide to soil

.....

13. Universal guide

.....

14. pH meter

.....

15. Scientist Soren Sorensen

.....

16. Scientist Arrhenius

.....

9 Write the names of the following compounds and state their type

Unit 1

1. H_2CO_3

.....

2. H_2S

.....

3. H_3PO_4

.....

4. NaCl

.....

5. $Ca(OH)_2$

.....

6. $Al_2(SO_4)_3$

.....

7. KNO_3

8. Na_2CO_3

9. MgO

10. $Ca_3(PO_4)_2$

11. H_2S

12. NH_4OH

13. H_2SO_4

14. HNO_3

15. HCl

16. SO_2

17. NO

18. $AgNO_3$

19. $CuSO_4$

20. Na_2S

21. $NaHCO_3$

22. Al_2O_3

.....

23. $MgSO_4$

.....

.....

10 Give one example for each of the following, writing the molecular formula

Unit 1

1. Weak acid

.....

2. Strong acid

.....

3. Strong base

.....

4. Weak base

.....

5. Metal oxide

.....

6. Non-metal oxide

.....

7. Gas that turns blue litmus red

.....

8. Gas that turns red litmus blue

.....

9. Gas that has no effect on litmus

.....

10. Chemical indicator that accurately measures pH

.....

11. White salts

.....

12. Colored salt

.....

13. Salts that dissolve in water

.....

14. Salts poorly soluble in water

.....

15. Metals

.....

16. Non-metals

.....

17. Alloys

.....

18. Acids

.....

19. Bases

.....

20. Oxides

.....

21. Salts

.....

22. Monovalent atomic group

.....

23. Divalent atomic group

.....

24. Trivalent atomic group

.....

25. Oxyacid

.....

26. Non-oxygenic acid

.....

27. Acid in your body

.....

28. Alkaline

.....

29. Metallic oxide

.....

30. Non-metallic oxide

.....

31. Alkaline substance used as medicine

.....

32. Body that performs work

.....

33. Body that does not perform work

.....

11 Choose the correct answer

Unit 1

(1) All the following are properties of sodium element, except that it .....

(A) is a metal.
(B) has metallic luster.
(C) is a bad electrical conductor.
(D) is formable.

(2) Which of the following is the correct arrangement of the hardness of sodium $_{11}Na$, magnesium $_{12}Mg$ and aluminum $_{13}Al$?

(A) Na > Mg > Al
(B) Al > Mg > Na
(C) Mg > Na > Al
(D) Al > Na > Mg

(3) Element (X) its boiling point is 2807°C and its melting point is 1064°C Which of the following is a property of element (X)?

(A) Bad electrical conductor.
(B) Brittle.
(C) Formable.
(D) Opaque.

(4) Which of the following questions helps in the classification of some elements to metals and nonmetals ?

(A) Is it solid ?
(B) Is it liquid ?
(C) Is it coloured ?
(D) Is it brittle?



(5) What is the common property of both sodium and copper?

Ⓐ Colour. Ⓑ Density.
Ⓒ Melting point. Ⓓ Physical state.

(6) If the anion which composes the acid HClO is called hypochlorite, then the acid is called .....

Ⓐ hypochlorous acid. Ⓑ hypochloric acid.
Ⓒ perchloric acid. Ⓓ chlorous acid.

(7) What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?

Ⓐ H^+ Ⓑ OH^- Ⓒ Cl^- Ⓓ H^+

(8) Element (X) forms the oxide XO which reacts with acids. Which of the following represents (X) and XO ?

Ⓐ (X): Metal, XO: Acidic oxide. Ⓑ (X): Nonmetal, XO: Acidic oxide.
Ⓒ (X): Metal, XO: Basic oxide. Ⓓ (X): Nonmetal, XO: Basic oxide.

(9) On dissolving calcium oxide in water and placing two litmus strips in the solution , the colour of one of them changes into .....

Ⓐ red. Ⓑ purple. Ⓒ blue. D yellow.

(10) Which of the following are properties of solid sodium hydroxide ?

Ⓐ It dissolves in water, and reacts with HCl acid.
Ⓑ It dissolves in water, and does not react with HCl acid.
Ⓒ It does not dissolve in water and does not react with HCl acid.
Ⓓ It does not dissolve in water and reacts with HCl acid.

(11) A red litmus strip is placed in solution (1), so no change in colour occurs, when it is placed in solution (2), it becomes blue.
Which of the following is correct?

Ⓐ Solution (1): Neutral , Solution (2): Acidic.
Ⓑ Solution (1): Acidic , Solution (2) Neutral.
Ⓒ Solution (1): Acidic , Solution (2) Alkaline.
Ⓓ Solution (1): Alkaline , Solution (2): Acidic.



(12) The colour of the universal indicator is the same in both .....

(A) tomato juice and hydrochloric acid.
(B) distilled water and sodium chloride solution.
(C) tomato juice and sodium hydroxide solution.
(D) distilled water and hydrochloric acid.

(13) All the following from ions that form salts, except .....

(A) OH^- (B) Cl^- (C) NH_4^+ (D) NO_3^-

(14) All the following are properties of solid sodium carbonate salt, except that .....

(A) it dissolves in water.
(B) pH of its solution is higher than 7
(C) its colour is white.
(D) it conducts electricity.

(15) pH value of a solution is changed from 8 to 5, that means it was .....

(A) acidic and becomes alkaline.
(B) acidic and becomes neutral.
(C) alkaline and becomes neutral.
(D) alkaline and becomes acidic.

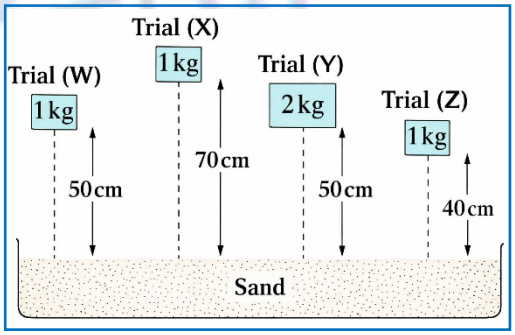
(16) From the table :

Indicator	Colour change	pH at which colour change
(X)	Red ⟹ Yellow	4
(Y)	Yellow ⟹ Blue	6.4

What is the pH value of the solution which acquires yellow colour when drops of both (X) and (Y) are added to it?

(A) 3 (B) 5 (C) 7 (D) 10

(17) The opposite figure represents an experiment that includes four trials (W) , (X) , (Y) and (Z):



Which of the following shows the controlled variable and the independent variable?

Choices	Trials	Controlled variable	Independent variable
(A)	(W) , (X)	Height	Mass

B	(W) , (Y)	Height	Mass
C	(X) , (Y)	Mass	Height
D	(X) , (Z)	Height	Mass



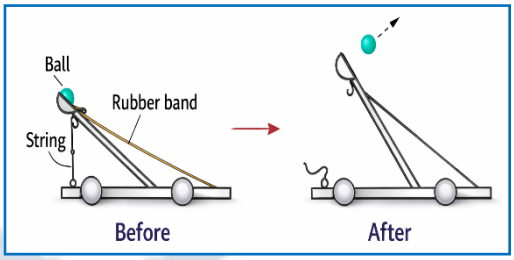
(18) Which of the following cases involves doing work?

A Lifting a bag from the floor, pushing a shopping cart.
B Carrying a backpack while walking, pushing a shopping cart.
C Lifting a bag from the floor, pushing a tree.
D Carrying a backpack while walking, pushing a tree.

(19) The potential energy of an object depends on .....

A its weight and speed.
B its weight and mass.
C its weight and height above the ground.
D its speed and height above the ground.

(20) The opposite figure illustrates the motion of a ball after the slingshot string is cut :



Which of the following leads the ball to cover the maximum possible distance?

Choices	Change	As the stored potential energy in the rubber band is
A	Using a ball with a greater mass	Less before cutting the string
B	Using a longer rubber band	Greater before cutting the string
C	Using a shorter rubber band	Less before cutting the string
D	Using a shorter string	Greater before cutting the string

12 Define the following (what is meant by)

Unit 1

Metal	.....
Nonmetal	.....

Metallic bond	.....
Alloy	.....
Recycling	.....
Atomic group	.....
Acid	.....
Alkali	.....
Basic oxides	.....
Acidic oxides	.....
Acid rains	.....
Indicators	.....
Universal indicator	.....
pH value	.....
Salts	..... Unit 2
Path of movement	.....
Distance (d)	.....
Displacement (s)	.....
Speed (v)	.....
Work (W)	.....
Controlling the variables	.....
Independent variable (Cause)	.....
Dependent variable (Effect)	.....
Controlled variables	.....
Energy (E)	.....

Potential energy (PE)	.....
The distance covered by an object equals 20 m	.....
The displacement of an object equals 10 m	.....
The speed of an object is 100 m/s	.....
A moving car covers a distance of 20 km in 2 h	.....
The potential energy of an object is 20 J	.....
An object with potential energy of 80 J is at a height of 10 m	.....

13 compare between each of the following

Unit 1

1- Phosphorus - Iron
2- Sodium and graphite
3- Sulphur and copper
4- Silver and phosphorus
5- Metals and nonmetals
6- Acid and alkali
7- HCl and NaOH
8- strong acids and weak acids



9- Strong alkalis and weak alkalis

10- Basic oxides and Acidic oxides

11- Ammonium chloride, Sodium chloride and Sodium carbonate solution

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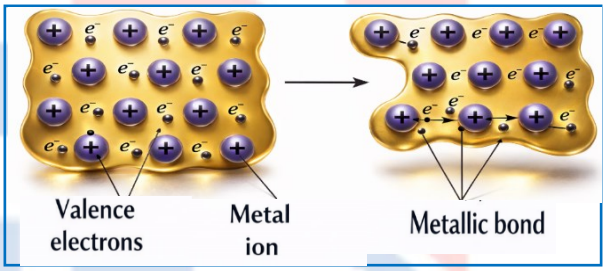
14 Various questions

Unit 1

1. Look at picture then answer the following:



a- The metallic bond arises as a result from the force of ..... between the cations and the ..... surrounding negative cloud

b- The metallic bond is responsible for ..... metals and the high ..... of it.

c- The strength of the bond is proportional to both the degree of ..... and the degree of .....

2. Look at picture then answer the following:



- Humans usually use alloys in industry. **Explain**

.....

- Alloys are mixtures, most of which cannot be expressed in .....

- Pure metals are ..... while alloys are .....

- One of the most famous alloys, bronze alloy, it consists of ..... at a rate of 5%, and ..... with 95% .



- Recycling of metals

- This refers to the conversion of metal ..... into new materials suitable for .....

- Among the most commonly recycled metals are .....

3. Look at picture then answer the following:



Hydrochloric acid (HCl) :

secreted by ..... and helps in .....

Lactic acid : Provides ..... with energy when there is a shortage of .....

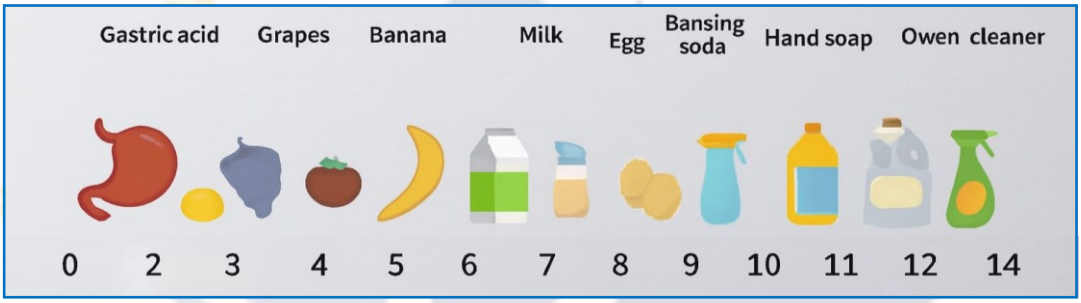
- ❖ The accumulation of acid ..... in the muscles causes .....

4. Identify the damage caused by acid rain :

.....

.....

5. The value of the basic solution increases as the pH number approaches 14



a- Which substances are less acidic ? .....

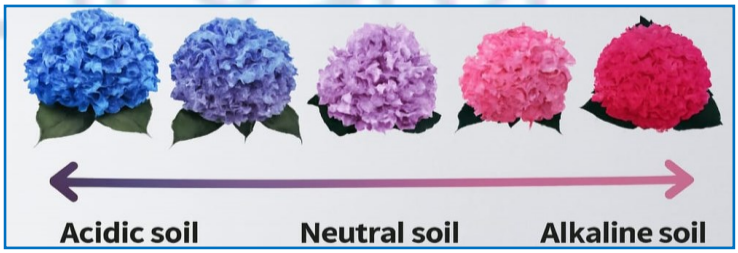
and which are more acidic ? .....

b- Which substances are less basic ? .....

Which are more basic ? .....

c- The colour of hydrangea flowers varies, where:

- They turn ..... in alkaline soil, and blue in acidic soil.

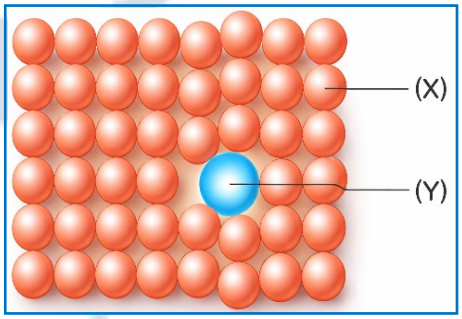


6. Physical properties of salts :

Salts differs from each other in :		
Color	White	.....
	Blue	.....
	Green	.....
Solubility in water	Soluble salt	.....
	insoluble	.....
pH value	Acidity	.....
	Alkalinity	.....
	Neutral	.....
Electricity	.....	
	.....	

The salinity of dead sea is ..... higher than that of the red sea, and therefore its density ..... (no object can sink in it)

7. The opposite figure illustrates the composition of the bronze alloy:



(1) What are the elements (X) and (Y)?

.....

(2) Why are alloys preferred to be used more than the pure metals?

.....

8. The table below shows the properties of 3 elements (a metal, a nonmetal and a metalloid) without order:

Element		Properties		
(X)	Solid at room temperature.	Shiny.	Brittle.	Heat conductor.
(Y)	Solid at room temperature.	Shiny.	Soft.	Electrical conductor.

(Z)	Solid at room temperature.	Opaque.	Brittle.	Bad electrical conductor

Identify the metal and the nonmetal of these elements, with explanation.

.....

9. Can the type of potassium hydroxide solution be identified by using the blue litmus strip? Explain.

.....



10. Element (X) oxide has the following properties:

- ❖ **It can react with acids.**
- ❖ **It does not react with alkalis.**

Is element (X) sulphur or copper? Explain.

.....

11. The opposite figures show the same statue left in open air for nearly 100 years :



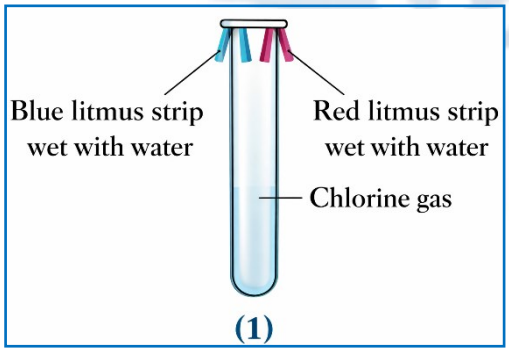


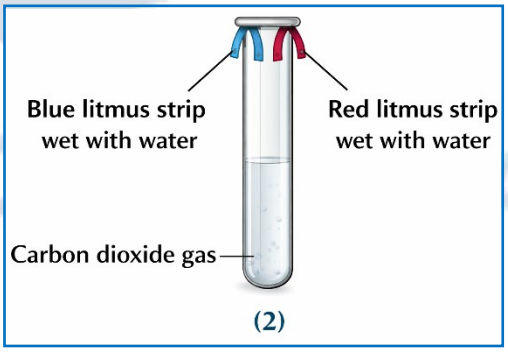
Why did the details of the statue disappear according to what you have studied?

.....

.....

12. What happens to the colours of the litmus strips in the following cases?





.....

.....

13. Acidity of the soil varies from one place to another:

(1) How can acidic soil be treated?

.....

(2) What is the colour of Hydrangea flowers which grow in acidic soil?

.....

14. Write the molecular formulas of the salts composed from the following cations and anions:

(1) K^+ , PO_4^{3-}

(2) $A1^{3+}$, SO_4^{2-}

(3) NH_4^+ , NO_3^-

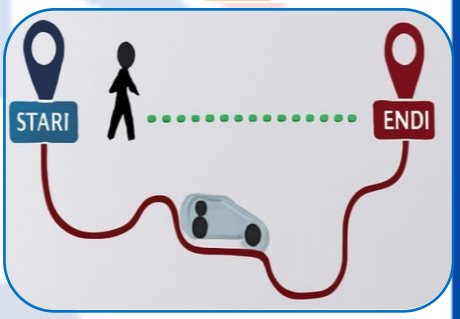
(4) Mg^{2+} , CO_3^{2-}

.....

.....

Unit 2

15. Distance or Displacement :

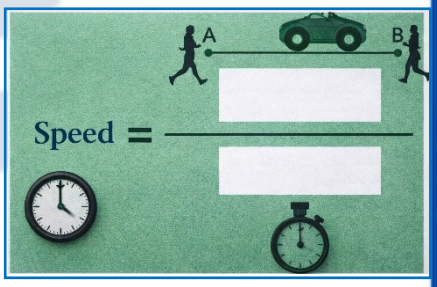


- The path taken by the car represents .....

- The path taken by the person represents .....

- The measuring unit for the physical quantity represented by the path of the car is .....

16. Complete the figure :



- Speed is defined as .....

Speed is measured in units of .....

- Calculate the speed of an object that covers distance of 10m in a time of 5s.

.....

- When is the distance covered equal to the displacement ?

.....



- When is the speed equal to the distance covered .....

17. Look at the two pictures.



2



1

-Which one shows work being done?

(Explain your answer.)

.....

.....

- Work is ..... and is symbolized by ..... and its measuring unit is .....

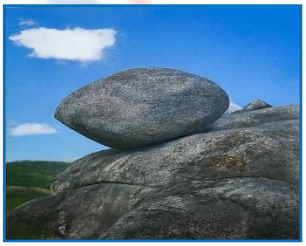
- The work mathematical relationship .....

- Energy is ..... and its measuring unit is .....

- What are the similarities between the static rock on top of the hill and the static ball on the playground?

.....





18. From the forms of the potential energy:

1- ..... potential energy like .....

2- ..... potential energy like .....

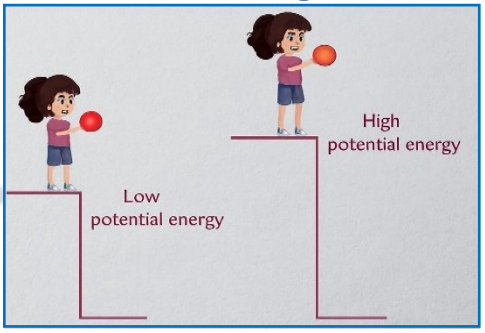
3- ..... potential energy like .....

19. Explain why the potential energy differs in the two cases shown in the figure.

.....

.....

.....



20. The value of potential energy can be obtained from the mathematical relationship

.....

21. What happens when the weight of the ball increases?

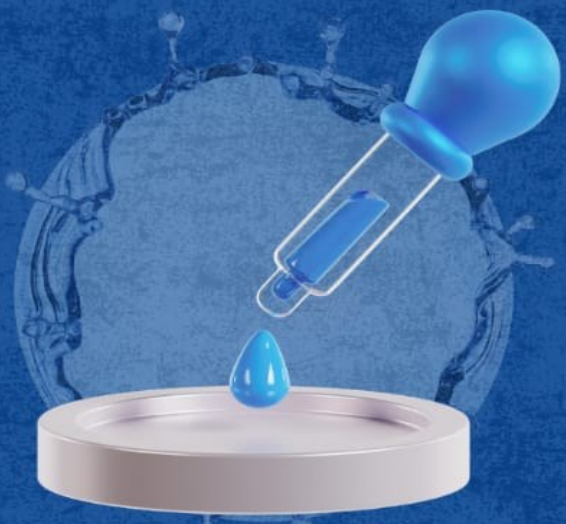
.....

مراجعات النخبة

Science
February and March Review
2026

Science

Answer Form



1st Prep
Second Term

Prepared by:
Mrs/Menna Hussein

1 Write down what the following sentences mean

Unit 1

1- Elements that have metallic luster and are good conductors of heat and electricity. Metals.

2- A liquid metallic element that has good electrical conductivity. Mercury

3- Brittle elements in which the last energy level contains more than 4 electrons. Nonmetals.

4- A nonmetal that is a good conductor of electricity and used in the dry cells. Carbon (Graphite).

5- The atoms of the solid metal are gathered in a certain arrangement. Metallic crystal lattice.

6- The attraction force between positive metal ions and the negative valence electron cloud which surrounds them. Metallic bond.

7- A mixture composed of the melts of two metals or more. Alloy.

8- The process of the conversion of the wastes into new usable substances. Recycling.

9- An ion composed of more than one atom of more than one element. Atomic group or polyatomic ion.

10- A scientist who clarified that alkalis are substances that dissolve in water and give (produce) hydroxide ions. The scientist Arrhenius.

11- Acids produced from the combination of hydrogen with one of the negatively charged atomic groups, excluding hydroxide group. Oxyacids.

12- An acid secreted by the stomach that participates in food digestion. Hydrochloric acid.

13- An acid accumulated in the muscles of the body during their lack of oxygen, causing muscle cramps. Lactic acid.

14- A substance whose dissolution in water leads to an increase in the percentage of H^+ cations in the solution. Acid

15- A substance whose dissolution in water leads to an increase in the percentage of OH^- anions in the solution. Alkall.

16- The cation which is responsible for the properties of the acids. Hydrogen cation.

17- The anion which is responsible for the properties of the alkalis. Hydroxide anion.

18- Acids that are good electrical conductors. Strong acids.

19- Metal oxides, some of which dissolve in water forming alkalis. Basic oxides

20- Nonmetal oxides that dissolve in water forming acids. Acidic oxides.

21- Rains which result from the dissolution of acidic oxides in the atmospheric water vapour. Acid rains.

22- Chemical substances whose colour differs in acidic medium from that in alkaline medium. Chemical indicators.

23- An indicator that can differentiate between the different acids or the different alkalis according to their strength. Universal indicator.

24- A plant whose flowers colour differs depending on the acidity or the basicity of the soil. Hydrangea plant.

25- A Danish scientist who developed pH scale to differentiate between acidic, basic and neutral solutions. The scientist Soren Sorensen.

26- A scale that ranges between the values 0 to 14, and is used to determine the acidity and the basicity of solutions. pH scale.

27- A device used to measure the pH value of solutions directly and accurately. pH meter device.

28- Compounds, mostly ionic, formed from the combination of an alkali cation with an acid anion. Salts.

29- The set of points through which the object passes during its motion. Path of movement.

30- The total length of any path taken by the object during its moving from the starting point to the end point. Distance.

31- The shortest straight path connecting between the starting point and the end point in a constant direction. Displacement.

32- The distance covered per unit time. Speed.



33- The amount of energy required to move an object through a certain displacement in the same direction of the force acting on it. Work.

34- The quotient of the work done divided over the displacement, which is estimated in newtons. Force.

35- One of the skills in scientific research and designing scientific comparative experiments. Controlling variables.

36- The variable which is changed during the experiments. Independent variable.

37- The variable to be tested which is being changed in response to changing the independent variable. Dependent variable.

38- The variables that are controlled to remain constant throughout the experiment. Controlled variable.

39- ability to do work. Energy.

40- The energy stored in the object as a result of the work done on it. Potential energy.

41- The product of multiplying the mass of the object by the Earth's gravitational field intensity. Weight.

---

2 Complete the following sentences

Unit 1

1- The outer energy level of metals contains less than 4 electrons, while non-metals contain more than 4 electrons.

2- Element (A) has two electrons in its outer energy level (M), so its type is Metal and Element (B) has six electrons in its outer energy level (L) has six electrons its type Non-metal.

3- All metals are solid substances except Mercury is a liquid

4- All non-metals are poor conductors of electricity except Graphite (Carbon) which is a good conductor of electricity.

5- Non-metals exists in three states, solid such as Sulfur/Carbon and gaseous, such as Oxygen/Chlorine and the only liquid is Bromine.

6- The atoms of solid metals are arranged in a pattern known as Crystal Lattice.

7- The metallic bond is occurs as a result of the attraction force between ions positive metal and the surrounding negative electrons cloud.

8- Bronze alloy is composed of 5% Tin and 95% Copper. And characterized by being more harder than copper and its resistant for rusting.

9- Oxygen acids are those that contain the Oxygen element such as H_2SO_4 and HNO_3

10- Hydrochloric acid and Hydrobromic acid HBr are acids that do not contain the Oxygen element.

11- The number of hydrogen atoms in the acid molecule equals the Anion charge of the component, while the number of hydroxide groups in the alkali molecule equals the charge of the component Cation

12- Lactic acid supplies muscles with Energy ,When oxygen is deficient and accumulates in the muscles, it causes Muscles cramps

13- The scientist Arrhenius explained that acids are substances that dissolve in water and give Hydrogen positive ions, while alkalis give Hydroxide negative ion when dissolved in water.

14- The total charge of any compound molecule is equal to Zero

15- The stomach secretes HCl acid which helps in Digestion of food

16- Hydrochloric acid (HCl) reacts with sodium hydroxide (NaOH) and form salt Sodium chloride (NaCl) and Water (H_2O) or written (HOH).

17- The molecular formula of the alkali containing the cation Ca^{+2} $Ca(OH)_2$

18- Lemon and ketchup are considered acids substances, while toothpaste and baking soda are alkalis substances.

19- When hydrochloric acid dissolves in water, it produces hydrogen (H^+) and chloride (Cl^-) ions.

20- When magnesium hydroxide dissolves in water, the following ions are formed magnesium (Mg^{2+}) and hydroxide (OH^-)

21- Acids react with alkalis to form Salt and water

22- Nitric acid is considered a strong acid, while nitrous acid and sulphurous acid are weak acids.

23- Metals burn in an oxygen atmosphere and form basic oxides most of them are known as metallic oxides

24- Non-metals burn in an oxygen atmosphere and form acidic oxides most of them are known as non-metallic oxides

25- The dissolution of sulphur trioxide in water produces sulphuric acid (H_2SO_4)

26- Melting magnesium oxide (MgO)in water produces magnesium hydroxide $Mg(OH)_2$

27- The combustion of fossil fuels produces oxides sulfur and nitrogen

28- Indicators chemicals that change colour in an acidic medium compared to a basic medium, such as litmus paper

29- We reduce soil acidity by adding substances such as calcium hydroxide $Ca(OH)_2$

30- The pH value of acids Less than 7, while in alkali it is greater than 7.

31- The pH value of a solution of table salt (sodium chloride) is =7 (neutral)

32- The hydrogen number is accurately measured using pH meter



33- Acidic gases SO_2 and CO_2

34- Basic gases NH_3 and NO

35- Neutral gases on litmus paper are oxygen (O_2) and nitrogen (N_2)

36- Produced by the reaction of acids with alkali salt and water

37- Copper sulphate salt is blue in colour, while zinc sulphate salt is white in colour.

38- Calcium sulphate Salt consists of calcium cation and sulphate anion

39- Ammonium chloride solution turns litmus paper red,, while sodium hydroxide (NaOH) solution blue litmus paper.

Unit 2

40- The measuring unit of distance and displacement meter (m),cm,km

41- The measuring unit of speed (m/s)and (km/h)

42- Speed = distance ÷ time

43- The measuring unit of work joule (J) and newton.meter (N.m) while the newton is the measuring unit of force

44- Work =force × displacement

45- Factors affecting potential energy are weight (w) and height (h)

46- The measuring unit of weight newton (N)

47- Potential energy = mass × gravitational acceleration (g) × height

48- 5 *km* 5000 m, 3kJ = 3000 *J*

49- The set of points through which a body passes during its motion is known as path of movement

50- Displacement It is defined as the shortest straight line between the starting point and the end point.

51- The distance traveled during a unit of time is defined as speed while the ability to perform work is called energy

52- Energy is measured in units of joule(J)and work is measured in units of joule(J)

53- Mass is measured in units of kilogram (kg)and weight is measured in units of newton (N)

54- The work done is directly proportional to force and displacement.

---

3 Choose the odd word (or phrase) out, then mention the relation between the rest: Unit 1

1. Gold / Silver / Bromine / Mercury The others are metals (Bromine is a liquid non-metal).
2. Phosphorus / Bromine / Mercury / Sulfur The others are non-metals (Mercury is a liquid metal).
3. Graphite / Bromine / Phosphorus / Sulfur The others are solid non-metals (Bromine is liquid).
4. Iodine / Sulfur / Carbon / Hydrogen The others are solid non-metals (Hydrogen is a gas)
5. Bronze / Chlorine / Copper / Tin The others are metals (Chlorine is a gaseous non-metal).

---

4 Give reason for (scientific explanation) for each of the following Unit 1

1- Calcium ($_{20}$Ca) is metal while Chlorine ($_{17}$CI) is non-metal.
Because Calcium has 2 electrons in its last energy level (2, 8, 8, 2), while Chlorine has 7 electrons in its last energy level (2, 8, 7).

2- Carbon is used in the manufacture of dry columns even though it is not a metal.
Because it is a good conductor of electricity.

3- Calcium ($_{20}$Ca) is harder than sodium ($_{11}$Na).
Because Calcium has 2 valence electrons, while Sodium has only 1. The strength of the Metallic Bond increases as the number of valence electrons increases.

4- Bronze alloy is used in the manufacture of medals instead of copper.
Because Bronze is harder, stronger, and more resistant to rust than pure copper.

5- Acids turn blue litmus paper into red.
Because it has high present of H^+ on its solutions



6- Alkalis turn red litmus paper into blue.
Because it has high present of OH^- on its solutions

7- Magnesium milk is used to treat stomach acidity.
To neutralize gastric hyperacidity as it contains magnesium hydroxide $Mg(OH)_2$

8- Litmus paper is not suitable for distinguishing between strong and weak acids.
Because it gives the same colour with both of them (red).

9- Distilled water does not affect litmus paper.
Because the number of H^+ cations equals the number of OH^- anions in the solution

10- A pH meter is more accurate than universal strips in determining the pH value of a solution.
Because pH meter device determines the pH value of any solution directly and accurately as indicated by the number displayed immediately on its digital screen, while universal indicator strips provide an approximate pH value.

11- Sodium chloride salt is an ionic compound
Because it are produced from the reaction of acids(HCl) with alkalis(NaOH), which the alkali cation(Na) combines with the acid anion(Cl) forming NaCl.

12- It cannot sink in the Dead Sea.
Because the high percentage of the salts in water leads to increasing its density.

13- Graphite is used to make the positive electrode of a dry cell battery (battery stone).
Because graphite is the only nonmetal which is a good electrical conductor.

14- Aluminum ($_{13}Al$) is harder and has a higher melting point than sodium ($_{11}Na$).
Because the number of valence electrons in aluminum atom (3) is greater than that in sodium atom (1) and as the number of valence electrons in metal atom increases, the strength of the metallic bond increases, so it is harder and has a higher melting point.

15- Metals are good conductors of electricity.
Because they contain free electrons that move freely throughout the metallic structure

16- Bronze is more resistant to rust than pure copper.
Because it is harder than copper and resistant to rust.

17- Magnesium chloride molecule is composed of one magnesium cation and two chloride anions.

Because the total charge of any salt equals zero, and magnesium cation carries two positive charges, while chloride anion carries one negative charge.

18- Calcium is added to acidic soil.

To treat the acidic soil by calcium hydroxide

19- The color of hydrangea flowers changes depending on the type of soil.

Because the flowers turn blue when planted in acidic soil, while they turn red when planted in basic soil.

20- Chemical indicators only work in the presence of water.

Because the chemical indicators act, generally, only in aqueous medium



21- Some metallic elements are recycled.

For the following reasons :

- Their percentages in the Earth's crust decreases.
- The difficulty of extracting them from their ores.
- The lower cost of recycling compared to extracting them from their ores.

22- Occurence of acid rain occurs.

As it causes the destruction of forests, harms the aquatic organisms, results in the corrosion of buildings, and leads to health problems in human respiratory system.

23- Hydrochloric acid is used in the digestion of food.

Because it participate in digestion process

24- Muscle tension occurs when there is a lack of oxygen in the muscles.

Due to accumulation of lactic acid in muscles

25- Copper is used in the manufacture of electrical wires.

Because it is good electrical conductor of electricity

26- Most alloys are not expressed in molecular form.

As the alloys are mixtures not compounds

Unit 2

27- The speed of the moving object decreases if it required longer time to cover the same distance.

Because the speed is inversely proportional to time at constant distance.

28- When the speed of an object increases, the covered distance at the same time increases.

Because the speed is directly proportional to distance at constant time.

29- A person pushing against a wall does not perform work.

Because the displacement equals zero.

30- A person pushing a shopping cart performs work.

Because the direction of the force applied is in the same direction of the motion.

31- The role of fuel within a car is similar to the role of food within a living organism.

Because the chemical energy found in food and fuel is the potential energy stored in the chemical bonds, released and converted into kinetic energy when a chemical reaction occurs.

---

5 what can be observed when (what happen if)

Unit 1

1- Hammering a piece of graphite

The piece of graphite crumbles easily because graphite is a brittle nonmetal (not malleable).

2- Increasing the number of valence electrons in metal atoms relative to the metallic bond

The metallic bond becomes stronger, and the metal becomes harder with a higher melting point.

3- Mixing molten gold with molten copper.

An alloy is formed whose properties differ from those of both metals.

4- Passing an electric current through sulphuric acid and acetic acid in relation to lighting a lamp

When the electric current passes in sulphuric acid solution the bulb becomes brighter, while when it passes in acetic acid solution the bulb becomes lower brightness

5- The reaction of acids with alkalis

A salt and water are formed.

6- Heat a piece of magnesium and add the result to water, then place a red litmus paper in the solution.

The red litmus paper will turn blue due to magnesium hydroxide solution $(Mg(OH)_2)$.

7- Melting sulphur oxides in rainwater
Sulphur trioxide (SO_3) is formed, which dissolves in water to produce sulphuric acid solution (H_2SO_4) causing acid rain

8- Place a piece of sugar in a test tube containing concentrated sulphuric acid.
The sugar becomes charred and black

9- Place a red and a blue sunflower paper in a tube containing hydrogen gas.
Both of them doesn't change in colour

10- Place a red and a blue sunflower paper in a tube containing chlorine gas.
The colour of both litmus strips (bleaches both of them).

11- Add calcium hydroxide to acidic soil.
To treat it from acidity and become suitable to planting

12- You dip two litmus strip in a cup containing an acidic solution.
The blue litmus strip change into red

13- You dip two litmus strip in a cup containing an alkaline solution.
The red litmus strip change into blue

14- You dip two litmus strip in a cup containing distilled water.
Both of them doesn't change in colour



15- Accumulation of lactic acid in muscles.
Muscle cramps occur.

16- Combustion of metal with oxygen.
The basic oxide will be formed

17- Combustion of non-metal with oxygen.
The acidic oxide will be formed

18- Melting of sulfur and nitrogen oxides in water vapor in the atmosphere.
This causes the precipitation of the acid rains.

Unit 2

19- Increasing in body weight relative to its potential energy.
The potential energy will increase

20- Decreasing in distance traveled during the same time.
The speed will decrease

21- Strong impact on an object with zero displacement.
The work done = zero because : $W = F \times d = F \times 0 = 0$

22- Vehicles exceed the permitted speed limits.
This results in increasing the road accidents.

23- A moving object covers the same distance it travelled in half the time (Regarding its speed).
The speed of the moving object doubles.

24- Exerting a suitable force on a stationary object (an object at rest).
The object moves for a certain displacement in the same direction of the force.

25- The force which affects an object increases in the direction of its movement (Regarding the work done).
The work increases.

26- The weight of an object is doubled while its height above the ground remains constant (Regarding its potential energy).
The potential energy doubles.

27- The vertical distance to which the object is lifted above the ground decreases to half while its weight remains constant (Regarding its potential energy).
The potential energy decreases to half.

---

6 Answer the following

Unit 1

1. What is the benefit of recycling metal waste?

1- Decreasing of their abundance (percentage) in the Earth's crust.

2- Difficulty of extracting them from their ores.

3- The lower cost of recycling them compared to extracting them from their ores.

2. Two elements (A, B) their melting points is (1538° C – 115. 21°C)

A- What type are they? Explain your answer.
Element (A) is a Metal (high melting point). Element (B) is a Non- metal (very low melting point).

B - Which one is a good conductor of electricity?
Element (A).

C - Which one can be hammered and drawn?
Element (A).



Unit 2

3. Calculate the time taken by a car moving at a speed of 40 m/s to cover a distance of 200 m

$$t = \frac{d}{v} = \frac{200}{40} = 5\ s$$

4. Calculate the height of an object of mass 6 kg above the ground when its potential energy is 180 J, knowing that the gravitational field intensity is 10 N/kg

$$w = m \times g = 6 \times 10 = 60\ N$$

$$h = \frac{PE}{w} = \frac{180}{60} = 3\ m$$

5. Calculate the speed of an object that covers distance of 50 km in 2 h.

$$v = \frac{d}{t} = \frac{50}{2} = 25\ km/h$$

6. Calculate the time required to cover a distance of 300 m if the object moves at a speed of 20 m/s.

$$t = \frac{d}{v} = \frac{300}{20} = 15\ s$$

7. A person pushes an object with a force of 40 N, causing it to move in a straight line for a distance of 10 m. Calculate the amount of work done.

$$w = f \times s = 40 \times 10 = 400\ j$$

8. Calculate the potential energy of an object with a mass of 15 kg at a height of 150 cm, given that the acceleration due to gravity is 10 m/s^2 .

$$PE = m \times g \times h = 15 \times 10 \times \left(\frac{150}{100}\right) = 225j$$

9. An object moves at a speed of 20 $km\ /h$. Calculate the distance traveled after 3h.

$$d = v \times t = 20 \times 3 = 60\ km$$

10. An object exerted a work of (50 J) to move a wheel a distance of (10 m). Calculate the amount of force required to exert the work.

$$F = \frac{Work}{distance} \qquad F = 50 \div 10 = \boxed{5\ \text{Newton}}$$

11. An object has a potential energy (240 J) at a height of (12 m). Calculate the weight of the object.

$$W = \frac{PE}{h} \qquad W = 240 \div 12 = \boxed{20\ \text{Newton}}$$

12. What factors determine potential energy?

weight (w) of the object and Height (h) above the ground



13. What is the relationship between work and both force and displacement?

Work is directly proportional to both force and displacement.

14. What mathematical relationship is used to calculate velocity?

$$V = \frac{d}{t}$$

15. What mathematical relationship is used to calculate work? $w = f \times s$

16. What mathematical relationship is used to calculate potential energy given weight?

$$PE = w \times h$$

17. What mathematical relationship is used to calculate potential energy given mass?

$$PE = m \times g \times h$$

18. What are the conditions for doing work?

- A force must be applied on the object
- The object must have a displacement in the same direction of the force

Unit 1

7 Write the chemical formula for the following compounds

	Name	Formula
1	Hydrochloric acid	HCl
2	Hydrobromic acid	HBr
3	Sulphuric acid	H_2SO_4
4	Phosphoric acid	H_3PO_4
5	Nitric acid	HNO_3
6	Potassium hydroxide	KOH
7	An atomic group consisting of three elements	HCO_3
8	Nitrous acid	HNO_2
9	Sodium chloride	$NaCl$
10	Calcium hydroxide	$Ca(OH)_2$
11	Aluminum sulfate	$Al_2(SO_4)_3$
12	Potassium nitrate	KNO_3
13	Sodium carbonate	Na_2CO_3
14	Magnesium oxide	MgO
15	Calcium phosphate	$Ca_3(PO_4)_2$
16	Iron (III) chloride	$FeCl_3$
17	Hydrogen sulfide	H_2S

18	Ammonium hydroxide	NH_4OH
19	Sulfuric acid	H_2SO_4
20	Sulfur dioxide	SO_2
21	Nitrogen monoxide	NO
22	Silver nitrate	$AgNO_3$
23	Sodium sulfide	Na_2S
24	Aluminum oxide	Al_2O_3
25	Sodium hydroxide	NaOH

8 What is the use(function) of each of the following

Unit 1

	Subject	Function / Use
1	Stomach acid	Helps in digestion of food
2	Litmus paper	Differentiates between acidic, alkaline and neutral substances
3	Graphite	Used in the manufacture of the dry cell
4	Bronze alloy	Used in the manufacture of jewellery, statues and medals
5	Recycling of elements	• Their percentages in the Earth's crust decreases • The difficulty of extracting them from their ores • The lower cost of recycling compared to extracting them from their ores
6	Lactic acid	Provides muscles with the necessary energy during their lack of oxygen during muscular effort
7	Magnesium milk	It is used as a temporary treatment to neutralize gastric hyperacidity
8	Sulfur and nitrogen oxides	Form acid rain
9	Acidic oxides	Form acids
10	Basic oxides	Form alkalis
11	Adding tin to copper	Bronze alloy formed
12	Adding calcium hydroxide to soil	A basic substance that treats the acidic soil
13	Universal guide	Provides an approximate measuring of the pH values for the solutions

14	pH meter	Determination of pH values for any solutions directly and accurately
15	Scientist Soren Sorensen	Developed the pH scale
16	Scientist Arrhenius	Classified the acid and alkali

9 Write the names of the following compounds and state their type

Unit 1

	Formula	Name	Type
1	H_2CO_3	Carbonic acid	Acid
2	H_2S	Hydrogen sulphide	Acid
3	H_3PO_4	Phosphoric acid	Acid
4	NaCl	Sodium chloride	Salt
5	$Ca(OH)_2$	Calcium hydroxide	Base
6	$Al_2(SO_4)_3$	Aluminum sulfate	Salt
7	KNO_3	Potassium nitrate	Salt
8	Na_2CO_3	Sodium carbonate	Salt
9	MgO	Magnesium oxide	Base
10	$Ca_3(PO_4)_2$	Calcium phosphate	Salt
11	H_2S	Hydrogen sulphide	Acid
12	NH_4OH	Ammonium hydroxide	Base
13	H_2SO_4	Sulfuric acid	Acid
14	HNO_3	Nitric acid	Acid

15	HCl	Hydrochloric acid	Acid
16	SO_2	Sulfur dioxide	Oxide
17	NO	Nitrogen monoxide	Oxide
18	$AgNO_3$	Silver nitrate	Salt
19	$CuSO_4$	Copper sulfate	Salt
20	Na_2S	Sodium sulfide	Salt
21	$NaHCO_3$	Sodium bicarbonate	Salt
22	Al_2O_3	Aluminum oxide	Base
23	$MgSO_4$	Magnesium sulfate	Salt

10 Give one example for each of the following, writing the molecular formula

Unit 1

	Term	Example	Formula
1	Weak acid	sulfurous acid	H_2SO_3
2	Strong acid	Sulfuric acid	H_2SO_4
3	Strong base	Sodium hydroxide	NaOH
4	Weak base	Ammonium hydroxide	NH_4OH
5	Metal oxide	Magnesium oxide	MgO
6	Non-metal oxide	Sulfur dioxide	SO_2
7	Gas that turns blue litmus red	Hydrochloric acid gas	HCl
8	Gas that turns red litmus blue	Ammonia gas	NH_3
9	Gas that has no effect on litmus	Oxygen	O_2
10	Chemical indicator that accurately measures pH	Universal indicator	pH meter
11	White salts	Sodium chloride	NaCl
12	Colored salt	Copper sulfate (blue)	$CuSO_4$
13	Salts that dissolve in water	Potassium nitrate	KNO_3

14	Salts poorly soluble in water	Calcium carbonate	$CaCO_3$
15	Metals	Copper	Cu
16	Non-metals	Sulphur	S
17	Alloys	Bronze	Cu + Sn
18	Acids	Nitric acid	HNO_3
19	Bases	Calcium hydroxide	$Ca(OH)_2$
20	Oxides	Aluminum oxide	Al_2O_3
21	Salts	Sodium carbonate	Na_2CO_3
22	Monovalent atomic group	Nitrate group	NO_3^-
23	Divalent atomic group	Sulfate group	SO_4^{2-}
24	Trivalent atomic group	Phosphate group	PO_4^{3-}
25	Oxyacid	Phosphoric acid	H_3PO_4
26	Non-oxygenic acid	Hydrochloric acid	HCl
27	Acid in your body	Hydrochloric acid (stomach)	HCl
28	Alkaline	Potassium hydroxide	KOH
29	Metallic oxide	Iron oxide	Fe_2O_3
30	Non-metallic oxide	Carbon dioxide	CO_2
31	Alkaline substance used as medicine	Magnesium hydroxide	$Mg(OH)_2$
32	Body that performs work	A moving car / falling object	—
33	Body that does not perform work	A stationary rock / wall	—

11 Choose the correct answer

Unit 1

1. All the following are properties of sodium element, except that it .....

Ⓐ is a metal. Ⓑ has metallic luster.
Ⓒ is a bad electrical conductor. Ⓓ is formable.

2. Which of the following is the correct arrangement of the hardness of sodium $_{11}Na$, magnesium $_{12}Mg$ and aluminum $_{13}Al$?

Ⓐ Na > Mg > Al Ⓑ Al > Mg > Na
Ⓒ Mg > Na > Al Ⓓ Al > Na > Mg

3. Element (X) its boiling point is 2807°C and its melting point is 1064°C Which of the following is a property of element (X)?

Ⓐ Bad electrical conductor. Ⓑ Brittle.
Ⓒ Formable. Ⓓ Opaque.

4. Which of the following questions helps in the classification of some elements to metals and nonmetals ?

Ⓐ Is it solid ? Ⓑ Is it liquid ?
Ⓒ Is it coloured ? Ⓓ Is it brittle?

5. What is the common property of both sodium and copper?

Ⓐ Colour. Ⓑ Density.
Ⓒ Melting point. Ⓓ Physical state.

6. If the anion which composes the acid HCIO is called hypochlorite, then the acid is called .....

Ⓐ hypochlorous acid. Ⓑ hypochloric acid.
Ⓒ perchloric acid. Ⓓ chlorous acid.

7. What is the ion whose percentage in the solution increases when an acidic oxide dissolves in water?

Ⓐ H^+ Ⓑ OH^- Ⓒ CI^- Ⓓ H^+

8. Element (X) forms the oxide XO which reacts with acids. Which of the following represents (X) and XO ?

Ⓐ (X): Metal, XO: Acidic oxide. Ⓑ (X): Nonmetal, XO: Acidic oxide.
Ⓒ (X): Metal, XO: Basic oxide. Ⓓ (X): Nonmetal, XO: Basic oxide.

9. On dissolving calcium oxide in water and placing two litmus strips in the solution , the colour of one of them changes into .....

Ⓐ red. Ⓑ purple. Ⓒ blue. D yellow.

10. Which of the following are properties of solid sodium hydroxide ?

Ⓐ It dissolves in water, and reacts with HCI acid.
Ⓑ It dissolves in water, and does not react with HCI acid.
Ⓒ It does not dissolve in water and does not react with HCI acid.
Ⓓ It does not dissolve in water and reacts with HCI acid.

11. A red litmus strip is placed in solution (1), so no change in colour occurs, when it is placed in solution (2), it becomes blue.

Which of the following is correct?

اللهم full mark من حيث لا نحتسب

Ⓐ Solution (1): Neutral , Solution (2): Acidic.
Ⓑ Solution (1): Acidic , Solution (2) Neutral.
Ⓒ Solution (1): Acidic , Solution (2) Alkaline.
Ⓓ Solution (1): Alkaline , Solution (2): Acidic.

12. The colour of the universal indicator is the same in both .....

Ⓐ tomato juice and hydrochloric acid.
Ⓑ distilled water and sodium chloride solution.
Ⓒ tomato juice and sodium hydroxide solution.
Ⓓ distilled water and hydrochloric acid.

13. All the following from ions that form salts, except .....

Ⓐ OH^- Ⓑ Cl^- Ⓒ NH_4^+ Ⓓ NO_3^-

14. All the following are properties of solid sodium carbonate salt, except that .....

Ⓐ it dissolves in water.
Ⓑ pH of its solution is higher than 7
Ⓒ its colour is white.
Ⓓ it conducts electricity.

15. pH value of a solution is changed from 8 to 5, that means it was .....

Ⓐ acidic and becomes alkaline.
Ⓑ acidic and becomes neutral.
Ⓒ alkaline and becomes neutral.
Ⓓ alkaline and becomes acidic.

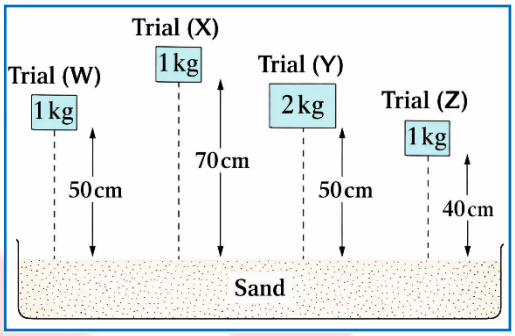
16. From the table :

Indicator	Colour change	pH at which colour change
(X)	Red ⟹ Yellow	4
(Y)	Yellow ⟹ Blue	6.4

What is the pH value of the solution which acquires yellow colour when drops of both (X) and (Y) are added to it?

Ⓐ 3 Ⓑ 5 Ⓒ 7 Ⓓ 10

17. The opposite figure represents an experiment that includes four trials (W) , (X) , (Y) and (Z):



Which of the following shows the controlled variable and the independent variable?

Choices	Trials	Controlled variable	Independent variable
A	(W) , (X)	Height	Mass
B	(W) , (Y)	Height	Mass
C	(X) , (Y)	Mass	Height
D	(X) , (Z)	Height	Mass

18. Which of the following cases involves doing work?

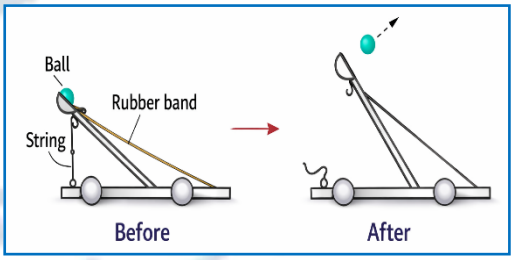


A Lifting a bag from the floor, pushing a shopping cart.
B Carrying a backpack while walking, pushing a shopping cart.
C Lifting a bag from the floor, pushing a tree.
D Carrying a backpack while walking, pushing a tree.

19. The potential energy of an object depends on .....

A its weight and speed.
B its weight and mass.
C its weight and height above the ground.
D its speed and height above the ground.

20. The opposite figure illustrates the motion of a ball after the slingshot string is cut :



Which of the following leads the ball to cover the maximum possible distance?

Choices	Change	As the stored potential energy in the rubber band is
A	Using a ball with a greater mass	Less before cutting the string
B	Using a longer rubber band	Greater before cutting the string

ⓒ	Using a shorter rubber band	Less before cutting the string
ⓓ	Using a shorter string	Greater before cutting the string

12 Define the following (what is meant by)

Unit 1

Metal	A substance in which the outermost energy level of the atom contains 1, 2 or 3 electrons.
Nonmetal	A substance in which the outermost energy level of the atom contains - mostly - 5, 6 or 7 electrons.
Metallic bond	The (electrostatic) attraction force between the positive metal ions and the negative valence electron cloud which surrounds them.
Alloy	A mixture composed of the melts of two or more metals.
Recycling	The process of the conversion of the wastes into new usable substances.
Atomic group	An ion composed of more than one atom of more than one element.
Acid	A substance whose dissolution in water (dissociation) increases the percentage of hydrogen cations (H^+) in the solution.
Alkali	A substance whose dissolution in water (dissociation) increases the percentage of hydroxide anions (OH^-) in the solution.
Basic oxides	Metal oxides, some of which dissolve in water forming alkalis.
Acidic oxides	Nonmetal oxides that dissolve in water forming acids.
Acid rains	Rain resulting from the dissolution of acidic oxides in atmospheric water vapour.
Indicators	Chemical substances whose colour differs in acidic medium from that in alkaline medium.

Universal indicator	An indicator that can differentiate between acids and alkalis Universal indicator or between different acids or different alkalis, based on their pH value Salts strength.
pH value	A scale ranging between the values 0 to 14, used to determine the acidity and the basicity of solutions.
Salts	✓ Ionic compounds formed by the combination of an alkali cation with an acid anion. ✓ Ionic compounds produced from the reactions of acids with alkalis.
Path of movement	A set of points that the object passes through its motion.
Distance (d)	The total length of any path taken by the object while moving from the starting point to the end point.
Displacement (s)	The shortest straight path connecting between the starting point and the end point in a constant direction.
Speed (v)	The distance covered per unit time.
Work (W)	The amount of energy required to move an object through a certain displacement in the same direction of the force which acts on it.
Controlling the variables	One of the skills in scientific researching and designing scientific comparative experiments.
Independent variable (Cause)	The variable which is changed during the experiment.
Dependent variable (Effect)	The variable to be tested, which is being changed in response to changing the independent variable.
Controlled variables	The variables that are controlled to remain constant throughout the experiment.
Energy (E)	The ability to do work.

Unit 2

Potential energy (PE)	The energy stored in an object as a result of the work done on i
The distance covered by an object equals 20 m	This means that the total length of the path taken by this object while moving from the starting point to the end point equals 20 m
The displacement of an object equals 10 m	This means that the length of the shortest straight path connecting between the starting point and the end point of this object in a constant direction equals 10 m
The speed of an object is 100 m/s	This means that this object covers a distance of 100 m in 1 second.
A moving car covers a distance of 20 km in 2 h	This means that the speed of this car equals 10 km/h $V = \frac{d}{t} = \frac{20}{2} = 10\ km/h$
The potential energy of an object is 20 J	This means that the energy stored in the object as a result of the work done on it is 20 J
An object with potential energy of 80 J is at a height of 10 m	This means that the weight of the object equals 8 N $W = \frac{PE}{h} = \frac{80}{10} = 8\ N$

13 compare between each of the following

Unit 1

1- Phosphorus - Iron

Property	Phosphorus (Non-metal)	Iron (Metal)
Metallic Luster	opaque (No luster)	Has a shiny metallic luster
Malleability and ductility	Not malleable and ductile	Malleable and ductile
Electrical Conductivity	Bad conductor	Good conductor

Melting point	Low	High

2- Sodium and graphite

Comparison Point	Sodium	Graphite
a) Metallic Luster	Have metallic luster (Shiny)	Do not have metallic luster (opaque)
Which is Opaque (Dull)?	Not opaque	Opaque

3- Sulphur and copper

Property	Sulfur	Copper
Malleability & Ductility	Non-malleable	malleable and ductile
Which is Brittle?	Brittle	Not brittle

4- Silver and phosphorus

Property	Silver (Metal)	Phosphorus (Non-metal)
Electrical Conductivity	Good electrical conductor	Bad electrical conductor

5- Metals and nonmetals

	Metals	Nonmetals
Electrons in the last energy level	Less than 4 electrons (1, 2 or 3 electrons)	More than 4 electrons (5, 6 or 7 electrons) Except for hydrogen 1 electron and carbon 4 electrons
Physical state	All of them are solids, except mercury element (liquid)	They are either solids or gases, except bromine element (liquid)
Metallic	They have metallic luster (shiny)	They do not have metallic luster

luster		(opaque)
Ductility, malleability formability	They are ductile, malleable and formable	They are not ductile, malleable or and (brittle)
Conductivity of heat and electricity	Good conductors of heat and electricity	Bad conductors of heat and electricity, except for graphite, which is a good conductor of electri
Melting points	High melting points	Low melting points
Examples	• Aluminum Al • Magnesium Mg • Lithium Li • Copper Cu • Zinc Zn • Silver Ag • Iron Fe • Calcium Ca • Potassium K •Mercury Hg	• Carbon (Graphite) C • Sulphur S • Phosphorus P • Bromine Br • Fluorine F • Oxygen O • Nitrogen N

6- Acid and alkali

	Acid	Alkali
Definition	A substance whose dissolution (dissociation) in water increases the percentage of hydrogen cations H^+ in the solution	A substance whose dissolution (dissociation) in water increases the percentage of hydroxide anions OH^- in the solution
Effect on litmus strips	Turns blue litmus strip to red	Turns red litmus strip to blue
Examples	• HCl • HNO_3 • H_2SO_4	• KOH • NaOH • NH_4OH

7- HCl and NaOH

	HCl	NaOH
Type of compound	Strong acid	Strong alkali
Result of each of the dissociation of each them	H^+ cations and Cl^- anions are formed	Na^+ cations and OH^- anions are formed
Effect of each of them on litmus strip	Turns blue litmus strip to red	Turns red litmus strip to blue

8- strong acids and weak acids

Strong acids	Weak acids
Acids that are good electrical conductors	Acids that are weak electrical conductors
Examples : ❖ Hydrochloric acid. ❖ Nitric acid. ❖ Sulphuric acid.	Examples : ❖ Vinegar (dilute acetic acid). ❖ Nitrous acid. ❖ Sulphurous acid.

9- Strong alkalis and weak alkalis

Strong alkalis	Weak alkalis
Alkalis that are good electrical conductors.	Alkalis that are weak electrical conductors.
Examples : Sodium hydroxide solution.	Examples : Ammonium hydroxide solution.

10- Basic oxides and Acidic oxides

	Basic oxides	Acidic oxides
Definition	Metal oxides, some of which dissolve in water forming alkalis	Nonmetal oxides that dissolve in water forming acids
The result of dissolving each of	Alkalis	Acids

them in water		
Examples	❖ Magnesium oxide MgO ❖ Calcium oxide CaO ❖ Sodium oxide Na_2O ❖ Potassium oxide K_2O	❖ Sulphur dioxide SO_2 ❖ Sulphur trioxide SO_3 ❖ Nitrogen dioxide NO_2 ❖ Carbon dioxide CO_2

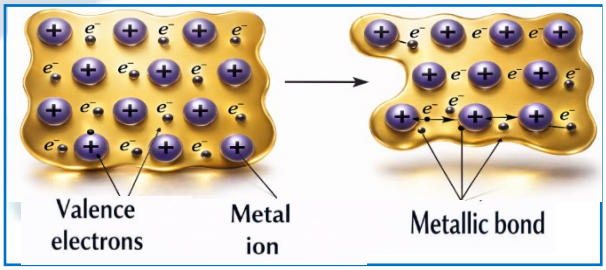
11- Ammonium chloride, Sodium chloride and Sodium carbonate solution

	Ammonium chloride solution	Sodium chloride solution	Sodium carbonate solution
pH of the solution	Less than 7	Equal to 7	Greater than 7
Type of solution	Acidic solution	Neutral solution	Alkaline solution
Effect on litmus strip	Changes the colour of blue litmus strip to red	Does not change the colours of red and blue litmus strips	Changes the colour of red litmus strip to blue
Electrical conductivity	Good electrical conductor		

14 Various questions

Unit 1

1. Look at picture then answer the following:



a- The metallic bond arises as a result from the force of attraction between the cations and the freely moving electrons surrounding negative cloud

b- The metallic bond is responsible for hardness metals and the high melting point of it.

c- The strength of the bond is proportional to both the degree of charge of the cation and the degree of number of free valence electrons.

2. Look at picture then answer the following:



- Humans usually use alloys in industry. Explain

alloys used in jewelers ,medals and statues

- Alloys are mixtures, most of which cannot be expressed in chemical formula

- Pure metals are soft while alloys are hard

- One of the most famous alloys, bronze alloy, it consists of tin at a rate of 5%, and copper with 95% .



- Recycling of metals

- This refers to the conversion of metal waste into new materials suitable for manufacturing new products.

- Among the most commonly recycled metals are aluminum, iron and copper

3. Look at picture then answer the following:



Hydrochloric acid (HCl) :

secreted by Stomach and helps in Digestion

Lactic acid : Provides Muscles with energy when there is a shortage of Oxygen

- **The accumulation of acid Lactic acid in the muscles causes Pain and muscles cramps**

4. Identify the damage caused by acid rain :



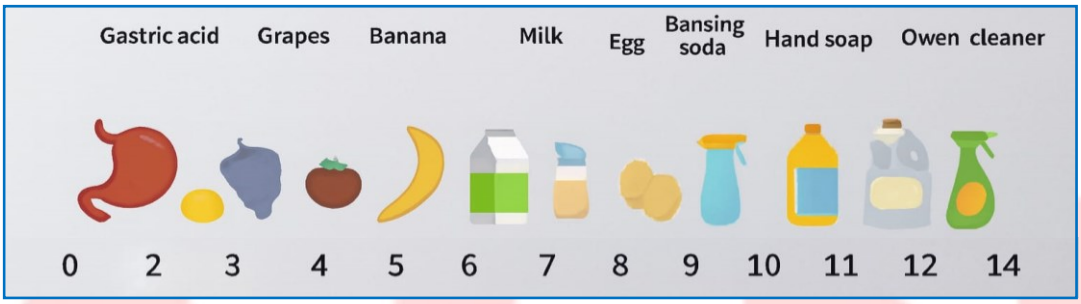
A) Destruction of forests.

B) Harming the aquatic organisms (which live in water).

c) Corrosion of buildings.

D) Health problems in the human respiratory system.

5. The value of the basic solution increases as the pH number approaches 14



a- Which substances are less acidic ? milk

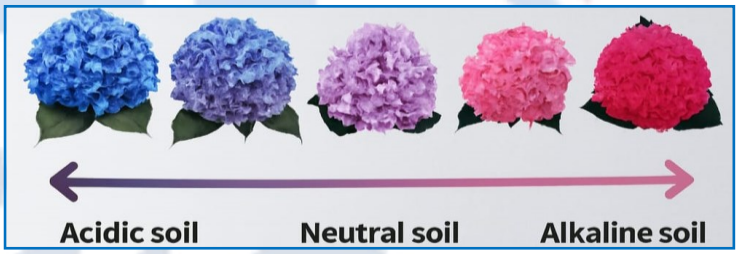
and which are more acidic ? gastric acid

b- Which substances are less basic ? egg

Which are more basic ? oven cleaner

c- The colour of hydrangea flowers varies, where:

- They turn red in alkaline soil, and blue in acidic soil.



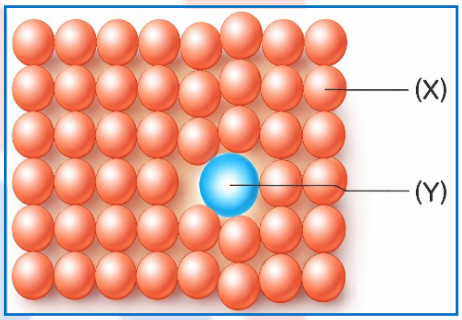
6. Physical properties of salts :

Salts differs from each other in :		
Color	White	Zinc sulphate $ZnSO_4$, Sodium carbonate Na_2CO_3
	Blue	Copper sulphate $CuSO_4$
	Green	Nickel chloride $NiCl_2$
Solubility in water	Soluble salt	All salts (Sodium - Potassium - Ammonium - Nitrate) Copper sulphate - Nickel chloride
	insoluble	All carbonate salts except (Sodium - Potassium - Ammonium) Silver chloride AgCl - Calcium carbonate $CaSO_4$
pH value	Acidity	Ammonium chloride NH_4Cl pH ≤ 7
	Alkalinity	Sodium carbonate solutionNa_2CO_3 pH ≥ 7
	Neutral	Sodium chloride NaCl pH $= 7$
Electricity	Solid salts don't conduct electricity	

	Salt solutions and its moltens are good conductors of electricity.

The salinity of dead sea is 10 times higher than that of the red sea, and therefore its density increase (no object can sink in it)

7. The opposite figure illustrates the composition of the bronze alloy:



(1) What are the elements (X) and (Y)?

- Element (X): Copper.
- Element (Y): Tin.

(2) Why are alloys preferred to be used more than the pure metals?

Because alloys are harder than pure metals, which tend to be soft and often unfit for the industrial uses and resistance to rust.

8. The table below shows the properties of 3 elements (a metal, a nonmetal and a metalloid) without order:

Element		Properties		
(X)	Solid at room temperature.	Shiny.	Brittle.	Heat conductor.
(Y)	Solid at room temperature.	Shiny.	Soft.	Electrical conductor.
(Z)	Solid at room temperature.	Opaque.	Brittle.	Bad electrical conductor

Identify the metal and the nonmetal of these elements, with explanation.

- ✓ Element (Y): Metal, as its properties are of those of metals.
- ✓ Element (Z): Nonmetal, as its properties are of those of nonmetals.

9. Can the type of potassium hydroxide solution be identified by using the blue litmus strip? Explain.

No / Because potassium hydroxide solution is an alkaline solution that does not change the colour of blue litmus strip.

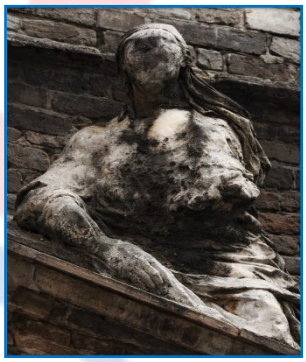
10. Element (X) oxide has the following properties:

- ❖ **It can react with acids.**
- ❖ **It does not react with alkalis.**

Is element (X) sulphur or copper? Explain.

Element (X) is copper / Because copper oxide is a basic oxide that reacts with acids and does not react with alkalis.

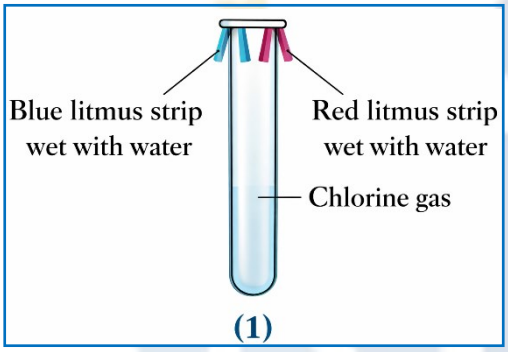
11. The opposite figures show the same statue left in open air for nearly 100 years :

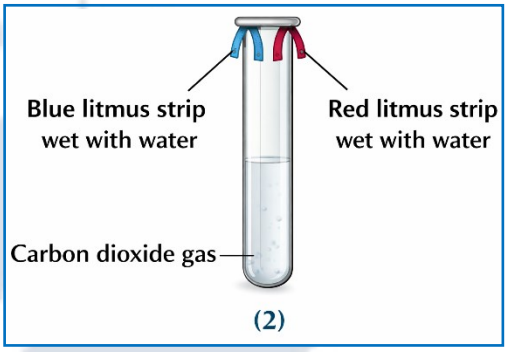



Why did the details of the statue disappear according to what you have studied?

Due to acid rains which result from the dissolution of acidic oxides in atmospheric water vapour.

12. What happens to the colours of the litmus strips in the following cases?





- ❖ **In case of tube (1): Chlorine gas removes the colour of the two litmus strips.**
- ❖ **In case of tube (2): The blue litmus strip turns red.**

13. Acidity of the soil varies from one place to another:

(1) How can acidic soil be treated?

Acidic soil is treated by adding basic substances to it, such as calcium hydroxide $Ca(OH)_2$

(2) What is the colour of Hydrangea flowers which grow in acidic soil?

The flowers acquire blue colour.

22. Write the molecular formulas of the salts composed from the following cations and anions:

(1) K^+ , PO_4^{3-} **(2) $A1^{3+}$, SO_4^{2-}**

(3) NH_4^+ , NO_3^- (4) Mg^{2+} , CO_3^{2-}

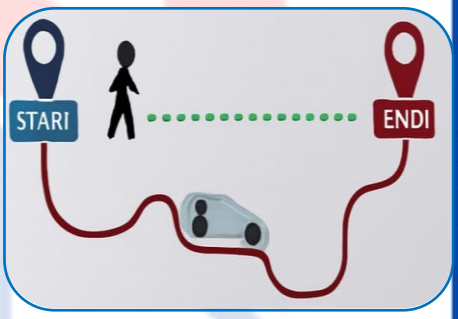
Answers:

(1) K_3PO_4 (2) $Al_2(SO_4)_3$

(3) NH_4NO_3 (4) $MgCO_3$

Unit 2

14. Distance or Displacement :

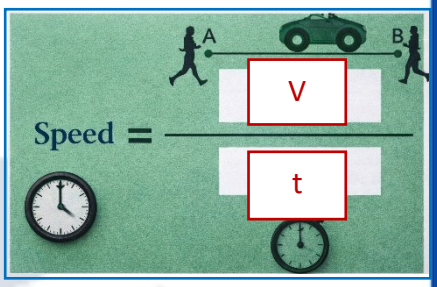


- The path taken by the car represents distance

- The path taken by the person represents displacement

- The measuring unit for the physical quantity represented by the path of the car is m , cm or km

15. Complete the figure :



- Speed is defined as the distance covered per unit time

Speed is measured in units of m/s or km/h

- Calculate the speed of an object that covers distance of 10m in a time of 5s.

Speed = distances ÷ time = 10/5=2 m/s

- When is the distance covered equal to the displacement ?

if move in straight line in one direction

- When is the speed equal to the distance covered ? if time equal 1 second

16. Look at the two pictures.



2



1

-Which one shows work being done?

(Explain your answer.)

Figure 1 /because the wheelbarrow move in same direction of force

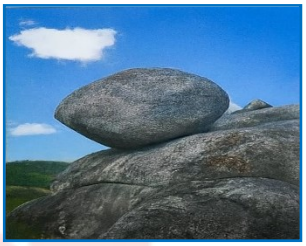
- Work is the amount of energy required to move an object through a certain displacement in the same direction of the force which acts on it. and is symbolized

by W and its measuring unit is joule

- The work mathematical relationship =force ✖ displacement

- Energy is The ability to do work. and its measuring unit is joule

- What are the similarities between the static rock on top of the hill and the static ball on the playground?

The static rock and static ball Both are at rest

17. From the forms of the potential energy:

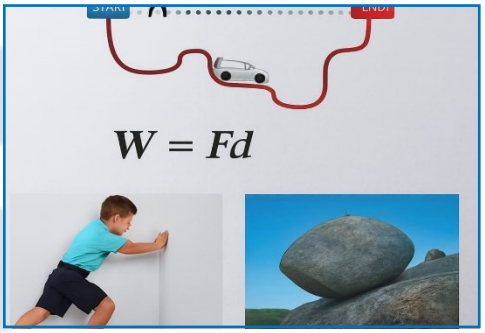
1- Gravitational potential energy like a rock on top of a hill / a ball held at a height

2- Elastic potential energy like a compressed spring / a stretched rubber

3- Chemical potential energy like food / fuel / batteries

18. Explain why the potential energy differs in the two cases shown in the figure.

The potential energy differs because the height of the ball is different in the two cases.



- The ball held at a greater height has higher potential energy
- The ball held at a lower height has lower potential energy

19. The value of potential energy can be obtained from the mathematical relationship

P.E = m × g × h

20. What happens when the weight of the ball increases?

the potential energy increases

