Questions

Unit (1)

(1) Complete the following:

1) Nitrogen pentoxide breaks up into …….. and …….. gas.
2) At the beginning of the reaction, the concentration of reactants is ……...
3) The speed of a chemical reaction can be measured practically by the rate of …….. of reactants or the rate of …….. of resultants.
4) The change in the concentration of reactants and resultants in a time unit is ……...
5) The rate of chemical reaction depends on ……..., ……..., ……..and ……...
6) The reaction of covalent "contributing" compounds is ……...
7) The increase in concentration of reactants makes the chemical reaction ……...
8) A substance which increases the chemical reaction without sharing in the reaction is ……...
9) $2NaOH + CuSO_4 \rightarrow$ …….. + ……..
10) $Fe + 2HCl \rightarrow$ …….. + ……..
11) $2N_2O_5 \rightarrow$ …….. + ……..

(2) Give reasons for:

1) The speed of chemical reaction increases when the amount of the reactants (concentration) increases.
2) Food must be heated during its preparation.
3) Food goes rotten in summer days if it is not frozen.

(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

(4) Mention the function of:

1- refrigerator 2- Enzymes

(5) Give reason for:

- The rheostat are used in the electric circuit.

(6) Define:

- Ohm's law

(7) What's meant by:

- A work of 10 joules is done to transfer a charge of 5 coulombs between two points.

(8) Solve: If the quantity of electricity of 12 coulombs passes through a cross-section of a conductor in 3 seconds, what is the intensity of the current passing through that conductor?

Unit (2)

(1) Complete:

1- The current intensity due to the flow of 2700 coulomb in 300 second through a cross-section of a conductor equals ……

2- In the electric circuits, the ammeter is connected in ……, while the voltmeter is connected in ……

3- Volt = $\frac{\text{joule}}{\ldots\ldots\ldots\ldots \times \text{second}}$

4- There are two types of electric current which are …… and ……

5- The …… electric current can be transported only to short distance.

6- There are two methods of connecting electric cells which are …… and ……

7- ……, …… and cesium are natural radioactive elements.

8- Nuclear energy is used in medicine in …… and …… of some diseases.

(2) Write the scientific terms:

1- The flow of electric negative charges in a conducting material (metal wire). (……)

2- A device used to measure the electric current intensity. (……)

3- The work done to transfer unit of electric charge between two ends of a conductor. (……)

4- The opposition to the flow of electric current in the conductor. (……)

5- The potential difference across the two poles of the battery when the circuit is opened. (……)

6- The electric current of constant intensity and direction.

(……)

7- A type of connection of electric cells used to obtain high e.m.f.

(……)

8- The process of conversion of atoms of some elements to reach more stability. (……)

(3) Choose the correct answer:

1- Electrons are …… charged particles.

a) positively b) neutral

c) negatively d) no correct answer

2- …… is the measuring unit of the electric charges.

a) coulomb b) Ampere

c) volt d) no correct answer

3- …… is used to measure the e.m.f of a battery.

a) Voltmeter b) Ammeter c) Rheostat d) ohmmeter

4- …… is the measuring unit of electric resistance.

a) ohm b) ampere c) volt d) coulomb

5- As the length of rheostat wire increases, the current intensity ……

a) increases b) decreases

c) constant d) there is no answer

6- Direct current can be produced from ……

a) electrochemical cells b) electric generators

c) electric power stations d) electric motors

7- In the simple cell the …… energy is converted into electric energy.

a) kinetic b) magnetic c) chemical d) mechanical

8- In dynamo, …… energy is converted into electric energy.

a) magnetic b) kinetic c) chemical d) light

9- Alternating current is used in ……

a) electrolysis b) lighting house

c) electroplating d) both a & c

10- Radioactive phenomenon was discovered by the scientist ……

a) ohm b) Becquerel c) Ampere d) volt

11- Rockets use …… fuel for flying

a) gasoline b) kerosene c) natural gas d) nuclear

12- The measuring unit of the absorbed radiation is the ……

a) curie b) rem c) Rontgen d) ohm

(4) Give reasons for:

1- It is better to use alternating current rather than direct current.

2- The voltmeter is connected across the two poles of a battery.

3- Rheostat is used in some electric circuits.

4- Some cells are connected in electric circuit in series.

5- Some cells are connected in the electric circuit in parallel.

6- e.m.f. of battery whose cells are connected in series is greater than that connected in parallel.

7- Some elements are called radioactive elements.

8- Radiation has genetic effect.

(5) Problems:

1- Calculate the electric current intensity that flows through cross section of a wire, if a charge of 10 coulombs passes through in 2 seconds.

2- Calculate the current intensity due to the flow of 5400 coulomb in 5 min. through a cross-section of a conductor.

3- What is the quantity of electricity which passes through a conductor its resistance 100 ohm for 30 minutes when the potential difference across its ends is 220 volts.

4- You have three similar cells, the electromotive force of each is 1.5 volt. Explain by using a diagram how you can connect them to obtain an e.m.f of:

a) 1.5 volts b) 3 volts c) 4.5 volts

Unit (3, 4)

(1) Complete:

1- ……... traits are not transmitted from one generation to another.

2- The scientist ……... is the founder of heredity, he used the seeds of ……... plant, because its flowers are ……... and thus it can self-pollinated.

3- The trait that appears in all individuals of the first generation in Mendel's experiments is ……... trait.

4- Chromosome is chemically composed of a nucleic acid called ……... which is combined with ……...

5- The two scientists ……... and ……... were able to make a model for DNA molecule.

6- Hormones are directly secreted into the blood stream by ……..

7- ……... gland secretes ……... hormone which controls the general growth of the body.

8- ……... hormone regulates food assimilation in your body.

(2) Write the scientific term:

1- The traits ready to be transmitted from one generation to another.
(……)

2- The trait that appears in all individuals of the first generation in Mendel's experiments. (……)

3- The hereditary factors which transmit traits from the parents to off spring. (……)

4- Through it, the hereditary traits are transmitted from parents to offspring. (……)

5- Parts of DNA that are present on the chromosomes and carry the hereditary traits of the individual. (……)

6- It is chemically consisted of a nucleic acid called DNA combined with protein. (……)

7- Organs secreting hormones in the human body. (……)

8- A chemical message that controls and regulates the activities and functions of most of the body organs. (……)

9- Hormone which stimulates the storage of glucose sugar level in the blood. (……)

10- The result when one of the endocrine glands does not act properly. (……)

(3) Choose the correct answers:

1- Mendel conducted his experiments in pea plant by using …….. pairs of traits.

a) 5 b) 7 c) 9 d) 11

2- The two factors of a hereditary trait are similar in the …….. individual.

a) pure b) hybrid c) recessive d) a and c

3- Which one of these traits is recessive in humans ……..

a) curly hair b) wide eyes c) free ear lobe d) straight hair

4- …….. put the model of DNA molecule.

a) ohm b) Mendel c) Watson d) Johansson

5- …….. is the part of DNA in the cell nucleus.

a) Gene b) Gamete

c) Cytoplasm d) no correct answer

6- DNA molecule consists of …….. strands.

a) two b) three c) four d) five

7- The …….. mice don't have melanin pigment.

a) grey b) white c) black d) brown

8- The hormone which regulates the level of calcium in the blood is the …….. hormone.

a) calcitonin b) thyroxin c) progesterone d) adrenalin

9- The …….. hormone liberates the needed energy from the food stuff.

a) growth b) estrogen

c) thyroxin d) testosterone

10- Glucagon hormone is secreted by ……..

a) pituitary gland b) thyroid gland

c) adrenal gland d) pancreas

(4) Give reasons for:

1- Mendel selected (choose) the pea plant to conduct his experiments.

2- The curly hair dominates the smooth hair trait.

3- The ability of rolling the tongue is dominant trait in the human being.

4- DNA molecule is called the double helix.

5- Blood stream is the only way for hormones to reach their sites of action.

6- Pituitary gland is called the master gland.

7- The stopping of the body growth, so the person becomes a dwarf.

8- Pancreas is a double function gland.

9- Diabetes disease is treated with insulin hormone.

(5) Problems:

1- In pea plant, what are the results of self-pollination of tall hybrid plant pure, by using the symbols (T, t) showing (parents – gametes – offspring).

2- Using symbols to express the results of mating between a short stem pea plant (tt) and a long stem pea plant (TT)

3- If a black mouse BB is crossed to a brown female mouse (bb) mention the colours and the ratios of resulting offspring in the first generation and second generation illustrated on hereditary basis.

4- When a pea plant that has tall stem is crossed with a pea plant that has short stem, this crossing produced individuals with the ratio of 50% tall : 50 % short what is the genetic structure of parents and producing individuals (use “T” for tall “t” for short)

Model Answers

(1) Complete the following:

1) Nitrogen pentoxide breaks up into **nitrogen dioxide** and **oxygen** gas.
2) At the beginning of the reaction, the concentration of reactants is **100%** .
3) The speed of a chemical reaction can be measured practically by the rate of **disappearance** of reactants or the rate of **appearance** of resultants.
4) The change in the concentration of reactants and resultants in a time unit is **the rate of chemical reaction**.
5) The rate of chemical reaction depends on **temperature**, **catalysts**, **concentration of reactants** and **nature of reactants**.
6) The reaction of covalent "contributing" compounds is **slow**.
7) The increase in concentration of reactants makes the chemical reaction **faster**.
8) A substance which increases the chemical reaction without sharing in the reaction is **catalyst**.
9) $2NaOH + CuSO_4 \rightarrow \underline{Na_2SO_4} + \underline{Cu(OH)_2}\downarrow$
10) $Fe + 2HCl \rightarrow \underline{FeCl_2} + \underline{H_2}\uparrow$
11) $2N_2O_5 \rightarrow \underline{4NO_2} + \underline{O_2}\uparrow$

(2) Give reasons for:

1) The speed of chemical reaction increases when the amount of the reactants (concentration) increases.
Due to the increase in the number of collision between molecules.
2) Food must be heated during its preparation.
To increase the speed of chemical reaction which help in cooking of food.
3) Food goes rotten in summer days if it is not frozen.
Due to the increase of the speed of chemical reaction done by bacteria.

(3) How can you differentiate between:

Sodium chloride solution and sodium hydroxide solution (by two different methods)

The first method: by adding silver nitrate solution if white ppt. is formed.

∴ the solution is sodium chloride:

$NaCl + AgNO_3 \rightarrow NaNO_3 + AgCl \downarrow$ white ppt

The second method: by adding copper sulphate solution if blue ppt is formed.

∴ the solution is sodium hydroxide:

$2NaOH + CuSO_4 \rightarrow Na_2SO_4 + Cu(OH)_2 \downarrow$

(4) Mention the function of:

1- refrigerator : preservation of food

2- Enzymes : they control digestion of food

(5) Give reason for:

- The rheostat are used in the electric circuit.

To control the electric current intensity flowing through the circuit.

(6) Define:

Ohm's law: the electric current intensity passing through a conductor is directly proportional to the potential difference across it at constant temperature.

(7) What's meant by:

- This means that the potential difference across the two points equals 10 / 5 = 2 volt

(8) $I = \frac{q}{t} = \frac{12}{3} = 4$ amperes.

Unit (2)

(1) Complete:

1- 9 Ampere.

2- series, parallel

3- volt = $\frac{\text{joule}}{\text{ampere} \times \text{second}}$

4- direct – alternating

5- direct

6- series – parallel

7- radium, uranium

8- treat & diagnose diseases

(2) Write the scientific terms:

1- electric current

2- Ammeter

3- potential difference

4- resistance

5- e.m.f

6- direct electric current

7- series connection

8- radioactivity

(3)

1 – (c)	2 – (a)	3 – (a)	4 – (a)
5 – (b)	6 – (a)	7 – (c)	8 – (b)
9 – (b)	10 – (b)	11 – (d)	12 – (b)

(4) Give reasons for:

1- Because it can be transferred to long distances & can be converted to direct current.

2- To measure e.m.f. of battery.

3- To control the current intensity passing through the circuit & potential difference by changing the resistance.

4- To obtain high e.m.f

5- To obtain low e.m.f.

6- Because the total e.m.f. for a group of cells connecting in series is equal to the sum of the e.m.f for these cells, while the total e.m.f for a group of cells connecting in parallel is equal to the e.m.f of one cell.

7- Because their nucleus contain number of neutrons more than that required for its stability.

8- Because it changes sex chromosomes composition results in abnormal birth.

(5)

1) $q = 10$ coulmbs $\quad t = 2$ sec.

$$I = \frac{q}{t} = \frac{10}{2} = 5 \text{ Ampere .}$$

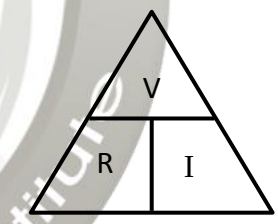
2) $= 5400$ colomb $\quad t = 5 \times 60 = 300$ sec .

$$I = \frac{q}{t} = \frac{5400}{300} = 18 \text{ Ampere .}$$

3) $R = 100$ ohm $\quad , t = 30 \times 60 = 180$ sec.

$$, \ V = 220 \text{ v} \ , \ R = \frac{V}{I} \ , \ I = \frac{V}{R}$$

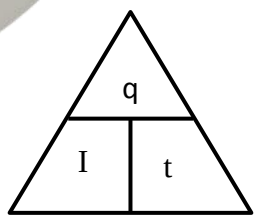
$$\therefore I = \frac{220}{100} = 2.2 \text{ Ampere .}$$



$\because q = I \times t$

$= 2.2 \times 1800$

$= 3960$ coulomb .



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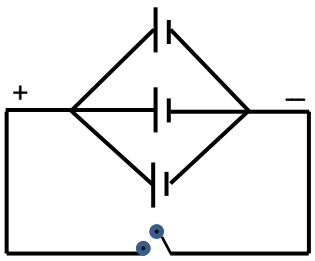
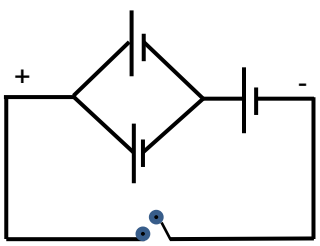
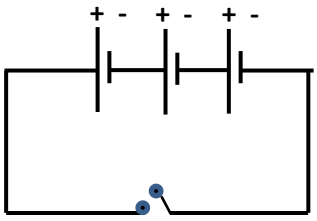






(Unit 3 , 4)

(1)

1 – Acquired .

2 – Mendel , Pea plant , hermaphodite .

3 – Dominant .

4 – DNA , protien .

5 – Watson & creck .

6 – endocrine glands .

7 – Pituitary – growth .

8 – Thyroxine.

(2)

1 – Hereditary traits .

2 – Dominant trait .

3 – genes .

4 – hereditany factor (genes).

5 – genes .

6 – chromosomes .

7 – endocrine glands .

8 – hormone .

9– Insulin .

10 – hormone disorder .

(3)

1 – 7

2 – a & C

3 – straight hair .

5 – Watson

6 – Gene

7 – two

8 – white

9 – (a)

10 – (c)

11 – (d)

(4) Give reasons for:

1- Mendel selected (choose) the pea plant to conduct his experiments.

- **It is easy to be planted & grows fast.**
- **Its life cycle is short.**
- **The flowers are hermaphrodite.**
- **It is easy to be artificially pollinated.**
- **Produces huge no. of offspring.**
- **Has several contrasting traits.**

2- The curly hair dominates the smooth hair trait.

- **The gene of the Curly hair dominate over the gene of smooth hair.**

3- The ability of rolling the tongue is dominant trait in the human being.

- **The gene of the ability of rolling the tongue dominate the other gene.**

4- DNA molecule is called the double helix.

- **It is formed of 2 strands.**

5- Blood stream is the only way for hormones to reach their sites of action.

- **Because the endocrine glands are located a way from the target organ.**

6- Pituitary gland is called the master gland.

- **It controls all glands in the body & their activities.**

7- The stopping of the body growth, so the person becomes a dwarf.

- **Due the decreasing in the secretion of growth hormones.**

8- Pancreas is a double function gland.

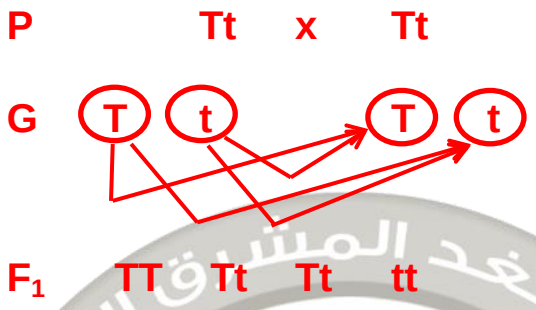
- **It secretes hormone to regulate the glucose level in the blood & enzymes to help in the digestion of food.**

9- Diabetes disease is treated with insulin hormone.

- **To decrease the glucose level in the blood by activating the cells to absorb the glucose or store it in the form of glycogen in the liver.**

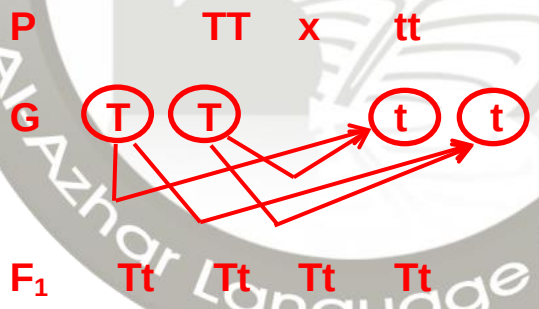
(5) Problems:

1- In pea plant, what are the results of self-pollination of tall hybrid plant pure, by using the symbols (T, t) showing (parents – gametes – offspring).



*** Ratio 3 tall : 1 short .**

2- Using symbols to express the results of mating between a short stem pea plant (tt) and a long stem pea plant (TT)



*** 100% of the first generation tall (hybrid)**

3- If a black mouse BB is crossed to a brown female mouse (bb) mention the colours and the ratios of resulting offspring in the first generation and second generation illustrated on hereditary basis.

P_1 BB x b b

G_1 B b

F_1 Bb

*** All F_1 black (hybrid)**

P_2 Bb x Bb

G_2 B b B b

F_2 BB Bb Bb bb

*** F_2 3 black : 1 brown.**

4- When a pea plant that has tall stem is crossed with a pea plant that has short stem, this crossing produced individuals with the ratio of 50% tall : 50 % short what is the genetic structure of parents and producing individuals (use “T” for tall “t” for short)

P_1 Tt x tt

G_1 T t t t

F_1 Tt Tt tt tt

*** 50% tall (hybrid) : 50% short recessive**

GOOD LUCK