Prime

FINAL REVISION

Prep 3

SCIENCE

2025

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Prep 3 Science

Vision & Objectives of the Revision

تهدف المراجعة إلى تطوير ثلاث مهارات أساسية لدى الطالب، وهي:

1.تنمية الثروة اللغوية العلمية:

التي تؤثر في كفائة الطالب عند الاجابه علي أسئلة مثل

- *Complete*
- *scientific term*
- *give reasons*
- وغيره من الأسئلة

من خلال الجزء الخاص بأهم كلمات المنهج في بداية المراجعه ← يجب حفظها جيداً

2.مراجعة شاملة ومركزة للمنهج:

يتضمن الجزء الثاني من المراجعة ملخصًا شاملًا يغطي جميع جوانب المنهج، بالإضافة إلى كبسولة التعريفات و أسئلة (*Give Reasons – What Happens if*...)، مما يساعد الطالب على استرجاع كل جزئية بسهولة.

3.التدريب على جميع أنواع الأسئلة وطريقة حلها:

ترتيب الأسئلة في المراجعة تدريجيًا من الأسهل إلى الأصعب، مع ربط الأسئلة المتشابهة في المعلومات تباعاً لأستكمال استحضار المنهج في ذهن الطالب بنظام، وتشجيع الطالب على الاستمرار في الحل دون الشعور بالإحباط عند مواجهة الأسئلة الصعبة.

تم إعداد هذه المراجعة بعناية ومحبة، إيمانًا بأن كل طالب قادر على التميز إذا أُعطي الفرصة والدعم المناسب. اجتهد، ثق بنفسك، وابدأ طريق التفوق بثبات.

مع خالص تمنياتي بالنجاح

Mr. Salah Khalil


Full
Summary

Part 1

The most important words

The word	الترجمة
chemical reactions	التفاعلات الكيميائية
car engine	محرك السيارة
generate	يُولِّد
medicine	دواء
fertilizers	أسمدة
artificial fibers	ألياف صناعية
breaking up	تفكك
bond	رابطة
reactants	المواد المتفاعلة
products (resultants)	النواتج
thermal decomposition	التحلل الحراري
extinguish	يُطفئ
substitution reactions	تفاعلات الإحلال
activity series	سلسلة النشاط الكيميائي
pop sound	صوت فرقعة
copper turning	برادة النحاس
dilute	مُخفف
magnesium ribbon	شريط المغنيسيوم
neutralization	التعادل
limewater	ماء الجير
precipitate (ppt.)	راسب
oxidation	أكسدة
reduction	اختزال
oxidizing agent	عامل مؤكسد
reducing agent	عامل مختزل
percentage	نسبة مئوية
take away	يُزيل
concurrent	متزامن
fireworks	الألعاب النارية
caustic soda	الصودا الكاوية
rusting of iron	صدأ الحديد
concentration	تركيز
disappearance	اختفاء
appearance	ظهور
covalent compounds	مركبات تساهمية
molecules	جزيئات

The word	الترجمة
ionic compounds	مركبات أيونية
surface area	المساحة السطحية
collision	تصادم
concentrated	مُركَّز
bubbles	فقاعات
effervescence	فوران
effervescent tablet	قرص فوّار
catalyst	عامل حفاز
enzyme	إنزيم
electric current	التيار الكهربائي
current intensity	شدة التيار
potential difference	فرق الجهد
electric resistance	المقاومة الكهربائية
electromotive force (EMF)	القوة الدافعة الكهربائية
series connection	توصيل على التوالي
parallel connection	توصيل على التوازي
direct current (DC)	التيار المستمر
alternating current (AC)	التيار المتردد
unidirection	أحادي الاتجاه
electroplating	الطلاء بالكهرباء
radioactivity	النشاط الإشعاعي
nuclear reactions	التفاعلات النووية
isotopes	نظائر
spontaneous conversion	تحول تلقائي
cosmic radiation	إشعاع كوني
nuclear bomb	قنبلة نووية
bone marrow	نخاع العظام
spleen	الطحال
nausea	غثيان
precautions	احتياطات
genetics	الوراثة
heredity	الوراثة
hereditary traits	الصفات الوراثية
generation	جيل
offspring	نسل
asexual reproduction	التكاثر اللاجنسي
sexual reproduction	التكاثر الجنسي

تم تحميل هذه الأوراق مجانًا من
أكبر وأضخم مكتبة تعليمية
موقع وتطبيق مذكرات جاهزة

The word	الترجمة
mating	تزاوج
acquired traits	صفات مكتسبة
hermaphrodite	خنثى
self pollination	تلقيح ذاتي
principle of dominance	مبدأ السيادة الوراثية
inheritance	الوراثة
genes	الجينات
gametes	الأمشاج
dominant	سائد
recessive	متنحٍ
pure dominant	سائد نقي
hybrid	هجين
law of segregation	قانون انعزال العوامل الوراثية
nucleotides	النيوكليوتيدات
double helix	الحلزون المزدوج
hormone	هرمون
endocrine glands	الغدد الصماء
pituitary gland	الغدة النخامية
thyroid gland	الغدة الدرقية
adrenal gland	الغدة الكظرية
growth hormone	هرمون النمو
gigantism	العملقة
dwarfism	القزامة
diabetes	السكري
genetic engineering	الهندسة الوراثية
human genome project	مشروع الجينوم البشري

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Part 2

Full summary

Chemical Reactions

Chemical Reactions

- A process that breaks bonds in reactants and forms new bonds in products.

Importance of Chemical Reactions in Daily Life

1. Burning of car fuel (gasoline) : Produces energy to move the car.
2. Photosynthesis in plants : Carbon dioxide reacts with water to form food.
3. Manufacturing of medicines, fertilizers, and artificial fibers.

Types of Chemical Reactions

1 Thermal Decomposition Reactions

These occur when heat breaks down compounds into simpler substances.

Subtypes of Thermal Decomposition:

1 Metal Oxides → Metal + Oxygen gas

Example:

$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

Mercuric oxide (red colour) → Mercury (silver colour) + Oxygen

Observation: → Silver precipitate and glowing match.

2 Metal Hydroxides → Metal Oxide + Water Vapor

Example:

$Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$

Copper hydroxide (blue colour) → Copper oxide (black colour) + Water vapour

Observation: → Black substance forms.

3 Metal Carbonates → Metal Oxide + CO_2

Example:

$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$

Copper carbonate (green colour) → Copper oxide (black colour) + Carbon dioxide

Observation: → Black substance + limewater turns turbid.

4 Metal Sulphates → Metal Oxide + SO_3

Example:

$CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

Copper sulphate (blue colour) → Copper oxide (black colour) + Sulphur trioxide

Observation: → Black substance forms.

5 Metal Nitrates → Metal Nitrite + O_2

Example:

$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

Sodium nitrate (white colour) → Sodium nitrite (yellowish white colour) + Oxygen

Observation: → Yellowish-white substance + glowing match.

Chemical Reaction in Car Air Bags

Reaction: $2NaN_3 \xrightarrow{\text{Electric spark}} 2Na + 3N_2\uparrow$

Sodium azid → Sodium + Nitrogen gas

Nitrogen gas inflates the airbag instantly for safety.

2 Substitution Reactions

An active element replaces a less active one in a compound.

Chemical Activity Series (C.A.S.)

- Lists metals by reactivity
- (ex: K > Na > Ca > Al > Zn > Fe > Pb > H > Cu > Ag > Au)

Types of Substitution Reactions

1 Simple Substitution Reactions

A. Metal replaces hydrogen in water

- Only active metals above hydrogen in C.A.S. do this.

Example:

$2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$

Sodium + Water → Sodium hydroxide + Hydrogen

Observation: Pop sound, water becomes warm.

B. Metal replaces hydrogen in diluted acid

- Metals above hydrogen in C.A.S. react with acids.

Example:

$Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

Zinc + Hydrochloric acid → Zinc chloride + Hydrogen

$2Al + 6HCl \xrightarrow{dil.} 2AlCl_3 + 3H_2\uparrow$

Aluminium + Hydrochloric acid → Aluminium chloride + Hydrogen

$Cu + HCl \xrightarrow{dil.}$ No reaction

Copper + Hydrochloric acid

NOTES

- Aluminium reacts **slower than** zinc in acid → due to an oxide layer (Al_2O_3).
- Sodium reacts with HCl, but copper does not, since sodium is more reactive than hydrogen, while copper is less reactive.

C. Metal Substitutes Another Metal in Salt Solution

- More active metals can replace less active metals from their salt solutions (based on C.A.S.).

Example:

$$\underset{\text{Magnesium}}{Mg} + \underset{\substack{\text{Copper sulphate}\\\text{(blue colour)}}}{CuSO_4} \longrightarrow \underset{\substack{\text{Magnesium sulphate}\\\text{(colourless)}}}{MgSO_4} + \underset{\substack{\text{Copper}\\\text{(red ppt.)}}}{Cu\downarrow}$$

- Magnesium replaces copper because it's higher in the activity series.

NOTES

1. Magnesium can replace copper, but copper cannot replace magnesium.
2. **Don't** store silver nitrate in aluminum containers: aluminum will react and erode.
3. Substitution happens faster when the gap between metals in C.A.S. is larger.
4. Potassium reacts quickly with water; magnesium reacts slowly (K is more active than Mg).

2 Double Substitution Reactions

- Two compounds exchange parts (ions) to form two new compounds.

Types

1.Acid + Alkali → Salt + Water (Neutralization)

- Example:

$$\underset{\text{Sodium hydroxide}}{NaOH} + \underset{\text{Hydrochloric acid}}{HCl} \longrightarrow \underset{\text{Sodium chloride}}{NaCl} + \underset{\text{Water}}{H_2O}$$

2.Acid + Salt

- Reaction depends on the types used.

$$\underset{\text{Sodium carbonate}}{Na_2CO_3} + \underset{\text{Hydrochloric acid}}{2HCl} \xrightarrow{\text{dil.}} \underset{\text{Sodium chloride}}{2NaCl} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbon dioxide}}{CO_2\uparrow}$$

3.Salt + Salt

- Produces precipitate (a solid that doesn't dissolve).

Example:

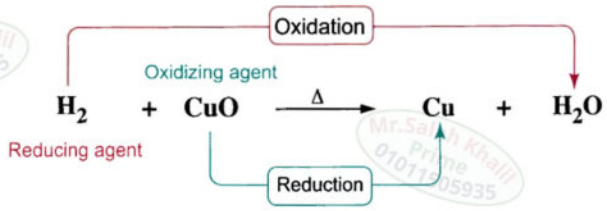
$$\underset{\text{Sodium chloride}}{NaCl} + \underset{\text{Silver nitrate}}{AgNO_3} \longrightarrow \underset{\text{Sodium nitrate}}{NaNO_3} + \underset{\substack{\text{Silver chloride}\\\text{(white ppt.)}}}{AgCl\downarrow}$$

1 Oxidation & Reduction Reactions

1. Traditional Concept (Oxygen/Hydrogen Based)

Example:

- Copper oxide + Hydrogen → Copper + Water



- Hydrogen: Oxidized (combines with oxygen) → Reducing Agent
- Copper oxide: Reduced (loses oxygen) → Oxidizing Agent

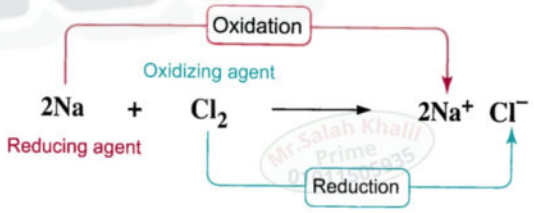
Key Definitions:

1. Oxidation: Gain of oxygen / Loss of hydrogen
2. Reduction: Loss of oxygen / Gain of hydrogen
3. Reducing agent: Takes oxygen / Gives hydrogen
4. Oxidizing agent: Gives oxygen / Takes hydrogen

2. Electronic Concept (Electrons Based)

Example:

- Sodium + Chlorine → Sodium chloride



- Sodium: Loses electron → Oxidized → Reducing Agent
- Chlorine: Gains electron → Reduced → Oxidizing Agent

Key Definitions:

1. Oxidation: Atom loses electrons
2. Reduction: Atom gains electrons
3. Reducing agent: Loses electrons
4. Oxidizing agent: Gains electrons

NOTES

- Oxidation and reduction always happen together.
- Metals = strong reducing agents (lose electrons).
- Nonmetals = strong oxidizing agents (gain electrons).

Reducing Agent	Oxidizing Agent
1. Goes through oxidation	1. Goes through reduction
2. Gives electrons	2. Gains electrons
3. Gives hydrogen	3. Takes hydrogen
4. Unites with oxygen	4. Gives oxygen

Speed (Rate) of Chemical Reactions

What is Speed of Chemical Reactions?

- It refers to how fast a chemical reaction takes place.
- It depends on how quickly reactants change into products.

Types of Chemical Reactions by Speed:

Type	Time Needed	Example
Very Fast	Very short time	Fireworks
Relatively Slow	Short time	Oil + NaOH → Soap
Very Slow	Several months	Rusting of iron
Too Slow	Millions of years	Petroleum formation

Concept of Reaction Speed

- **Reactants (X):** Start at 100%, decrease over time.
- **Products (Y):** Start at 0%, increase over time.
- **Graph:** Shows concentrations over time.
- **Speed :** Change in concentration of reactants or products per unit time.

Understanding Graphs in Reactions

- **Graph Example ($2X \rightarrow 2Y + Z$):**
  - X = Reactant (starts high, ends at 0)
  - Y = Product (more amount)
  - Z = Product (less amount)
- **Another Graph ($2A + B \rightarrow 2C$):**
  - A and B are reactants.
  - A starts double B.
  - C is the only product formed.

Example: Decomposition of N_2O_5

Equation: $2N_2O_5 \rightarrow 4NO_2 + O_2$

- At start : N_2O_5 is high / NO_2 and O_2 are 0.
- Over time: N_2O_5 drops (decrease), NO_2 and O_2 increase.
- Final: N_2O_5 = **0**, NO_2 and O_2 = **100%**

Measuring Reaction Speed Practically

1. Disappearance of reactant.
2. Appearance of product.

Example:

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

(blue colour solution) (blue colour ppt.)

Speed measured by:

- how fast blue color disappears or how fast precipitate forms)

Factors Affecting Reaction Speed

1. Nature of Reactants

- **Ionic Compounds:** Fast (react through ions, dissociate in water).
- **Covalent Compounds:** Slow (react through molecules, do not easily dissociate).

2. Surface Area of Reactants

Form	Speed
Big solid piece	Slow (small exposed surface)
Powder / Filings	Fast (large exposed surface)

Experiment:

- Iron filings react ***faster*** with HCl than iron pieces.
- Equation: $Fe + 2HCl \rightarrow FeCl_2 + H_2$

3. Concentration of Reactants

- **Higher concentration** → More collisions → Faster reaction

Experiment:

- Mg ribbon with **conc. HCl** → more bubbles (faster)
- Mg ribbon with **dil. HCl** → fewer bubbles (slower)

Equation: $Mg + 2HCl \rightarrow MgCl_2 + H_2$

General Rules

- More Surface Area → Faster Reaction →use nickel filings instead of blocks)
- More Concentration → Faster Reaction →combustion in pure oxygen is faster than in air)

4. Temperature of the Reaction

- When the temperature increases → the speed of reactant molecules increases.
- This leads to more frequent collisions, increasing the reaction speed.

NOTES

- Fridge slows reactions, preserving food by slowing down bacterial reactions.
- Cooking food faster needs higher temperature

5. Catalysts

A catalyst : is a substance that changes the reaction speed without changing itself.

Types of Catalytic Reactions:

1. Positive catalyst: Increases the speed
2. Negative catalyst: Decreases the speed

(Positive catalysts are more common)

Common Properties of Catalysts

1. Change speed, not start/stop of the reaction
2. Needed in small amounts
3. Don't get used up
4. Lower energy needed for reaction
5. No mass or chemical change at the end

Activity – Effect of a Catalyst

Materials: Hydrogen peroxide + MnO_2 (manganese dioxide)

Observation: More bubbles when MnO_2 is added

Conclusion: MnO_2 increases reaction speed (acts as a catalyst)

Enzymes

- Special biological catalysts made in the body (ex : saliva, stomach).
- Speed up biological reactions by millions of times.
- Without enzymes, basic life activities can't happen.

Activity – Effect of Enzymes

Materials: Hydrogen peroxide + sweet potato

Observation: More bubbles after adding sweet potato

Conclusion: The enzyme (oxidase) in sweet potato increases speed of decomposition of hydrogen peroxide.

Science, Technology, and Society

Catalytic Converter in Cars

- Found in modern cars to treat harmful gases from engines.
- **Structure**: Made of ceramic cells with a layer of catalytic metal (platinum, palladium, or iridium).
- **Function:**
  a. Increases surface area for reaction
  b. Speeds up treatment of gases using catalysts

Uses of Sodium Bicarbonate in Life

A. In the Home:

1. In vacuum cleaner bag → Removes bad smell
2. In trash can → Prevents bad odors
3. In kitchen sink + hot water → Improves drainage
4. Soaking legumes → Reduces bloating

B. In Polishing Metals:

5. Clean silver with boiling water & aluminum foil
6. Clean copper/chrome using cloth + baking soda

C. In the Garden:

- Sprinkle where ants appear → Ants disappear over time

Radioactivity and Nuclear Energy

Atomic Structure Basics

- All elements are made of atoms.
- An atom has a nucleus with protons and neutrons.
- Electrons move around the nucleus in energy levels.
- The nucleus contains almost all the atom's mass.
- Chemical reactions involve electrons, while nuclear reactions involve changes in the nucleus.

G.R: The atom's mass is concentrated in the nucleus

- because electrons have negligible mass.

Nuclear Energy

- Nuclear energy is stored in the nucleus of an atom.
- It comes from nuclear binding forces that:
  - Bind protons and neutrons together.
  - Overcome the repulsion between positively charged protons.

G.R.: The nuclei of stable atoms remain intact despite internal repulsive forces

- due to strong nuclear binding forces.

Peaceful Uses of Nuclear Energy

1. Medical : Treat diseases like cancer.
2. Agricultural : Kill pests, improve crops.
3. Industrial : Make silicon sheets for electronics, detect defects.
4. Electricity generation : Heat water → steam → turbine → electricity.
5. Space exploration : Rocket fuel.
6. Drilling : Find underground water and petroleum.

Radioactivity

Discovery of Radioactivity

- Discovered by Henri Becquerel in 1896.
- He noticed invisible rays emitted from uranium that could penetrate solid objects.

What is Radioactivity?

- Some atoms have extra neutrons → unstable nuclei → **excess energy**.
- These unstable atoms are **called radioactive elements.**
- Their nuclei automatically emit radiation (alpha, beta, gamma) to become more stable.

Examples of radioactive elements:

- Radium, Uranium, Polonium, Cesium, Rubidium, Zirconium, Selenium

NOTES

- If the number of neutrons in an atom's nucleus increases too much:
  - The nucleus becomes unstable and emits radiation.
- **Uranium is radioactive** → because its nucleus has more neutrons than needed for stability.
- Uranium-238: 146 neutrons + 92 protons = unstable nucleus.

Artificial Radioactivity

- Happens during nuclear reactions in reactors or bombs.

Types:

- **Controlled:** In nuclear reactors → for safe uses.
- **Uncontrolled:** In nuclear bombs → for military uses.

Radiation Pollution

- Increase of radiation in the environment.

Sources of radiation pollution:

- **Natural:** Earth's radioactive materials, cosmic radiation.
- **Artificial:** Nuclear bomb tests, nuclear reactors.

Example: Chernobyl Disaster

- Date: April 26, 1986.
- Cause: Operational error.
- **Result:**
  - Explosion released radioactive elements.
  - Polluted clouds spread across Europe.
  - Rain brought radiation to Earth's surface.
  - Polluted plants → animals → milk/meat became radioactive.

Polluted food after Chernobyl contained:

1. Iodine isotopes
2. Cesium isotopes
3. Produced from nuclear fuel decay (Uranium-235).

Isotopes

- Atoms of the same element with the **same number of protons** but **different neutrons.**

Radiation Effects on the Human Body

Group 1: Short exposure to high dose (1 day or less)

- **Damages:** Spleen, digestive system, nervous system, bone marrow.
- **Result:** Decrease in red blood cells → weakness, nausea, vomiting, diarrhea.

Group 2: Long exposure to small dose (months/years)

1. **Physical effects:** Skin cancer.
2. **Genetic effects:** Birth defects from damaged chromosomes.
3. **Cellular effects:** Cells lose function (e.g. hemoglobin can't carry oxygen).

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Measuring Radiation

- Unit: Sievert (SV)
- 1 milli Sievert = 10^{-3} Sievert

Safe dose:

- Radiologists: 20 milli SV/year
- Public: 1 milli SV/year

Depends on:

- Person's age
- Time of exposure
- Body part exposed

Protection from Radiation Pollution

1. Workers should wear protective gear (gloves, clothes, masks).
2. Waste precautions:
   - Keep away from water sources.
   - Store in steady areas (not earthquake zones).
3. Waste burial:
   - **Mild:** surrounded by cement/rocks.
   - **Strong:** buried deep underground.
4. Laws: Cool hot water from stations before releasing into lakes/seas.

NOTES

- Radiation pollution can spread without a nuclear explosion via rain and wind.
- Nuclear explosions (in bombs or reactors) cause long-term environmental contamination, lasting hundreds of years.

Physical Properties of the Electric Current

Importance of Electric Current in Daily Life

1. Electric current is used to light houses, factories, and streets.
2. It is used to operate machines like radios, televisions, washing machines, electric heaters, etc.

(Electric energy is the cleanest energy because it doesn't pollute the environment)

The Electric Circuit

Components and Their Functions:

Component	Role (Function)
Electric Lamp	Shows flow of electric current
Electric Key	Opens and closes the circuit
Connecting Wire	Connects the parts of the circuit
Electric Cell	Source of electric current (1 unit)
Electric Battery	Source of electric current (multi-cell)

NOTES

- Two parallel lines on a dry cell:
  - Tall line = positive pole
  - Short line = negative pole

Closed vs Open Circuit

- Closed Circuit: All parts connected → Lamp lights up.
- Open Circuit: Circuit is broken → Lamp does not light up.

Electric Current Source

- Electric current is generated **in power stations** and transmitted over long distances to homes.

How is Electric Current Generated?

- Every atom has:
  - Electrons (negative, orbit the nucleus)
  - Nucleus with:
    - Protons (positive)
    - Neutrons (neutral)
- Metals have weak attraction between electrons and protons, making it easier for electrons to move.

→ **This movement creates electric current.**

Electric Current Definition:

- The flow of negative electric charges (electrons) through a conducting material (metal wire).

G.R.

- The atom is electrically neutral → Protons = Electrons.
- The nucleus is positively charged → Contains protons and neutrons.

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Physical Properties of Electric Current

1 Current Intensity (I)

It is the quantity of electricity (in coulomb) that passes through a section of a conductor in 1 second.

- **Formula: I = q ÷ t**
  - I = Current Intensity
  - q = Quantity of Charge (Coulomb)
  - t = Time (Seconds)
- **Units:**
  - Current Intensity → Ampere (A)
  - Quantity of Charge → Coulomb (C)
  - Time → Second (s)

➤ 1 Ampere = 1 Coulomb / 1 Second

Relation between :

→ Charge , Time , and Current Intensity:

Situation	Result
Charge doubles, time same	Current doubles
Time doubles, charge same	Current halves
Charge doubles, time halves	Current increases 4×

➤ Conclusion:

- Directly proportional **to charge** (when time is constant)
- Inversely proportional **to time** (when charge is constant)

The Ammeter Apparatus

- **Use:** Measures current intensity in the circuit.
- **Symbol:** A
- **Connection:** In series
  - Positive pole of ammeter (red) → Positive dry cell pole
  - Negative pole (black) → Negative dry cell pole

NOTES

Never connect ammeter directly to battery → it may get damaged.

Technology Application: UPS (Uninterrupted Power Supply)

- Stores electric energy.
- Keeps devices working during power cut.

2 Electric Potential Difference

Definition:

- It shows the flow of electricity from one conductor to another.
- Depends on difference in electric potential (like temperature difference in heat transfer).

Analogy:

- Heat flows from hot → cold.
- Electricity flows from high potential (A) → low potential (B).

(If two conductors have same potential, no current flows)

Potential Difference Across Two Terminals:

It is the work done to transfer 1 coulomb of charge between two points.

Formula:

- V=W ÷ q
  - V = Potential Difference
  - W = Work (Joule)
  - q = Charge (Coulomb)

Units:

- Volt (V) = 1 Joule / 1 Coulomb

Relationships of V, W, and q

If:

- **Work done decreases** → Potential difference decreases.
- **Charge decreases** → Potential difference increases.
- **Work increases and charge decreases** → Potential difference increases greatly.

Conclusion on Potential Difference

- Directly proportional to work done (W) if charge is constant.
- Inversely proportional to charge (q) if work is constant.

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Electromotive Force (e.m.f)

- The potential difference across the battery terminals when the circuit is open → **no current flows .**
- **Unit** = Volt (V)

Voltmeter

- **Used for:**
  - Measuring potential difference
  - Measuring e.m.f of a battery
- **Connected in:** Parallel
- **Symbol:** V
- **Polarity:**
  - Red pole → Positive terminal
  - Black pole → Negative terminal

NOTES

If Voltmeter connected in :

- **Closed Circuit:** Measures potential difference across a component (e.g., lamp)
- **Open Circuit:** Measures e.m.f. of the dry cell

3 Electric Resistance (R)

- Opposition that current faces in a conductor
- **Measured by:** Ohmmeter
- **Unit:** Ohm (Ω)

Types of Resistance

- **Fixed** Resistance → Constant value
- **Variable** Resistance (Rheostat) → Adjustable value

Variable Resistance (Sliding Rheostat)

- **Structure:**
  a. Metallic wire coil (porcelain cylinder)
  b. Copper bar
  c. Sliding copper sheet (adjusts resistance)
- **Connection:** Between terminals (A) and (C)
- **Note :**
  - Longer wire → More resistance → Less current
  - Shorter wire → Less resistance → More current

Ohm's Law

Law: **V** = R x I

- **V** = potential difference
- I = current intensity
- R = resistance

Graph:

- A straight line showing direct relation between **V** and I

Definition Based on Ohm's Law

Ohm

- Resistance that allows 1 A to pass when **V** = 1 V

Ampere

- Current that passes through 1 Ω when **V** = 1 V

Volt

- Potential difference across 1 Ω when 1 A passes through

Important Cases

- Burning resistance → Ammeter reads zero, voltmeter still works
- Double **V** (constant temp) → I also doubles
- Double R (constant **V**) → I becomes half

Electric Symbols (Basic)

(Cell - Battery - Fixed resistor - Variable resistor - Closed switch / Open switch - Light bulb - Voltmeter - Ammeter)

Ampere

- Current intensity through a conductor with 1 ohm resistance and 1 volt potential difference.

Resistance of a conductor:

- Ratio between potential difference and current.

Summary of Physical Quantities & Units

1. Potential Difference → Volt →V
2. Current Intensity → Ampere → I
3. Resistance → Ohm → R
4. Work → Joule → W
5. Quantity of Charge → Coulomb → q
6. Time → Second → t

Match Units with Quantities

الأقواس مهمه للترتيب الرياضي الصحيح

1. Joule ÷ (Volt x Second) → Current Intensity (I)
2. Volt x Second ÷ Ohm → Quantity of Charge (q)
3. Joule ÷ (Ampere x Second) → Potential Difference (V)
4. Volt x Ampere x Second → Work (W)
5. Volt x Second ÷ Coulomb → Resistance (R)

Electric Current and Cells

What is Electric Current?

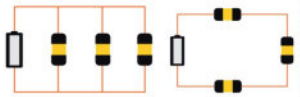
- It is the flow of electric charges in a circuit.
- It plays an important role in our daily life.

Sources of Electric Current

1. **Electrochemical Cells**
   - Convert chemical energy → electric energy
   - Example: dry cells, batteries
   - Produce direct current (DC)
2. **Electric Generators (Dynamos)**
   - Convert mechanical (kinetic) energy → electric energy
   - Example: dynamo
   - Produce alternating current (AC)

Measuring Electromotive Force (e.m.f.)

- Use a **Voltmeter**:
  - **In series:** e.m.f. adds up.
    - Ex: 1.5V + 1.5V = 3V
  - **In parallel:** e.m.f. remains the same.
    - Ex: 1.5V + 1.5V = 1.5V



Guidelines for Solving e.m.f. Problems

1. All cells in series → Add all voltages.
2. All cells in parallel → Use one cell's voltage.
3. For mixed connections → Add series + parallel e.m.f.
4. Use diagrams to determine the type of connection.

Example Problem :

A battery of 3 cells, each with e.m.f = 3V.

- **Series** connection: E = 3 × 3 = 9V
- **Parallel** connection: E = 3V

Property	Direct Current (DC)	Alternating Current (AC)
Source	Electrochemical cells	Electric generators (dynamos)
Intensity	Constant	Variable
Direction	Unidirectional (one direction only)	Changes direction many times (cycle)
Transference	Short distances only	Long & short distances
Change to other	Cannot be converted to AC	Can be converted to DC
Uses	Electroplating, small appliances	Lighting, home appliances
Graph Shape	Straight horizontal line	Wavy curve (sinusoidal)

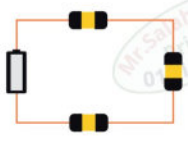
Connecting Cells in Electric Circuits

→ A group of connected cells = **Battery**

→ Two connection methods:

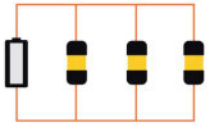
1. Series Connection

- Different poles are connected (+ to -)
- Total e.m.f. = sum of all cells' e.m.f.
- Used to get **high** e.m.f.
- Formula: $E(battery) = n \times E_1$



2. Parallel Connection

- Same poles are connected together
- Total e.m.f. = e.m.f. of one cell
- Used to get **low** e.m.f.
- Formula: $E(battery) = E_1$



Battery Connection and e.m.f (Electromotive Force)

- If you have 3 dry cells, each of e.m.f = 3 volt:
  - You can form different values of total e.m.f by connecting them in various ways:

1. To get the **highest** e.m.f → Connect all cells in *series*
   → **Total e.m.f = 3 × 3 = 9 volt**
2. To get **e.m.f = 6 volt** → Connect two cells in *parallel*, and then connect them in series with the third one
   → **Total e.m.f = 3 + 3 = 6 volt**
3. To get the **lowest** e.m.f → Connect *all three cells in parallel*
   → **Total e.m.f = 3 volt**

Question:

- If total e.m.f = 3 + 3 + 1.5 = 7.5 volt, and resistance = 30 ohm

→ Current intensity = V / R = 7.5 / 30 = 0.25 ampere

NOTES

- In series: e.m.f = n × E_1 → *higher voltage*
- In parallel: e.m.f = E_1 only
- More e.m.f → higher current intensity → brighter light
- Lemon produces electric current to light the lamp.
- As e.m.f increases, electric current intensity increases.

The Main Principles of Heredity

Types of Traits:

(1- Hereditary Traits)

Passed from one generation to another through genes

Examples of Hereditary Traits:

- Hair and skin colour
- Blood groups
- Number of fingers

(2- Acquired Traits)

Not inherited , learned or gained from the environment

Examples of Acquired Traits:

- Speaking languages
- Swimming
- Walking

Genetics

- studies the similarities and differences between parents and offspring and how traits are transferred.

Important Points from Last Year:

Hermaphrodite flower

- Has both male and female organs

Self-pollination

- Pollen moves to stigma of the same flower or another flower on the same plant

Mixed-pollination

- Pollen moves to a flower on another plant

Mendel – The Founder of Heredity

- Gregor Mendel was the first to study heredity through experiments on pea plants.

Why did Mendel choose pea plants?

1. Grows easily and fast
2. Short life cycle
3. Has both male and female parts (hermaphrodite)
4. Can be artificially pollinated
5. Produces many plants
6. Has clear contrasting traits

Mendel studied 7 traits:

Trait	Characteristics
Flower colour	Red / White
Flower position	Side / End
Seed colour	Yellow / Green
Seed shape	Smooth / Wrinkled
Stem height	Tall / Short
Pod colour	Green / Yellow
Pod shape	Swollen / Sinuous

Mendel's Experiments – Step by Step

First Step – Test Pure Traits

- Self-pollination of pure yellow and pure green seed plants for many generations.

Result:

Yellow gives only yellow - green gives only green → *traits are pure.*

Second Step – Prevent Self-pollination

- Stamens removed to stop self-pollination.

Third Step – Cross-pollination

- Pollen from green plant → yellow plant, and vice versa.
- Covered pistils after pollination to stop another cross.

Result (First Generation):

- All plants had yellow seeds (100%)
- Green disappeared → yellow is dominant , green is recessive

Fourth Step – Let First Generation Self-pollinate

Result (Second Generation):

- 75% yellow seeds
- 25% green seeds

Ratio: Yellow : Green = 3 : 1

→ Green trait reappears = **recessive**

Complete Dominance Principle

- Dominant trait appears even if it is mixed with a recessive one.
- Green appears only when both genes are green (recessive).

(General Rule)

- On mating a yellow seed plant with a green one, all first generation plants are yellow due to complete dominance.

Mendel's First Law – Law of Segregation of Factors

- Traits are controlled by pairs of factors.
- These factors separate during gamete formation and combine again at fertilization.
- Ratio of **second generation** = 3 dominant : 1 recessive

Pure individual

- Has two similar genes (either dominant or recessive)

Hybrid individual

- Has two different genes (one dominant, one recessive)

Mendel's Assumptions

No.	Assumption	Top of Mountain
1	Traits are passed by hereditary factors in gametes	Pollen grains and ovules carry traits
2	Each trait is controlled by two factors (one from each parent)	Yellow and green for seed colour
3	The two factors separate during formation of gametes	Each gamete carries one factor
4	Factors combine during fertilization	If same: pure trait. If different: dominant trait appears

Homozygous vs Heterozygous

No.	Assumption	Top of Mountain
Dominant + Dominant	Pure dominant	Pure individual
Recessive + Recessive	Pure recessive	Pure individual
Dominant + Recessive	Impure dominant	Hybrid individual

Dominant vs Recessive Traits

Point	Dominant Trait	Recessive Trait
Definition	Appears with two dominant or one dominant + one recessive	Appears only with two recessive
Example	Yellow seed	Green seed
Appearance	100% in 1st gen , 75% in 2nd	Disappears in 1st , 25% in 2nd
Purity	Pure or impure	Always pure

Dominant trait:

- Represented by a **capital letter** (ex: T for tall stem).

Recessive trait:

- Represented by a **small letter** (ex: t for short stem).

Genetic Structures:

- Pure dominant: Two capital letters (ex: TT).
- Recessive: Two small letters (ex: tt).
- Hybrid (impure dominant): One capital, one small (ex: Tt).

Symbols Used in Heredity:

Term	Symbol	Term	Symbol
Male	♂	Parents	P
Female	♀	Gametes	G
Mating	×	First Generation	F_1

Stem Height in Pea Plants

- Tall stem gene = T (dominant)
- Short stem gene = t (recessive)

(Pure tall → TT / Hybrid tall → Tt / Short → tt)

Genetic Crosses: Key Exercises & Ratios

Exercise 1: Yellow (YY) x Green (yy) seeds

- F1: All Yy (100% yellow hybrid)
- F2: 75% yellow (YY, Yy), 25% green (yy)

Exercise 2: Tall (TT) x Short (tt)

- F1: All Tt (100% tall hybrid)

Exercise 3: Red (Rr) x White (rr) flowers

- F1: 50% red hybrid (Rr), 50% white (rr)

Exercise 4: Green pod hybrids (Gg x Gg)

- F2: 75% green (GG, Gg), 25% yellow (gg)

Exercise 5:

Two Traits Cross (Dihybrid Cross)

TTGG (tall stem & green pod) x ttgg (short stem & yellow pod)

- F1: All TtGg (100% tall stem, green pod - hybrid)
- F2 (self-pollinate):
  - Ratio:
    - 9 Tall stem, Green pods
    - 3 Tall stem, Yellow pods
    - 3 Short stem, Green pods
    - 1 Short stem, Yellow pods

Exercise 6: Inheritance of Two Pairs (Red flowers & Tall stem)

TTRR (tall, red) x ttrr (short, white)

- F1: All TtRr (tall, red - 100% hybrid)
- F2:
  - Phenotypic ratio (based on traits):
    - 9 Tall & Red
    - 3 Tall & White
    - 3 Short & Red
    - 1 Short & White
  - Each individual trait has a **3:1** ratio (Dominant : Recessive)

Dominant and Recessive Human Trait

Trait	Dominant	Recessive
Tongue rolling	Can roll tongue	Can't roll tongue
Ear lobe	Free	Attached
Hair nature	Curly (H)	Smooth (h)
Hair colour	Black	Light
Eye size	Wide	Narrow
Eye colour	Brown	Blue/Green/Grey
Dimples	Present	Absent
Freckles	Absent	Present

Summary of Mendel's Laws

1. Law of Dominance

- Dominant gene masks recessive one in hybrid.

2. Law of Segregation

- Each trait is controlled by a pair of factors which segregate during gamete formation.

3. Law of Independent Assortment

- Traits are inherited independently. In dihybrid crosses, traits follow 9:3:3:1 ratio in F2 generation.

DNA, Genes, and Heredity

The Chemical Structure of Nucleic Acid (DNA)

- Chromosomes are found inside the nucleus of the cell.
- Chromosomes are made of:
  - DNA (nucleic acid) + protein
- DNA carries hereditary (genetic) traits.

DNA Structure:

- DNA is made of genes.
- Genes are parts of DNA that control traits.
- Genes are made of smaller parts called nucleotides.

Watson and Crick Model

- Watson and Crick built a model of DNA.
- DNA has two strands twisted in a double helix shape.

How Genes Work

- **Badel** and **Tatum** found how genes control traits.
- Every gene gives an enzyme.
- The enzyme causes a chemical reaction.
- The reaction produces a protein.
- The protein → shows a specific hereditary trait.

(Mechanism Summary)

→ Gene → gives Enzyme → causes Chemical Reaction → makes Protein → shows Hereditary Trait

Applications

1. Brown Eyes Trait (Dominant):

- Inherited from a parent.
- Gene gives enzyme → causes reaction → protein shows brown eyes.

2. Black Hair Trait (Dominant):

- Same process: gene → enzyme → protein → black hair.

Science, Technology, and Society

→ Genetic Engineering (Biotechnology)

- Used in medicine and agriculture.
- Helps in creating **genetically modified rice**.

Genetically Modified Rice

Problem:

- In poor countries, 500,000+ people lose sight yearly due to Vitamin A deficiency.
- **Normal rice** doesn't have Pro-vitamin A (carotene).

Solution:

- Insert genes into rice to produce carotene, which turns into Vitamin A in the body.
- This rice is called ***Golden Rice.***

Scientific Basis:

- Modify rice genes to **make Pro-vitamin A** inside starch tissues in rice grains.

Life Application: The Human Genome Project

What is the Human Genome?

- A complete genetic map showing all human genes on chromosomes.

Aims of the Project

1. Identify all human genes and their functions.
2. Discover genes linked to diseases (cancer, diabetes, etc.).
3. Understand how mutations affect genes.
4. Find genetic differences between individuals.

Results of the Project

- Humans are *99% similar in DNA*.
- Small differences like :
  - Eye color
  - Skin color
  - Height, etc.
- These small differences affect how people respond to:
  - Bacteria, viruses, chemicals
  - Medicines and treatments

Hormones in the Human Body

What are Hormones?

- Hormones are **chemical substances** secreted by special cells.
- They help **organize and control** many activities and functions in living organisms.
- Hormones are produced by **endocrine glands** (ductless glands).
- They are transported by the blood **to target cells** (cells affected by hormones).

Endocrine Glands

- Endocrine glands secrete hormones ***directly*** into the blood.

Examples of endocrine glands:

1. Pituitary gland
2. Thyroid gland
3. Two adrenal glands
4. Pancreas gland
5. Reproductive glands (testes in males, ovaries in females)

(1) Pituitary Gland – "The Master Gland"

- Location: Below the brain
- Structure: Two lobes
- Importance: Controls other endocrine glands
- Hormones it secretes:
  - Growth hormone
  - TSH (Thyroid Stimulating Hormone)
  - Hormones for adrenal glands, mammary glands, kidneys, sex organs, and childbirth

Growth Hormone Disorders

- **Dwarfism:** Caused by decreased growth hormone in childhood
  - ➤ Person becomes ***short***
- **Gigantism:** Caused by increased growth hormone in childhood
  - ➤ Person becomes very ***tall***

(2)Thyroid Gland

- Location: Front of the neck (around trachea)
- Structure: Two lobes
- Hormones:
  a. Thyroxin → Helps in food energy release
  b. Calcitonin → Controls calcium in blood
- Requires iodine from food

Thyroid Disorders

- **Simple Goiter:** Due to lack of iodine → swelling in neck
- **Exophthalmic Goiter:** Too much thyroxin → weight loss, eye bulging

(3)Adrenal Glands

- Location: On top of kidneys
- Hormone: Adrenaline →
  - Helps body respond to fear, anger, emotion
  - Called the emergency hormone

(4)Pancreas Gland – A Mixed Gland

- Location: Between stomach and small intestine
- Functions:
  - Acts as **ductless gland (endocrine):** secretes insulin and glucagon
  - Acts as **duct gland (digestive):** secretes juices
- Hormones of Pancreas and it's functions :

➤ **Insulin**

- *Lowers* glucose in blood by helping cells store it

➤ **Glucagon**

- *Raises* glucose in blood by converting glycogen into glucose

(Note : They do opposite jobs)

Insulin Disorders → Diabetes

- Cause: Low insulin secretion
- Effect: High blood sugar + sugar in urine
- Symptoms: Frequent urination, thirst

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موقع وتطبيق مذكرات جاهزة

(5) Reproductive Glands

1. Testes (in males)

- Hormone: Testosterone
  - Controls *male secondary sex characteristics*

2. Ovaries (in females)

- Hormones:
  - Estrogen → *Female secondary sex characteristics*
  - Progesterone → Prepares uterus lining for pregnancy

Synthesis of Growth Hormone by Genetic Engineering

- In 1979, scientists used genetic engineering to produce human growth hormone.
- A human gene that gives instructions to make the hormone was inserted into bacterial DNA.
- This allowed bacteria *to make large amounts of human growth hormone.*

Steps of synthesis:

1. DNA is removed from the bacterial cell.
2. A human gene (for growth hormone) is separated.
3. The human gene is inserted into bacterial DNA.
4. The new DNA is put back into the bacteria.
5. Bacteria multiply, producing more hormone.
6. Hormone is separated and purified.
7. The hormone is used to treat dwarfism (limited growth in children).

(In 1985, the hormone was confirmed to be safe and effective)

Endocrine Glands & Hormones

Gland	Hormones	Functions
Pituitary	Growth hormone	Promotes body growth: bones, muscles, organs
	Thyroid stimulating hormone (TSH)	Stimulates thyroid gland to secrete thyroxin and calcitonin
	Activating hormones of sexual glands	Regulates and activates sexual glands before adulthood
	Adrenal glands activating hormone	Activates adrenal glands to secrete adrenaline
	Mammary glands activating hormone	Helps mammary glands secrete milk during breastfeeding
Thyroid	Thyroxin hormone	Releases energy from food
	Calcitonin hormone	Controls calcium level in blood
Adrenal	Adrenaline hormone	Helps body organs respond to fear and emergencies
Pancreas	Insulin hormone	Stores glucose in the liver (when glucose is high)
	Glucagon hormone	Releases glucose from the liver (when glucose is low)
Two Ovaries	Estrogen hormone	Causes female secondary sex characteristics
	Progesterone hormone	Grows the uterus lining (endometrium)
Two Testes	Testosterone hormone	Causes male secondary sex characteristics

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Part 3

Scientific term

1 **Hormone**
- A chemical messenger that controls body functions

2 **Endocrine glands**
- Glands that release hormones directly into the blood.

3 **Target cells**
- Cells affected by specific hormones.

4 **Hormone disorder**
- Imbalance in hormone secretion causing health issues.

5 **Dwarfism**
- Short stature from low growth hormone in childhood.

6 **Gigantism**
- Excessive height from high growth hormone in childhood.

7 **Diabetes**
- Disease from low insulin, causing high blood sugar.

8 **Exophthalmic goiter**
- Thyroid swelling with eye bulging due to excess thyroxin

9 **Simple goiter**
- Thyroid swelling from low thyroxin

10 **Genes**
- DNA parts controlling inherited traits

11 **Chromosome**
- DNA + protein structure carrying genes.

12 **Human genome**
- Complete gene map of human chromosomes.

13 **Heredity traits**
- Traits passed from parents to offspring.

14 **Acquired traits**
- Traits not inherited.

15 **Genetics**
- Study of heredity

16 **Mendel's 1st law (Segregation):**
- One trait appears in the first generation; both traits appear in a 3:1 ratio in the second.

17 **Mendel's 2nd law (Independent assortment)**
- Traits pass independently with a 3:1 ratio.

18 **Complete dominance**
- Dominant trait masks the recessive one.

19 **Gametes**
- Reproductive cells transferring traits

20 **Dominant trait**
- Appears with at least one dominant gene

21 **Recessive trait**
- Appears only with two recessive genes

22 **Dominant gene**
- Shows trait even with one copy

23 **Recessive gene**
- Needs two copies to show trait

24 **Pure individual**
- Has two same genes (either dominant or recessive).

25 **Hybrid individual**
- Has one dominant and one recessive gene

26 **Electric current**
- Flow of electrons in a conductor

27 Current intensity
- Amount of charge passing in one second.

28 Ampere
- Unit of current; 1 A = 1 coulomb/second.

29 Coulomb
- Charge transferred by 1 ampere in 1 second

30 Electric potential
- The ability of a conductor to transfer electricity

31 Potential difference
- Work done to transfer charge between two points.

32 Volt
- 1 volt = 1 joule/1 coulomb; or 1 ampere × 1 ohm.

33 Electromotive force (e.m.f)
- Potential difference when the circuit is open.

34 Resistance
- Opposition to current flow

35 Ohm
- Resistance allowing 1 ampere with 1 volt difference.

36 Variable resistance
- Resistance that can be adjusted

37 Ohm's law
- Current ∝ Voltage when temperature is constant.

38 Electrochemical cell
- Converts chemical energy to electric energy

39 Electric generator
- Converts mechanical to electric energy

40 Direct current (D.C.)
- Current in one direction

41 Alternating current (A.C.)
- Current that reverses direction

42 Radioactive elements
- Atoms with unstable nuclei due to extra neutrons

43 Natural radioactivity
- Spontaneous decay for stability.

44 Artificial radioactivity
- Radiation from nuclear reactions/bombs

45 Radiation pollution
- Increased radiation in the environment

46 Physical effects
- Radiation-caused body changes

47 Genetic effects
- Radiation-induced changes in chromosomes

48 Cellular effects
- Damage or death of cells from radiation

49 Isotopes
- Atoms with same protons but different neutrons

50 Sievert
- Unit of absorbed radiation

51 Chemical reaction
- Breaking and forming of chemical bonds

52 Thermal decomposition
- Breakdown by heat

53 Activity series
- Metal ranking by reactivity

54 Simple substitution
- One element replaces another in a compound

55 Double substitution
- Two compounds exchange ions to form new ones

56 Neutralization
- Acid + base → salt + water.

57 Oxidation
- Gains oxygen/loss of hydrogen or electrons

58 Reduction
- Loss of oxygen/gains hydrogen or electrons

59 Oxidizing agent
- Gives oxygen/takes hydrogen or gains electrons

60 The principle of complete dominance
- It is the expression of a dominant hereditary trait in the first-generation offspring resulting from the cross between two pure individuals with contrasting traits.

61 Reducing agent
- Takes oxygen/gives hydrogen or loses electrons

62 Reaction speed
- Change in concentration over time

63 Catalyst
- Substance changing reaction rate without being used up

64 Positive catalytic reaction
- Catalyst increases speed

65 Negative catalytic reaction
- Catalyst decreases speed

66 Enzyme
- Biological catalyst speeding up reactions in living things

Part 4 Give reasons

1 اقرأهم وافهمهم عشان لما تجاوب تجاوب بفهمك مش بحفظك ، متقعدش تتمشي في البيت رايح جاي بتحفظ فيهم ولو وقفت علي دماغك هتنساهم برضو ، انت مش صغير افهم ولما يجيلك السؤال قوله السبب اللي انت فاهمه في دماغك

2 طب انت عارف السبب في دماغك وفاهمه بس مش عارف تكتب الجملة عشان ناسي الكلمات ، فركز وانت بتقرأهم دلوقتي عشان تفهمهم تراجع الكلمات اللي انت عارف انها هتوقفك لو جيت تكتب لوحدك ، انا مش بقلل منك انت اشطر واحد بس انا خايف عليك

1 Radiation has genetic effects
- Because radiation changes the structure of sex chromosomes in living organisms.

2 Workers must wear protective gear
- Because it protects them from radiation pollution.

3 Radioactive waste must be away from water
- Because it prevents pollution of underground water.

4 Storage areas must be stable
- Because it prevents the spread of radiation to other areas.

5 Series connection gives more e.m.f
- Because the total e.m.f is the sum of all cells connected in series.

6 Atom's mass is in the nucleus
- Because electrons have a very small mass compared to protons and neutrons.

7 Nucleus holds together despite repulsion
- Because the nuclear binding force overcomes the repulsion between protons.

8 Radioactive nuclei are unstable
- Because they have excess energy due to extra neutrons.

9 Radioactive atoms emit radiation
- Because they need to lose excess energy to be stable.

10 Some elements are radioactive
- Because their atoms release energy automatically.

11 Uranium is radioactive
- Because it has extra neutrons that cause radiation.

12 Radiation is natural and artificial
- Because it comes from space or nuclear reactions.

13 Radiation pollution occurs
- Because radiation increases in the environment.

14 Chernobyl reactor exploded
- Because of an operation error.

15 Food was polluted after Chernobyl
- Because radioactive clouds moved with wind and rain to plants and animals.

16 Radiation pollution happens even without explosion
- Because radiation is carried by wind or rain to the Earth's surface.

17 High radiation reduces red blood cells
- Because bone marrow gets damaged and can't produce them

18 Electrons rotate around the nucleus
- Because they are attracted by the nucleus.

19 Electrons can leave the atom
- Because of weak attraction with the nucleus.

20 Current flows only in a closed circuit
- Because all components are connected.

21 Ammeter is connected in series
- Because it measures the current in the circuit.

22 No current flows if conductors have same potential
- Because there is no potential difference.

23 More current means more voltage
- Because current is proportional to voltage across the conductor.

24 Voltmeter is connected across two ends
- Because it measures the potential difference.

25 Voltmeter across battery
- Because it measures the e.m.f of the battery.

26 Transformer is used for phone charging
- Because it adjusts the voltage to a suitable level.

27 Rheostat controls current
- Because it changes resistance in the circuit.

28 Increasing wire length reduces current
- Because resistance increases and current decreases.

29 Graph shows alternating current
- Because it changes direction and intensity.

30 AC is better than DC
- Because it travels long distances and can be converted.

31 Generators produce AC
- Because it's suitable for appliances and can be changed to DC.

32 Cells in series give high e.m.f
- Because the voltages add together.

33 Cells in parallel give low e.m.f
- Because the total is equal to one cell only.

34 Electric energy is the cleanest
- Because it doesn't cause pollution.

35 Atom is electrically neutral
- Because protons equal electrons

36 Nucleus is positive
- Because it contains protons and neutrons.

37 Free ear lobe is dominant
- Because its gene dominates over the attached one.

38 Wide eyes dominate narrow eyes
- Because wide eyes gene is stronger.

39 Parents with free ear lobe can have child with attached lobe
- Because both may carry the recessive gene.

40 DNA carries genetic info
- Because it contains genes.

41 Enzymes affect traits
- Because genes produce special enzymes that show traits.

42 500,000 people lose sight yearly
- Because of Vitamin A deficiency.

43 Scientists modify rice
- Because it doesn't contain carotene to make Vitamin A.

44 Rice eaters may lack Vitamin A
- Because rice has no provitamin A.

45 Walking isn't genetic
- Because it's an acquired trait.

46 Playing basketball isn't hereditary
- Because it's learned, not inherited.

47 Mendel is the father of heredity
- Because his experiments started the science of genetics.

48 Mendel chose pea plants
- Because they grow fast, self-pollinate, and show clear traits.

49 Stamens removed
- to stop self-pollination.

50 Stigmas covered
- to avoid cross-pollination.

51 Self-pollinated several generations
- to ensure trait purity.

52 First law: segregation
- Because genes separate during gamete formation.

53 Green color disappeared
- Because it's recessive.

54 Green pods are dominant
- Because green gene dominates yellow gene.

55 Tall stems are dominant
- Because of complete dominance.

56 Recessive trait is pure
- Because it only shows when both genes are recessive.

57 Hidden traits appear in offspring
- Because they get recessive genes from both parents.

58 Curly hair dominates smooth
- Because curly gene is dominant

59 One curly gene gives curly hair
- Because one dominant gene is enough

60 Tongue rolling is dominant
- Because it dominates non-rolling gene.

61 Endocrine glands are called so
- Because they release hormones directly into the blood

62 Blood is hormone transport
- Because targets are far from glands

63 Pituitary = master gland
- Because it controls other glands.

64 Pituitary helps birth & breastfeeding
- Because it releases needed hormones

65 Giants have too much growth hormone
- Because of high hormone secretion.

66 Dwarfs have little growth hormone
- Because of low hormone secretion

67 Iodine salt is better
- Because it has iodine for making thyroxin hormone.

68 Enlarged thyroid
- Because of hormone imbalance.

69 Goiter from no iodine
- Because thyroxin can't form without it.

70 Thyroid controls calcium
- Because it releases calcitonin hormone.

71 Adrenal glands help in emergencies
- Because they release adrenaline

72 Pancreas is a mixed gland
- Because it secretes both hormones and enzymes.

73 Pancreas has two functions
- Because insulin and glucagon have opposite effects

74 Insulin treats diabetes
- Because it lowers blood sugar.

75 The speed of chemical reaction increases by increasing the surface area
- Because more reactant particles are exposed to reaction.

76 Burning steel scourers in pure oxygen is faster than in air
- Because pure oxygen increases the concentration of oxygen gas.

77 Reaction speed increases with concentration
- Because more reactant particles increase the number of collisions.

78 Reaction rate increases by increasing temperature
- Because more collisions happen when particles move faster

79 Cooking food faster needs more heat
- Because higher temperature increases reaction rate

80 The fridge preserves food
- Because low temperature slows down bacteria's chemical reactions.

81 Catalysts are used in chemical reactions
- Because they increase the rate of reaction.

82 Manganese dioxide speeds up gas release in hydrogen peroxide
- Because it acts as a catalyst to decompose hydrogen peroxide.

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83 Sweet potato increases hydrogen peroxide decomposition

- Because its enzyme acts as a catalyst for the reaction.

84 White precipitate forms when silver nitrate is added to sodium chloride

- Because silver chloride is formed and it is insoluble in water.

85 In $H_2 + CuO$, hydrogen is a reducing agent

- Because it removes oxygen from copper oxide.

86 In $2Na + Cl_2$, sodium is a reducing agent

- Because it loses an electron and chlorine gains it.

87 Oxidation and reduction happen together

- Because electrons lost in oxidation are gained in reduction.

88 Metals are reducing agents, nonmetals are oxidizing agents

- Because metals lose electrons and nonmetals gain electrons.

89 Oxidation and reduction happen at the same time

- Because they involve electron loss and gain simultaneously.

90 Ionic reactions are fast, covalent reactions are slow

- Because ionic reactions occur between ions while covalent reactions occur between molecules.

91 $NaCl + AgNO_3$ is a fast reaction

- Because it involves ions formed in water solution.

92 Iron filings react faster than iron blocks

- Because they have larger surface area.

93 Nickel filings hydrate faster than nickel pieces

- Because they have greater surface area for reaction.

94 Metallic elements are arranged by activity

- Because it helps compare their chemical reactivity

95 Aluminium and zinc react with acid, but copper doesn't

- Because aluminium and zinc are more active than hydrogen, while copper is not.

96 Aluminium reacts slower than zinc despite higher activity

- Because it has an oxide layer that slows the reaction.

97 Magnesium replaces copper, but copper can't replace magnesium

- Because magnesium is more active than copper.

98 Red precipitate forms when magnesium is added to copper sulphate

- Because magnesium replaces copper, and copper precipitates.

99 Blue colour disappears when zinc is added to copper sulphate

- Because zinc replaces copper forming colourless zinc sulphate.

100 Don't keep silver nitrate in aluminium containers

- Because aluminium replaces silver and causes corrosion

101 Effervescence occurs when aluminium is added to acid

- Because aluminium replaces hydrogen in acid.

102 Silvery colour forms when heating red mercuric oxide

- Because it decomposes into mercury and oxygen gas.

103 Black substance forms by heating blue copper hydroxide

- Because it decomposes into copper oxide and water.

104 Black substance forms by heating green copper carbonate

- Because it decomposes into copper oxide and carbon dioxide.

105 Blue copper sulphate turns black by heating

- Because it decomposes into copper oxide and sulphur trioxide.

106 Yellowish white colour forms from heating white sodium nitrate

- Because it decomposes into sodium nitrite and oxygen gas.

Part 5

What Happens:

1 If glands had ducts
- Blood would not be the only way to transport hormones.

2 If there's deficiency in growth hormone in childhood
- The person becomes a dwarf because the body stops growing.

3 If growth hormone increases in childhood
- The person becomes a giant because of continuous bone growth.

4 If thyroxin hormone increases
- The person suffers from exophthalmic goiter.

5 If there's deficiency of thyroxin hormone
- The person suffers from simple goiter.

6 If little iodine is taken
- Thyroxin secretion decreases, leading to simple goiter.

7 If man is exposed to emergency
- Adrenal glands release adrenaline to prepare the body for action.

8 If pancreas does not secrete glucagon
- Blood sugar level decreases.

9 If insulin secretion decreases
- Blood sugar level increases or the person may get diabetes.

10 If glucagon secretion decreases
- Blood sugar level decreases.

11 If blood sugar level decreases
- Pancreas secretes glucagon to raise the sugar level.

12 If blood sugar level increases
- Pancreas secretes insulin to lower the sugar level.

13 If testosterone is not secreted in males
- Male secondary sex characteristics won't appear.

14 If estrogen is not secreted in females
- Female secondary sex characteristics won't appear.

15 If dominant gene exists with recessive one
- The dominant trait appears.

16 Short stem pea + hybrid tall stem
- 50% hybrid tall, 50% pure short.

17 Pollinating hybrid yellow seeds
- 3 yellow : 1 green

18 Mating 50% dominant & 50% recessive
- Dominant individuals will be hybrids.

19 Dominant gene with recessive gene
- The dominant hides the recessive

20 Cross-pollinating yellow pods × green pods
- All offspring will have green pods

21 Tall red × short white pea plants
- 9:3:3:1 ratio in second generation.

22 Mating two individuals with rolling tongue trait
- Offspring will be able to roll their tongues.

23 If gene fails to produce enzyme
- The trait depending on that protein won't appear

24 Relying on rice as main food
- Vitamin A deficiency may cause loss of sight.

25 Stigmas uncovered during experiment
- Cross-pollination happens

26 Mendel didn't remove stamens
- Self-pollination happens

27 Pure dominant × pure recessive
- Offspring will be 100% hybrid dominant

28 Crossing two pure plants with two contrasting traits
- Offspring carry dominant traits only (3:1 in second gen).

29 Resistance burnt during Ohm's Law experiment
- No current flows; ammeter = 0, voltmeter = e.m.f of battery.

30 Cells connected in series
- e.m.f increases

31 Cells connected in parallel
- e.m.f equals e.m.f of one cell

32 Atoms have excess neutrons
- Atom emits radiation to become stable.

33 Large radiation exposure for short time
- May damage bone marrow, spleen, digestive, nervous system.

34 Decrease in red blood cells
- Person feels tired, may have sore throat and nausea.

35 Small radiation dose for long time
- Physical, genetic, and cellular effects may occur.

36 Attraction force vanishes between nucleus and electrons
- Outer electrons become free.

37 Two charged conductors with different potential connected
- Current flows from higher to lower potential

38 Same electric potential connected
- No current flows

39 More charges pass per second
- Current intensity increases

40 Doubling the time for charge flow
- Current intensity halves

41 Increasing rheostat wire length
- Resistance increases; current decreases.

42 Ohm's circuit has no variable resistor
- Can't verify Ohm's law.

43 Doubling voltage at constant temperature
- Current doubles.

44 Increasing resistance in Ohm's circuit
- Ammeter & voltmeter readings decrease

45 Fixed resistance spoils
- No current flows; ammeter reads zero.

46 Chlorine gains electron
- It becomes chloride ion and acts as oxidizing agent.

47 Reactants are broken up
- Surface area increases, so reaction speeds up.

8 Use dilute instead of concentrated HCl
- Reaction becomes slower.

49 Add NaOH to blue copper sulfate
- Blue disappears; blue precipitate of $Cu(OH)_2$ forms.

50 Effervescent tablets in hot vs. cold water
- Faster reaction in hot water

51 Add NaOH to blue copper sulfate
- Blue disappears; blue precipitate of $Cu(OH)_2$ forms.

52 Effervescent tablets in hot vs. cold water
- Faster reaction in hot water

53 Food left in summer outside fridge
- It rots due to faster bacterial reactions

54 Temperature of reaction increases
- Reaction rate increases

55 Replace iron filings with iron piece
- Reaction rate decreases

56 Increase surface area exposed to reaction
- More collisions → faster reaction

57 Increase concentration of reactants
- Reaction speed increases

58 Increase temperature
- More collisions happen → faster reaction

59 Add MnO_2 to hydrogen peroxide
- It decomposes into water + oxygen.

60 Add sweet potato to hydrogen peroxide
- Decomposition becomes faster.

61 Add negative catalyst
- Reaction speed decreases

62 Heat red mercuric oxide
- Silver mercury + oxygen evolve.

63 Heat copper hydroxide
- Black copper oxide + water form

64 Heat copper carbonate
- Black copper oxide + CO_2 gas form

65 Heat blue copper sulphate
- Black copper oxide + SO_3 gas form

66 Heat sodium nitrate
- Yellowish white sodium nitrite + oxygen form

67 Add sodium to water
- Ignition + hydrogen gas + heat produced

68 Add dilute HCl to copper
- No reaction occurs

69 Add dilute HCl to zinc
- Zinc reacts + hydrogen gas evolves

70 Add magnesium to blue copper sulphate
- Blue disappears + red copper precipitates

71 Add NaOH to blue copper sulfate
- Blue disappears; blue precipitate of $Cu(OH)_2$ forms.

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Questions

Section 1

1 Choose the correct answer:

1 When copper hydroxide is heated we obtain.....

a Copper carbonate and water B Copper oxide and water
C Copper and hydrogen D Copper oxide and hydrogen

1 The Sliding Rheostat used to change ..... and .....

a The current intensity and potential difference B the resistance and potential difference
C current intensity and resistance D current intensity and kinetic energy

3 Hormone which controls percentage of calcim in the blood is.....hormone

a calcitonin B thyroxin C insulin D adrenalin

4 The electric potential difference is measured by.....

a ammeter B ohmmeter C voltmeter D wattmeter

2 Complete the following statements :

1 The current flow through a conductor is.....proportional to resistance

2 The unit used to measure the current intensity is known as.....

3 During.....reactions, compound breaks by heat to its simple components.

4 Hormones are directly secreted into the blood stream by.....

5 Thyroxin is a.....that regulates food assimilation in body.....

3 put (✓) or (x) for each statement :

1 In a dynamo, light energy is converted into electrical energy ☐

2 An ohmmeter is used to measure electrical resistance in an electrical circuit ☐

3 Most metal sulphates decompose into metal oxide and carbon dioxide ☐

4 Write the scientific term or define the following as required:

1 Breaking molecules of the reactants and the forming of new products. (.....)

2 reduction process : .....

3 Amount of electric charges that flow in a conductor in a certain time. (.....)

5 Various questions

1 **You have four similar electric cells, the potential difference of each 1.2 volt, and show by diagram the method of connection together to obtain a battery its electromotive force**

a-1.2volt — b- 4.8 volt — c- 2.4 volt

.....

.....

.....

.....

.....

.....

2 **By using symbolic formulae complete and balance the following equations :**

1-.....= $2Hg + O_2$

2- $2NaNO_3$ = ... $+O_2$

3- NaOH + ...= $2NaCl + H_2O$

3 **What is the scientific idea on which:**

the air bag in cars is dew signed on the occurrence of the car crash they get vacuumed and sodium nitride decomposes forming nitrogen that fills the air bag on crashing. ($2Na_3N = 2Na + 3N_2$)

.....

.....

.....

.....

.....

.....

6 Give a reason for the following :

Electric energy is the cleanest

.....

.....

7 What happens if ...?

If glands had ducts

.....

.....

Section 2

1 Choose the correct answer:

1 When calcium carbonate is heated..... is Obtained

a Calcium bicarbonate, and carbon dioxide B Calcium hydroxide and carbon dioxide
C Calcium oxide and carbon monoxide D Calcium oxide and carbon dioxide

2 The Ammeter is used to Measure ..... in the electric circuit.

a The potential difference B the current intensity C the resistance

3 The ..... hormone releases the needed energy from the food stuffs

a Growth B estrogen C thyroxin D insulin

4 The.....compound is used in the dry electrode.

a Sodium chloride B ammonium chloride C magnesium chloride

2 Complete the following statements :

1 Oxidization is a chemical process where atom ..... electron or more.

2 ..... and .....discovered the means of how gene controls appearance trait

3 ..... and .....hormones are produced from thyroid gland

4 .....agent is the substance which gains one electron or more

5 While connecting charged conductors, the electric current passes from the conductor have .....potential to the conductor have .....potential .

3 put (✓) or (x) for each statement :

1 Electric current intensity is measured by using ammeter apparatus. ☐

2 Oxidation is a chemical process where the atom gains an electron or more. ☐

3 Electric generators produce direct current. ☐

4 Write the scientific term or define the following as required:

1 gland secretes a hormone to regulate growth of the human sexual organs. (.....)

2 Ohm : .....

3 iis a disease caused by decreasing in insulin (.....)

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5 Various questions

1 Compare between : Heating of metal oxide and metal hydroxide.

.....

.....

2 Identify the process of oxidization, reduction, oxidizing factor and reducing factor in the following reaction: $2Cr^{+3} + 3Zn \longrightarrow 2Cr + 3Zn^{+2}$

.....

.....

3 calculate quantity of electricity passed in a conductor its resistance 2200 ohm for two minutes when connected with electric source its electric potential 220 volt

.....

.....

4 Mention the difference between the following:

the connection of electric cells in series and in parallel from the point of the value of produced electromotive force

.....

.....

.....

5 Explain the following : Occurrence of effervescence on putting aluminum in diluted hydrochloric acid .

.....

.....

6 Give a reason for the following :

Electrons rotate around the nucleus

.....

.....

7 What happens if ...?

If thyroxin hormone increases

.....

.....

Section 3

1 Choose the correct answer:

1. The mathematical relation Of Ohim's law.....
   a) R = V / I B) I=RV C) R = V x I
2. The hormone responsible for producing secondary sexual male characteristics is .....
   a) Progesterone B) testosterone C) adrenalin
3. Electric resistance value of a conductor changes when the value of .....Changes
   a) The conductor dimension B) The passing electric current intent intensity
   C) The potential difference between its ends D) The other components in the electric circuit
4. Calcitonin is secreted by .....
   a) Pancreas B) Liver C) Thyroid gland D) Pituitary gland

2 Complete the following statements :

1. ..... and.....were able to make a model for the DNA molecule.
2. Types of mutation according to the inheritance to..... and.....
3. ..... is the reaction between acid and alkali to form salt and water.
4. Electric current generated from a dynamo due to changing..... energy .....
5. ..... and.....hormones are produced from Pancreas gland

3 put (✓) or (x) for each statement :

1. The individual that inherit just one gene for facial freckles trait from one of their parents, the trait does not appear on him. ( )
2. The electric current intensity passing through a conductor due to the flow of 5400 coulomb in 5 minutes equals 18 ampere. ( )
3. The ratio of gametes TR is 75 % in a plant whose genetic structure is TtRr. ( )

4 Write the scientific term or define the following as required:

1. it is a part of DNA that presents on the chromosomes (.....)
2. Electric current intensity : .....
3. The result when endocrine glands does not work properly. (.....)

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5 Various questions

1 Write the kind of each reaction

1- $H_2 + CuO \rightarrow Cu + H_2O$: .....

2- $2KOH + HCl \rightarrow 2KCl + H_2$: .....

3- $2Na + 2HCl \rightarrow 2NaCl + H_2$: .....

2 Problem :

1-The potential difference between the two ends of a conductor is 6 volts and the electric current intensity passing in the conductor is 0.5 ampere what is the electric current intensity passing in the conductor if it is connected by electric source its electric potential is 12 volts

.....

.....

2-Use symbols to express the results of the pollination between a pure red-flowered pea plant and a white-flowered pea plant showing parents, gametes and first generation.

(Note that : symbol (R) refers to the gene of the red flower symbol (r) refers to the gene of the white flower.)

.....

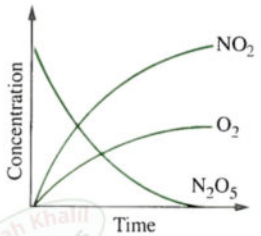
.....

.....

.....

3 Study the following figure , then answer :

1- According to this figure :The resultant substances are..... and.....



6 Give a reason for the following :

Wide eyes dominate narrow eyes

.....

.....

7 What happens if ...?

If little iodine is taken

.....

.....

Section 4

1 Choose the correct answer:

1. The reaction $Cl_2 + 2e^- \rightarrow 2Cl$ represents the process of.....
   (a) Oxidation (B) Reduction (C) Decomposition (D) Substitution
2. When copper filings is added to dilute hydrochloric acid..... is formed
   (a) Copper hydroxide (B) Copper carbonate (C) Copper chloride (D) No reaction occurs
3. The only way for hormones to reach the target cells is .....
   (a) water (B) saliva (C) blood (D) nerves
4. The ..... hormone releases the energy needed for the body from nutrients.
   (a) growth (B) estrogen (C) thyroxin (D) testosterone

2 Complete the following statements :

1. When hydrogen gas passed over hot copper oxide, it converts to a.....
2. Breakup of bonds in reactants and forming of new bonds is called.....
3. 0xidation and reduction are two..... processes
4. Cell produce ..... current while the dynamo produces..... current
5. .....hormone secreted if the rate of glucose sugar increases in blood

3 put (✓) or (x) for each statement :

1. Genes control the hereditary traits of an individual. ☐
2. Oxidation and reduction are two concurrent processes and occur at the same time. ☐
3. The covalent compounds react faster than ionic compounds. ☐

4 Write the scientific term or define the following as required:

1. Organs secrete hormones directly in the blood stream. (.....)
2. Recessive traits : .....
3. Chemical reactions in which an element substitutes another one. (.....)

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5 Various questions

1 From the opposite chemical reactions :

What is the chemical formula of compound (A) and the element (B) ?

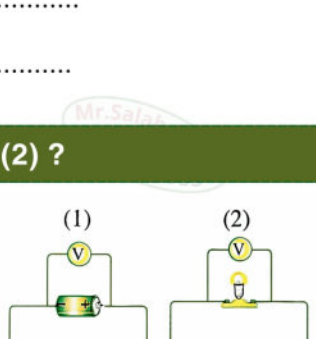
1. $CuSO_4 \xrightarrow{\Delta} (A) + SO_3$ .....

2. $(A) + H_2 \xrightarrow{\Delta} (B) + H_2O$ .....

2 What does the voltmeter reading indicate to in the two circuits (1) and (2) ?

1. In circuit number (1) : .....

2. In circuit number (2) : .....



3 Study the reactions in the following diagram, then answer :

1. The compound (C) is ..... and compound (B) is .....

2. The .....process happens to matter (A) , While ..... process happen to matter (B)

$$Mg + 2HCl \longrightarrow MgCl_2 + \boxed{A}$$
$$\boxed{C} \xrightarrow{\Delta} CO_2 + \boxed{B} \Big\} Cu + H_2O$$

4 The level of normal glucose sugar in the blood is (80 — 130 milligmldecilitre) before eating approximately :

1. Which gland is responsible for adjusting blood glucose level ? .....

2. How it does that in case of increase or decrease of glucose sugar ?

.....

.....

.....

6 Give a reason for the following :

More current means more voltage

.....

.....

7 What happens if ...?

Pure dominant × pure recessive

.....

.....

Section 5

1 Choose the correct answer:

1 Aluminium practically delays in its reaction with hydrochloric acid due to the presence of.....layer.

(a) aluminium oxide (B) aluminium chloride (C) aluminium hydroxide (D) aluminium sulphate

2 The element that contains a number of neutrons more than that required for its stability is .....

(a) calcium (B) radium (C) sodium (D) hydrogen

3 In the following reaction : $Fe + 2HCl \rightarrow FeCl_2 + H_2$ The reaction ends in a short time on using all of the following, except .....

(a) concentrated hydrochloric acid. (B) a piece of iron.
(C) iron filings . (D) heat.

4 ..... glands secrete chemical substances called hormones.

(a) Endocrine (B) Sweat (C) Lymphatic (D) Ductile

2 Complete the following statements :

1 The current flow through a conductor is .....proportional to resistance

2 Iron rusting is a result of..... chemical reactions.

3 According to Mendel 's first law, the hereditary factors..... when the gametes are formed

4 Catalyst is used to slow down a chemical reaction in.....catalytic reactions.

5 The trait that appears in all individuals in the first generation is ..... trait.

3 put (✓) or (x) for each statement :

1 The genes are parts of DNA present in the cytoplasm of the cell. ☐

2 It is possible to produce offspring with freckles on the face in spite of their absence in the parents. ☐

3 Hydrochloric acid reacts with sodium carbonate producing a gas that turbid clear lime water. ☐

4 Write the scientific term or define the following as required:

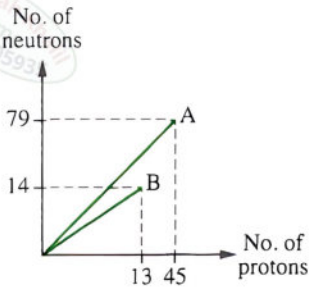
1 Through which the hereditary traits are transmitted from parents to offspring. (.....)

2 Positive catalytic reaction : .....

3 Chemical compound Which is resulted from the reaction of acid with alkali. (.....)

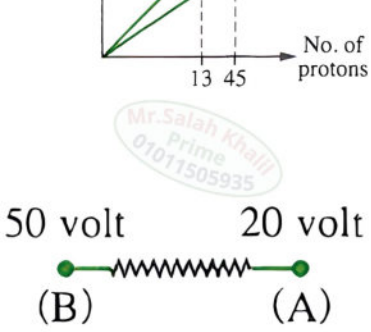
5 Various questions

1 Study the following figure , then answer :



1- In the opposite figure, the element ..... is radioactive due to .....

2- In the opposite figure if the resistance of wire 10 ohm, the passing current intensity equal..... and its direction from ..... to .....



2 You have a tall stem pea plant, how you can make sure on genetic bases from purity of trait (use the symbol (T) for tall stem trait and (t) for short stem trait.).

3 Pancreas secretes two hormones which have opposite functions, what are the names of these hormones and the function of each of them ?

.....

.....

6 Give a reason for the following :

High radiation reduces red blood cells

.....

.....

7 What happens if ...?

Resistance burnt during Ohm's Law experiment

.....

.....

Section 6

1 Choose the correct answer:

1 Double substitution reactions between salts solution are accompanied by formation of .....

(a) metal (B) nonmetal (C) oxide (D) precipitate

2 Simple goiter when secretion of.....hormone decreases.

(a) adrenalin (B) thyroxin (C) parathormone (D) insulin

3 The speed of decomposition of hydrogen peroxide increases by adding.....

(a) manganese oxide. (B) magnesium oxide (C) manganese dioxide (D) chromium oxide.

4 On preparing oxygen gas from hydrogen peroxide, we use .....as a catalyst

(a) MgO (B) MnO_2 (C) MgO_2 (D) K_2O

2 Complete the following statements :

1 From the using of nuclear energy in.....field, improve some plant races.

2 The two factors of hereditary traits are similar in the ,..... individual.

3 The work done is measured by.....unit.

4 When a silver nitrate solution is added to a sodium chloride solution a ..... solution is formed, which gives .....gas when it is heated.

5 When adding a solution of sodium hydroxide to a blue solution of copper sulphate, a colourless solution of ..... is formed and also a blue precipitate of.....

3 put (✓) or (x) for each statement :

1 Potassium reacts with water momentarily. ☐

2 The reaction of hydrochloric acid with sodium carbonate is called a double substitution reactions. ☐

3 Mendel removed petals from the pea plant's flowers to ensure that the plant doesn't self pollinate. ☐

4 Write the scientific term or define the following as required:

1 A device that is used to measure the electromotive force (.....)

2 Sievert : .....

3 Used in some electric circuits to control current intensity as the resistance directly proportional with the length of wire. (.....)

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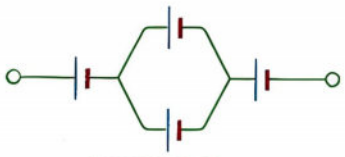
5 Various questions

1 In the opposite figure : (if the electromotive force for each cell = 1.2 volt)

1 . The electromotive force of the battery =.....

2. The maximum electromotive force that can be obtained by all these cells =.....



2 Study the following diagram, then answer the following questions :

1. Write the chemical formula for both A and B.

.....

2. Indicate the type of chemical reaction (No. 3) between (A) and (B), then write the name of result (C).

.....

.....

$$CuCO_3 \xrightarrow[1]{\Delta} CO_2 + (A)$$

$$(A) + (B) \xrightarrow[3]{\Delta} (C) + H_2O$$

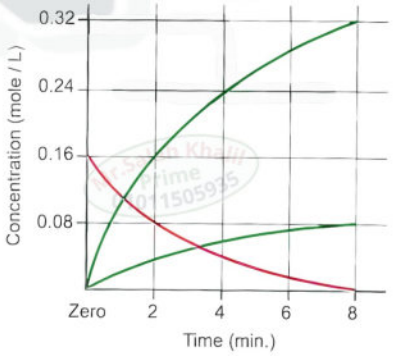
$$Zn + 2HCl \xrightarrow[2]{} ZnCl_2 + (B)$$

3 Study the opposite graph, which represents the rate of decomposition of nitrogen pentoxide.

1. Write the balanced chemical equation that represents the chemical reaction.

2. The concentration of oxygen gas is .....concentration of nitrogen dioxide gas.

(four times –three times – quarter – half)



6 Give a reason for the following :

DNA carries genetic info

.....

.....

7 What happens if ...?

Cells connected in parallel

.....

.....

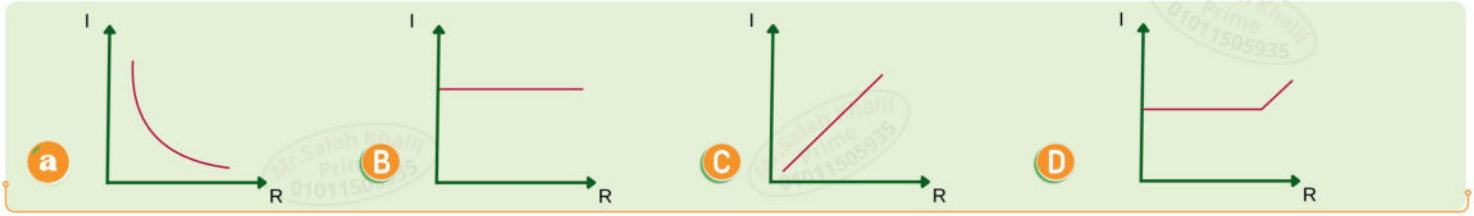
Section 7

1 Choose the correct answer:

1 The most affected when human body exposed to large dose in short period of time is .....

(a) stomach (B) larynx (C) bone marrow (D) kidney

1 Which of the following graph represents the relation between current intensity passing through a conductor and its resistance at constant potential difference ?



3 .....is responsible for the formation of blood cells.

(a) The brain (B) Bone marrow (C) The digestive system (D) central nervous system

4 Sodium ..... is present inside the airbag.

(a) oxide (B) nitride (C) azid (D) sulphate

2 Complete the following statements :

1 The scientist.....discovered the emission of invisible rays from the .....element.

2 Relatively active metal + acid $\xrightarrow{\text{dil.}}$ ..... + ...

3 The measuring unit of the ratio between the work done and the potential difference is..... which equivalent to.....

4 The reaction of oil with caustic soda is considered from..... reactions.

5 Target cells are almost located.....the endocrine glands that secrete the hormone affecting them.

3 put (✓) or (x) for each statement :

1 The genetic structure of a hybrid long-stemmed pure red-flowered pea plant (TtRR). ☐

2 When two individuals with the genetic structure (Bb) x (Bb) are mated, the genetic structure (BB) is 50 % likely to appear in the offspring. ☐

3 Connecting electrical poles in series increases the intensity of the current generated in the electrical circuits when the resistance is constant. ☐

4 Write the scientific term or define the following as required:

1 It is the expression of a dominant hereditary trait in the first-generation offspring resulting from the cross between two pure individuals with contrasting traits. (.....)

2 Dominant traits : .....

5 Various questions

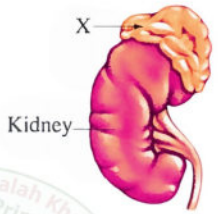
1 Study the opposite figure, then answer the following questions :

1. Mention the name of the gland (X).....

2. What is the name of the hormone which is secreted by this gland ?

and What is its importance ?

.....



2 In the opposite electric circuit :

if the ammeter reading is 5 ampere and the voltmeter reading is 20 volt, and when the rheostat slider is moved the ammeter reading becomes 8 ampere.

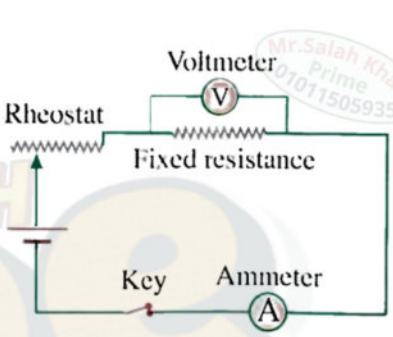
1. What happened to the length of the rheostat wire in the circuit ?

.....

2. Calculate the potential difference between the two ends of the fixed resistance after changing the value of Rheostat.

.....

.....



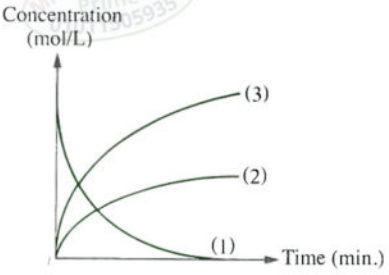
3 The opposite figure shows the rate of decomposition of hydrogen peroxide :

$$2H_2O_2 \longrightarrow 2H_2O + O_2$$

1. State the name of the compound or element that each number refers to

.....

2. The catalyst used in this reaction is .....



6 Give a reason for the following :

Transformer is used for phone charging

.....

.....

7 What happens if ...?

If estrogen is not secreted in females

.....

.....

Section 8

1 Choose the correct answer:

1. The reaction between silver nitrate solution and sodium chloride solution is .....reaction.

a very slow B slow C average D fast

2. According to Mendel's second law, the recessive trait appears in the second generation at a percentage of.....

a 25 % B 50 % C 75% D 100%

3. All the following is considered a measuring unit of potential difference except.....

a volt B ampere x ohm. C joule x coulomb. D joule ÷ coulomb.

4. In the end of the chemical reaction, the concentration of the reactants becomes ..... %

a zero B 25 C 100 D 50

2 Complete the following statements :

1. The radioactive wastes should be buried away from streams of..... and away from regions exposed to.....
2. The electric current produced from.....used in electroplating process.
3. ..... in sweet potato acts as a catalyst which..... the rate of decomposition of hydrogen peroxide into water and oxygen gas.
4. Mendel removed the stamens of the flowers of pea plant before the anther becomes mature to avoid.....
5. In the reaction $2Na + Cl_2 \rightarrow 2NaCl$, the oxidizing agent is.....

3 put (✓) or (x) for each statement :

1. According to the chemical activity series, sodium is considered more active than iron. ☐
2. The endocrine glands secrets chemical substances that called hormones. ☐
3. The chemical formula of Nitrogen pentoxide gas is N_5O_2. ☐

4 Write the scientific term or define the following as required:

1. The type of the chemical reaction which involves the breaking up of the compound into simple elements by the effect of heat (.....)
2. Exophthalmic goiter : .....
3. The hormone which secreted from the pituitary gland to controls the rate of growth of muscles and bones. (.....)

5 Various questions

1 Problem :

When two pea plants were pollinated, both of them had smooth seeds, 100 plants were produced, including 25 plants with pure smooth seeds, 50 plants with hybrid smooth seeds, and 25 plants with wrinkled seeds (if you know that the dominant trait is symbolized by (B) and the recessive gene is symbolized by (b)). Write the genetic structure of the parents and the genetic structure of the resulting plants.

.....

.....

.....

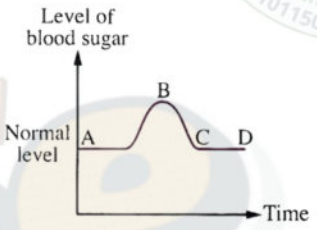
2 The opposite figure illustrates the numbers of the resulting individuals from crossing of two pea plants, both are tall stemmed.

1. At which point does the secretion of the insulin hormone begins ?

.....

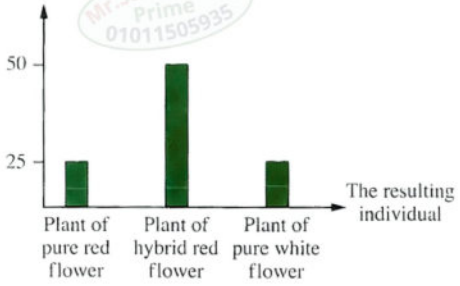
2. What is the gland that secretes it ?

.....



3 The opposite figure illustrates the numbers of the resulting individuals from crossing of two pea plants, both are tall stemmed.

In the opposite figure explain the results on genetic bases indicating the ratio between the resulting individuals. Using symbols (T,t).



6 Give a reason for the following :

Scientists modify rice

.....

.....

7 What happens if ...?

Large radiation exposure for short time

.....

.....

Section 9

1 Choose the correct answer:

1. The international unit of measuring the radiation absorbed by the human body is.....
   (a) Sievert (B) joule (C) coulomb (D) meter
2. The genetic trait which disappears in the first generation, then appears in the second generation is the.....trait.
   (a) dominant (B) recessive (C) hereditary (D) acquired
3. The genetic structure of hybrid long stemmed pea plant with red flower is.....
   (a) TtRr (B) TTRR (C) ttRr (D) ttrr
4. From the examples of electrochemical cells.....
   (a) dynamo (B) dry cell (C) rheostat (D) voltmeter

2 Complete the following statements :

1. ..... begin to secrete their hormones around the age of puberty.
2. When a positive catalyst is used, the amount of energy required for the Chemist reaction to occur ..... and its mass .....
3. The speed of chemical reactions increases by the ..... in temperature
4. By increasing the concentration of the reactants the speed of the chemical reaction .....
5. fireworks reaction is a..... reaction

3 put (✓) or (x) for each statement :

1. The natural radioactive elements are considered unstable due to its excess energy. ☐
2. Metals substitute hydrogen of water to produce metal hydroxide and hydrogen gas evolves. ☐
3. The direct electric current can be transported for short or long distances. ☐

4 Write the scientific term or define the following as required:

1. A safety means is found in modern cars and has a form of an inflatable bag (.....)
2. Hormone : .....
3. The individual who carries two genetic factors one of the dominant trait and the other of the recessive trait. (.....)

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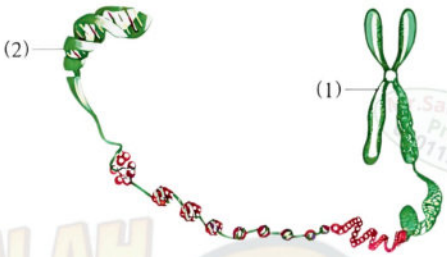
5 Various questions

1 In the opposite figure :

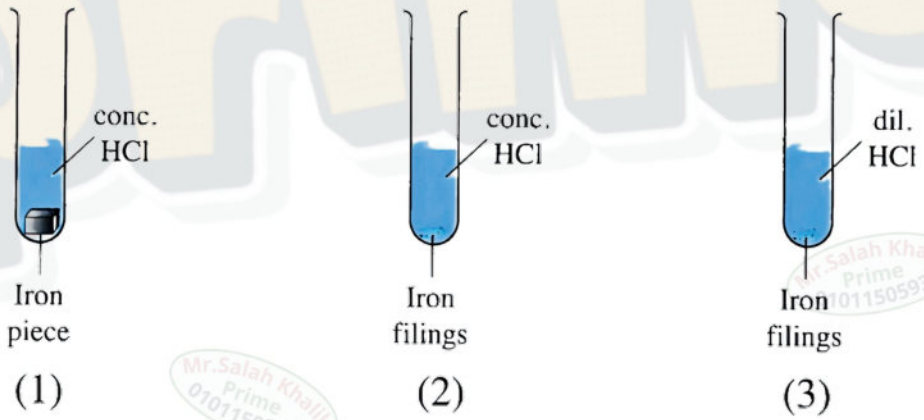
1. Name of the evolved gas is .....
2. Type of the chemical reaction is .....
3. The salt formed is .....

2 In the opposite figure, write what the numbers refer to :

1. .....
2. .....



3 From the following chemical reaction illustrate :



1. Which of these reactions is faster (1 – 2 – 3)?.....
2. The two factors that affect the speed of this reaction are .....and.....

6 Give a reason for the following :

Rheostat controls current

.....

.....

7 What happens if ...?

Temperature of reaction increases

.....

.....

Section 10

1 Choose the correct answer:

1 A lamp that obeys Ohm's law, when the potential difference between its two ends increases to double, so its resistance .....

(a) increases to double (B) decreases to half (C) remains constant (D) increases four times

2 If the genetic structure of one of the offspring is (bb) , then the possible genetic structure of the parents is .....

(a) Bb x Bb. (B) BB x bb (C) BB x BB (D) BB x Bb

3 According to Mendel's first law, the hereditary factors .....when gametes are formed.

(a) combine (B) fuse (C) disappears (D) segregate

4 If two hybrid individuals crossing with each other, 200 individuals produced due to this crossing, so the number of the hybrid individuals among offspring may be individual.

(a) 50 (B) 100 (C) 150 (D) 200

2 Complete the following statements :

1 ..... project is interested in the effect of the various mutations on the function of genes.

2 Transmission of electric charges depends on the..... between two conductors.

3 .....is from the examples of electrochemical cells.

4 Carbon dioxide gas detected by changes ..... into turbid.

5 Every hereditary trait is controlled by two hereditary factors which separate during formation of the .....

3 put (✓) or (x) for each statement :

1 Bone marrow is the first which is affected by nuclear radiation. ☐

2 silver-colored substance is formed when heating a test tube contains a red mercuric oxide. ☐

3 Enzymes work with the nervous system to regulate and coordinate the body's various activities and functions. ☐

4 Write the scientific term or define the following as required:

1 Shows trait even with one copy (.....)

2 Simple goiter : .....

3 Work done to transfer charge between two points. (.....)

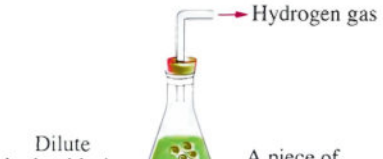
5 Various questions

1 From the opposite figure :

1 . Suggest one method to increase the speed of the evolving hydrogen gas. :.....

2. Determine the oxidizing agent in this reaction.

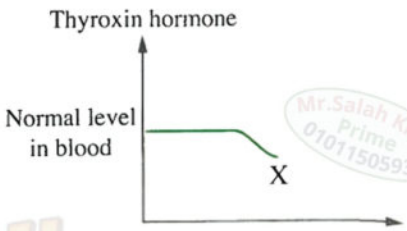
.....



2 The opposite figure shows : The level of hormone secreted by thyroid gland in the blood.

What is the disease result from reaching the level of secretion of hormone at point (X) ?

.....



3 From the opposite figure :

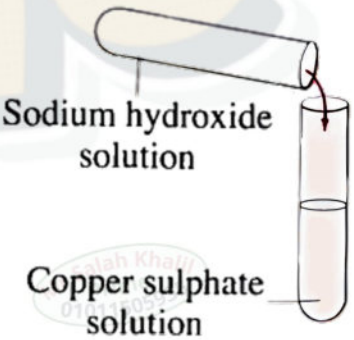
How can you measure the speed of this reaction practically ?

With writing the balanced symbolic chemical equation that represents this reaction.

.....

.....

.....



6 Give a reason for the following :

Playing basketball isn't hereditary

.....

.....

7 What happens if ...?

More charges pass per second

.....

.....

Section 11

1 Choose the correct answer:

1. All the following elements replace hydrogen of diluted acid except.....
   (a) Al (B) Zn (C) Hg (D) Pb
2. ..... consists of two lobes located in the front surface of the neck on both sides of the trachea.
   (a) The adrenal gland (B) The pituitary gland (C) The Thyroid gland (D) The pancreas gland
3. During cases of emergencies, the secretion of ..... hormone increases.
   (a) thyroxin (B) adrenalin (C) growth (D) estrogen
4. According to the chemical activity series, zinc is more active than.....
   (a) iron (B) sodium (C) magnesium (D) potassium

2 Complete the following statements :

1. The traits that are not transmitted from one generation to another are called ..... traits.
2. When magnesium replaces copper in its salt solution a precipitate its color is .....is formed.
3. Most metals..... decompose to ..... and sulpher trioxide.
4. The reaction of covalent compounds are ..... than of the ionic compounds.
5. Chemical reactions is..... in the reactant molecules, and in the..... products molecules.

3 put (✓) or (x) for each statement :

1. The resence of check dimples is from dominant traits. ( )
2. In reaction between magnesium and copper sulphate solution, magnesium is considered a reducing agent. ( )
3. On adding table salt powder to crystals of silver nitrate, a white precipitate of silver chloride is formed. ( )

4 Write the scientific term or define the following as required:

1. Radiation-induced changes in chromosomes (.....)
2. Cellular effects : .....
3. Atoms with same protons but different neutrons (.....)

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5 Various questions

1 Correct the underlined words :

1. Sodium nitrate decomposes by heating, and Nitrogen gas evolves.
2. Aluminium reacts with dilute hydrochloric acid after a period of time due to the presence of Aluminium chloride layer.
3. The maximum safe dose of nuclear radiation for the public should not exceed 30 Sievert per year.
4. The measuring unit (ohm. Ampere^2. Second) is the measuring unit of the electric potential difference.
5. On adding piece of magnesium to copper sulphate solution black precipitates is formed.
6. Each chromosome produce a special enzyme which is responsible for producing a type of protein.
7. Oxygen gas detected by changes limewater into turbid.
8. Hormones are secreted in the body by some organs called ductile glands
9. Dwarfism disease results from decrease of secretion in the insulin hormone at the childhood
10. The Ammeter is connected in parallel in the electric circuit.
11. The attached ear lobe from dominant hereditary trait.
12. Estrogen promotes the growth of endometrium
13. The electromotive forcetof three similar cells connected in parallel is twice the electromotive force of one cell.
14. In the circuit of the direct current, molecules flow from one of the two poles to the other in the electrochemical cell.
15. From the military uses of nuclear energy in the medical field, diagnosis and treatment of some diseases.
16. Mendel removed the petals of pea plant flowers to prevent self-pollination.
17. The electron is considered an energy store in the atom.
18. The difference between the mass of manganese dioxide to its mass after ending the chemical reaction of decomposition of hydrogen peroxide equal whole one.

6 Give a reason for the following :

Mendel chose pea plants

.....

.....

7 What happens if ...?

Ohm's circuit has no variable resistor

.....

.....

Section 12

1 Choose the correct answer:

1 The law of independent assortment of hereditary factors is known as .....law

a Mendel's first B Mendel's second C Ohm's D Badel and Tatum

2 Parts of DNA present on the chromosomes are called the .....

a genes B cytoplasm C chromatids D nucleus

3 An alternating current could be obtained from a (an).....

a rheostat B ohmmeter C dynamo D ammeter

4 Mendel removed the ..... of pea flowers to avoid self-pollination.

a petals B stamens C carpels D sepals

2 Complete the following statements :

1 Nitrogen pentaoxide breaks up into..... gas and ..... gas

2 The chromosome is chemically consists of a nucleic acid called .....combined with .....

3 The ..... is used to measure the electromotive force of a battery

4 the voltmeter is connected to the electric circuits in.....and ammeter is connected in.....

5 When the amount of iodine in food decreases , the secretion of.....hormone decreases from ..... gland.

3 put (✓) or (x) for each statement :

1 Hydrogen peroxide decomposes into water and hydrogen. ☐

2 Most metal carbonates decompose by heat into metal oxide and carbon dioxide. ☐

3 Direct electric current is used in lighting houses and streets. ☐

4 Write the scientific term or define the following as required:

1 Current ∝ Voltage when temperature is constant. (.....)

2 Chemical reaction : .....

3 Current in one direction (.....)

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5 Various questions

1 Write the number indicating each of the following :

1. The number of genetic traits that Mendel chose for the pea plant when conducting his experiments.
2. The value of the potential difference resulting from the contact of two conductors with the same electrical potential.
3. The number of electric cells that make up a battery with an electromotive force of 9 volt. knowing that all the cells are connected in series and the electromotive force of one pole = 1.5 volt.
4. The number of types of gametes produced by an individual with a given genotype (TtRr).

2 Mention one use or importance for each of the following :

1. Nuclear binding forces.
2. The chemical reaction for plants.
3. Ohmmeter.
4. The catalytic converter in modern cars.
5. Pituitary gland.
6. Adrenalin hormone.
7. Variable resistance (sliding rheostat).
8. Oxidase enzyme in potatoes.
9. Dynamo.
10. Voltmeter device.

6 Give a reason for the following :

Generators produce AC

.....

.....

7 What happens if ...?

Chlorine gains electron

.....

.....

Section 13

1 Choose the correct answer:

1. On connecting 5 electric cells have the same electromotive force on parallel, the e.m.f of each cell is 2.5 volts, so the total e.m.f equals .....volts.

(a) 2.5 (B) 5 (C) 7.5 (D) 12.5

2. A gene controls the appearance of the genetic trait by producing.....

(a) Hormone (B) Enzyme (C) Chromosome (D) no correct answer

3. Cosmic radiation is from..... sources of radiation pollution.

(a) natural (B) artificial (C) industrial (D) no correct answer

4. Alternating current is used in .....

(a) electrolysis (B) lighting house (C) electroplating (D) both a & c

2 Complete the following statements :

1. natural .....elements like rubidium, the atom's nuclei of these element contain number of .....more than the number required for its stability.
2. to respond to emergencies adrenal gland secretes .....hormone.
3. The measuring unit for nuclear radiation is.....
4. During the chemical reaction, the concentration of reactants gradually ..... whereas the concentration of products gradually .....
5. Sweet potato contains .....enzyme which helps in decomposition of hydrogen peroxide.

3 put (✓) or (x) for each statement :

1. Target cells are usually located near the gland that secretes the hormone targeting them. ☐
2. The presence of check dimples is a recessive trait. ☐
3. Iodine is a component of the hormone thyroxine. ☐

4 Write the scientific term or define the following as required:

1. Resistance that can be adjusted (.....)
2. Artificial radioactivity : .....
3. One element replaces another in a compound (.....)

5 Various questions

1 Cross out the odd word in the following :

1. Sodium nitrate solid – Sodium chloride solid – Copper sulphate solid – Copper hydroxide solid.
2. Na – Cu –Pt – Ag.
3. TTRr – TTRR – TtRr – ttrr.
4. Chromosome - DNA - Protein - HCl acid.
5. Presence of dimples – Free ear lobe – Presence of freckles – Wide eyes.
6. Uranium – Cesium – Barium – Radium.
7. Nature of reactants – Temperature of the reaction – Concentration of the products - Catalysts.
8. Copper – Silver – Sodium – Gold.
9. No freckles – Wide eyes – Smooth hair – Presence of dimples.
10. Difficult to be cultivated – Short life cycle – Easily artificially pollinated – Its flowers are Hermaphrodite.
11. Pituitary gland – Salivary gland – Thyroid gland – Two adrenal glands.
12. Voltmeter – Ammeter – Ohmmeter – Ampere.
13. Drivine a car – Speaking English – Children learning how to walk – Skin colour.
14. Adrenalin – Estrogen – Testosterone – Progesterone.
15. Mg - Zn -Cu - Na
16. Exophthalmoses – Loss of weight – Tension – Continuous growth in the limb's bones.
17. Pressure – Potential difference – Current intensity – Electric resistance.
18. Flowers of pea plant are hermaphrodite – Difficult to be planted – Life cycle is short – Easily artificially pollinated.
19. Increase percentage of oxygen – A process of losing an electron or more – Decrease oxygen percentage – Decrease hydrogen percentage.
20. Positive catalyst – Hydrogen peroxide – Oxidase enzyme – Manganese dioxide.

6 Give a reason for the following :

No current flows if conductors have same potential

.....

.....

7 What happens if ...?

Reactants are broken up

.....

.....

Section 14

1 Choose the correct answer:

1 We can control the value of the electric resistance by using.....

a ammeter B voltmeter C rheostat D ohmeter

2 The radiologist should not be exposed to radiation in amounts more than…….. milli sievert per year.

a 5 B 10 C 15 D 20

3 To transfer an electric charge of 10 coulombs between two points with a potential difference of 20 volts between them, the work done to transfer it is equal ……Joules

a ½ B 2 C 20 D 200

4 The substance that decrease the reaction rate and does not change is called……..

a Oxidizer B Reductant C Positive catalyst D Negative catalyst

2 Complete the following statements :

1 The reactions of covalent compounds are slower because they take place between .....

2 The.....current can be transferred on short distances only, while the .....current can be transferred for short and long distances

3 In human, the traits of the blue narrow eyes are considered as .....traits.

4 The pea plant is characterized by it can be easily.....and its short life cycle.

5 The ability to roll the tongue is one of the ..... traits, while the attached ear lobe is one the ..... traits in the human.

3 put (✓) or (x) for each statement :

1 The e.m.f of several cells which are connected in series is equal to the e.m.f of one cell. ☐

2 The unit of measurement of the amount of electric charge is amperes × seconds . ☐

3 The spleen is damaged, on exposing the human for a large dosage through short period of time. ☐

4 Write the scientific term or define the following as required:

1 Catalyst increases speed (.....)

2 Reaction speed : .....

3 Metal ranking by reactivity (.....)

5 Give a reason for the following :

Enzymes affect traits

.....

.....

500,000 people lose sight yearly

.....

.....

Parents with free ear lobe can have child with attached lobe

.....

.....

6 What happens if ...?

Add dilute HCl to copper

.....

.....

Add dilute HCl to zinc

.....

.....

Add magnesium to blue copper sulphate

.....

.....

Section 15

1 Choose the correct answer:

1 When copper sulphate is heated, a .....color is formed.

(a) black (B) green (C) blue (D) red

2 The hormone that promotes the growth of endometrium is the..... hormone.

(a) Testosterone (B) progesterone (C) estrogen (D) growth

3 Sever damage of..... gland, may cause death.

(a) parathyroid (B) thyroid (C) ovary (D) pituitary

4 ……element shares in composing thyroxin hormone.

(a) Iodine (B) Iron (C) Sodium (D) Calcium

2 Complete the following statements :

1 $Fe^{+2} \rightarrow Fe^{+3}$, This process is called ..... .

2 Aluminium reacts with dilute hydrochloric acid after a period of time due to the presence of a layer of.....

3 ..... hormone responsible for the appearance of secondary sexual characteristics in females.

4 Sodium nitrate decomposes with heat, and ..... gas is released.

5 The genetic structure of a tall pea plant with pure red flowers is .....

3 put (✓) or (x) for each statement :

1 Oxidation and reduction reactions occur separately from each other ☐

2 The scientist Johansen used the term gene instead of genetic factor. ☐

3 The hexagonal ceramic cells used in catalytic converter to decrease the exposed surface area of reaction. ☐

4 Write the scientific term or define the following as required:

1 Complete gene map of human chromosomes. (.....)

2 Simple goiter : .....

3 Appears only with two recessive genes (.....)

5 Give a reason for the following :

Adrenal glands help in emergencies

.....

.....

Pancreas is a mixed gland

.....

.....

Insulin treats diabetes

.....

.....

6 What happens if ...?

Effervescent tablets in hot vs. cold water

.....

.....

Heat copper carbonate

.....

.....

Heat blue copper sulphate

.....

.....

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Section 16

1 Choose the correct answer:

1 DNA molecule consists of …….. strands.

a 2 B 3 C 6 D 7

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

a 7 B 6 C 5 D 8

3 The trait ..... is always pure.

a Acquired B Genetic C Dominant D Recessive

4 Which one of these traits is recessive in humans?

a Curly hair B Wide eyes C Free ear lobe D Straight hair

2 Complete the following statements :

1 .....folded inside the steering wheel of modern cars as a safety tool during accidents.

2 ..... is the physical quantity whose measuring unit is volt/ampere.

3 The two factors of a genetic trait are identical in a ..... individual. الأسئلة اللي بتتكرر مهمه

4 ..... gas turbid the clear lime water , while ..... gas increases the glowing splint

5 When hydrogen gas is passed over hot copper , the copper turns into.....

3 put (✓) or (x) for each statement :

1 The genes control the appearance of hereditary traits of the living organism by producing vitamins. ☐

2 In Rheostat, if the length of the wile increases, the resistance increases and the current intensity increases. ☐

3 On heating copper hydroxide, its colour changes from blue to green. ☐

4 Write the scientific term or define the following as required:

1 Disease from low insulin, causing high blood sugar. (.....)

2 Gigantism : .....

3 Short stature from low growth hormone in childhood. (.....)

5 Give a reason for the following :

Self-pollinated several generations

.....

.....

First law: segregation

.....

.....

Green color disappeared

.....

.....

6 What happens if ...?

Food left in summer outside fridge

.....

.....

Replace iron filings with iron piece

.....

.....

Increase surface area exposed to reaction

.....

.....

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Section 17

1 Choose the correct answer:

1. The two factors of a hereditary trait are similar in the..... individual.
   (a) pure (B) hybrid (C) recessive (D) (a) and (c)
2. Genetically modified rice contains.....
   (a) Vitamin A (B) Folic acid (C) Carotene (D) Melanin
3. The genotype of a pea plant with wrinkled, yellow seeds is.....
   (a) yyRR (B) YYRR (C) yyrr (D) YYrr
4. The genetic structure of a short-stemmed, white-flowered pea plant is .....
   (a) ttTT (B) TTrr (C) ttrr (D) TTRR

2 Complete the following statements :

1. At the end of the complete chemical reaction , the concentration of the reactants is ..... and the concentration of the products is ..... %
2. When mating a male and a female with their genetic makeup (Bb)), the ratio of hybrid individuals to the ratio of the resulting pure individuals are ..... : .....
3. Hormones are directly secreted into the blood stream by.....
4. In a state of emotion, the secretion of the .....hormone increases.
5. When the quantity of charge increase to double and the time of its passing decrease to half, the current intensity in the electrical circuit will.....

3 put (✓) or (x) for each statement :

1. In the reaction of hydrogen with hot copper oxide, hydrogen plays the role of a reducing agent. ( )
2. The skill of playing football and speaking different languages are traits that cannot be transferred from one generation to another. ( )
3. The protein responsible for the appearance of brown eyes is no different from the protein responsible for the appearance of curly hair. ( )

4 Write the scientific term or define the following as required:

1. One trait appears in the first generation; both traits appear in a 3:1 ratio in the second. (.....)
2. Mendel's 2nd law (Independent assortment) : .....
3. Study of heredity (.....)

5 Give a reason for the following :

In H_2 + CuO, hydrogen is a reducing agent

.....

.....

In 2Na + Cl_2, sodium is a reducing agent

.....

.....

Oxidation and reduction happen together

.....

.....

6 What happens if ...?

Crossing two pure plants with two contrasting traits

.....

.....

Resistance burnt during Ohm's Law experiment

.....

.....

Cells connected in series

.....

.....

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Section 18

1 Choose the correct answer:

1 The chemical composition of a chromosome is DNA and .....

(a) Carbohydrates (B) Water (C) Fats (D) Protein

2 The nuclear energy is peacefully used in the industrial field to convert sand to for ..... manufacturing computer processors.

(a) electric energy (B) atomic bombs (C) nuclear fuel (D) silicon sheets

3 Rockets use ..... fuel for flying.

(a) gasoline (B) kerosene (C) natural gas (D) nuclear

4 .....is a non-radioactive element.

(a) Radium (B) Iron (C) Uranium (D) Zerconium

2 Complete the following statements :

1 When approaching a burning match to a.....gas, it burns with a pop sound.

2 During the chemical reaction, the number of lost electrons in oxidation process is..... the number of gained electrons in reduction process.

3 The electromotive force of three identical columns connected in parallel..... the electromotive force of one column.

4 The..... individual carries a gene of the dominant trait and another of the recessive trait.

5 The reaction of sulphuric acid solution with potassium hydroxide solution is .....reaction.

3 put (✓) or (x) for each statement :

1 The lateral flower position is the dominant characteristic of pea plants. ☐

2 The reaction of oil with caustic soda is considered a very rapid reaction ☐

3 The genetic structure of wrinkled green coloured seeds of a pea plant is RrGg. ☐

4 Write the scientific term or define the following as required:

1 Converts mechanical to electric energy (.....)

2 Hormone disorder :.....

3 Substance changing reaction rate without being used up (.....)

5 Give a reason for the following :

Ionic reactions are fast, covalent reactions are slow

.....

.....

$NaCl + AgNO_3$ is a fast reaction

.....

.....

Iron filings react faster than iron blocks

.....

.....

6 What happens if ...?

Mating 50% dominant & 50% recessive

.....

.....

Dominant gene with recessive gene

.....

.....

Cross-pollinating yellow pods × green pods

.....

.....

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Section 19

1 Choose the correct answer:

1. The radioactive phenomenon was discovered by the scientist.....
   (a) Ohm (B) Volt (C) Becquerel (D) Ampere
2. In dynamo, ... energy is converted into electric energy.
   (a) Kinetic (B) Magnetic (C) light (D) Chemical
3. If the electric current passing through an electrical resistance of 5 ohms doubles, the resistance value will be: .....
   (a) 5 ohms (B) 10 ohms (C) 40 ohms (D) 20 ohms
4. The product of the intensity of the current flowing in a conductor and the time of flow of this current produces a physical quantity measured in units of .....
   (a) ampere (B) coulomb (C) ohm (D) volt

2 Complete the following statements :

1. When sodium chloride solution reacts with silver nitrate solution, a white precipitate is formed of.....
2. The genetic structure AABB forming ..... types of gametes.
3. The only way for reaching the hormone to the target cells is .....
4. The physical quantity which its measuring unit equivalent joule / Volt. second is .....
5. The percentage of gametes (TR) in a plant whose genetic structure is (TtRr) is equal ..... % according to Mendel's second law.

3 put (✓) or (x) for each statement :

1. The presence of check dimples in human is a recessive trait. ( )
2. The pollination between two hybrid pea plants of red flowers (Rr), the quarter of produced plants has red flowers. ( )
3. The substance of sodium azid inside the airbag decomposes in presence of electric spark into sodium and evolving carbon dioxide gas CO_2 ( )

4 Write the scientific term or define the following as required:

1. Acid + base → salt + water. (.....)
2. Double substitution : .....
3. Opposition to current flow (.....)

5 Give a reason for the following :

Black substance forms by heating green copper carbonate

.....

.....

Blue copper sulphate turns black by heating

.....

.....

Yellowish white colour forms from heating white sodium nitrate

.....

.....

6 What happens if ...?

Tall red × short white pea plants

.....

.....

Mating two individuals with rolling tongue trait

.....

.....

If gene fails to produce enzyme

.....

.....

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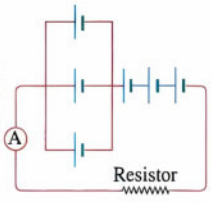
Section 20

1 Choose the correct answer:

1 If the Attraction force between nucleus and electrons is vanished, electrons will become .....

(a) localized (B) static (C) free (D) all the pervious

2 In the opposite electric circuit, if the electromotive force for each electric cell is 2 volts and the electric resistance is 4 ohms, the ammeter reading will be ..... amperes.

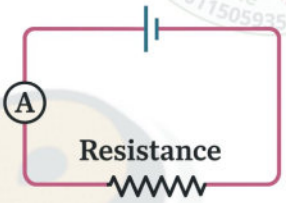


(a) 8 (B) 6 (C) 4 (D) 2

3 If the amount of electricity passing through a conductor is reduced to half, then the intensity of the electric current is ..... at a constant time

(a) decreases by half (B) increases by double (C) increases by four times (D) does not change

4 In the opposite circuit, the electric resistance equals 8 ohms. If the potential difference between its two ends is doubled, the value of this resistance will be ..... ohms.



(a) 16 (B) 8 (C) 4 (D) 2

5 The measuring unit of concentration is .....

(a) mole.litre. (B) mole/litre. (C) mole. Sec. (D) mole/second.

2 Complete the following statements :

1 The .....hormone controls the level of calcium in the blood.

2 Mendel choose the ..... plant to conduct his experiments.

3 Ionic compounds are fast in their reaction because they decompose into .....

4 The reactions of ionic compounds are .....than that of the covalent compounds.

5 The maximum safe dose of nuclear radiation for a radiologist is ..... milli Sievert per year.

3 put (✓) or (x) for each statement :

1 Mendel choose ten hereditary traits in the pea plant to perform his experiment ☐

2 Most metal carbonates decompose by heating into metal and carbon dioxide. ☐

3 Ohmmeter is used to measure the current intensity. ☐

4 Write the scientific term or define the following as required:

1 The hormone which is responsiblegfortheappearance of the male secondary sex characteristics (.....)

5 Give a reason for the following :

The fridge preserves food

.....

.....

Catalysts are used in chemical reactions

.....

.....

Manganese dioxide speeds up gas release in hydrogen peroxide

.....

.....

6 What happens if ...?

Doubling voltage at constant temperature

.....

.....

Add MnO_2 to hydrogen peroxide

.....

.....

Crossing two pure plants with two contrasting traits

.....

.....

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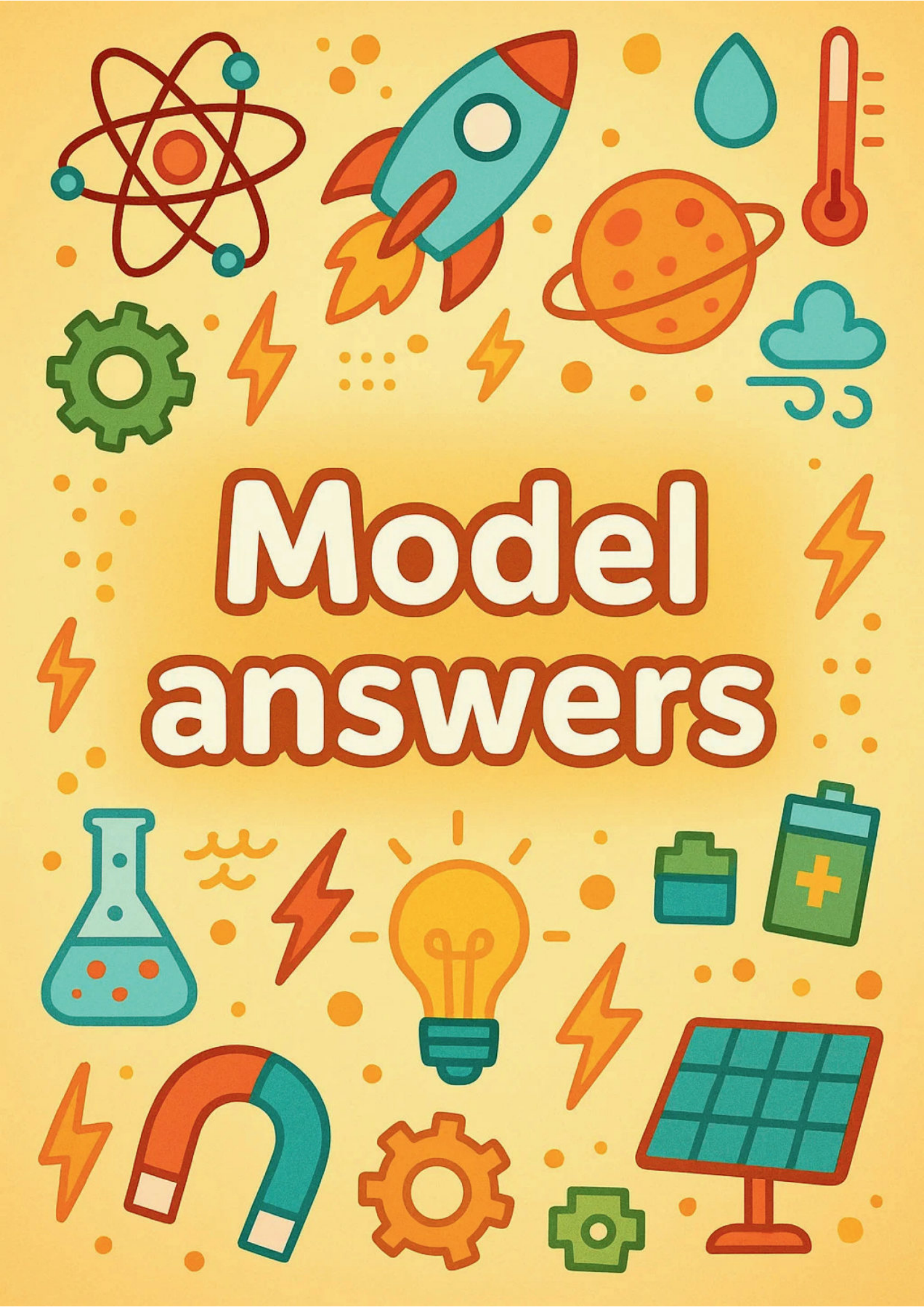

Model answers

model answers

Section 1

1 Choose the correct answer:

1. b
2. c
3. a
4. c

2 Complete the following :

1. inversly
2. ampere
3. thermal decomposition
4. endocrine glands
5. hormones – cells

3 put (✓) or (x) :

1. x
2. ✓
3. x

4 Write the scientific term :

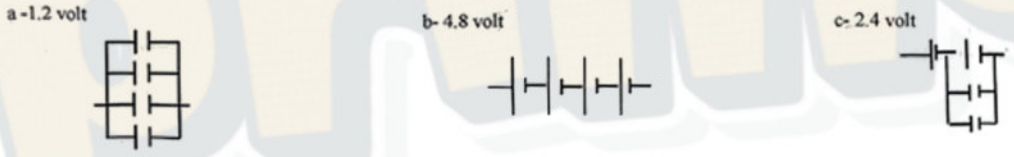
1-chemical reaction

2-Chemical process where atom gains one or more electron.

3-electricity

5 Various questions

(1)



(2)

1-2HgO

2- $2NaNO_2$

3- HCl

(3)

the air bag in cars is dew signed on the occurrence of the car crash they get vacuumed and sodium nitride decomposes forming nitrogen that fills the air' bag on crashing. ($2Na_3N = 2Na+3N_2$)

6 Give a reason for the following :

- Because it doesn't cause pollution.

7 What happens if ...?

- Blood would not be the only way to transport hormones.

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Section 2

1 Choose the correct answer:

1. d
2. b
3. c
4. b

2 Complete the following :

1. lose
2. beadle and Tatum
3. thyroxin and calcitonin
4. oxidizing
5. higher – lower

3 put (✓) or (x) :

1. ✓
2. x
3. x

4 Write the scientific term :

1-pititary gland

2-Resistance allowing 1 ampere with 1 volt difference.

3-Diabetes

5 Various questions

(1)

metal oxide gives oxygen but metal hydroxide gives water vapour

(2)

$Zn \rightarrow Zn^{+2}$ oxidation process

$Cr^{+3} \rightarrow Cr$ reduction process

$Cr^{+3} \rightarrow$ oxidizing factor

$Zn \rightarrow$ reducing factor

(3)

$I = V/R = 220/2200 = 0.1$ ampere

$Q = I \times t = 0.1 \times (2 \times 60) = 12$ coulomb

(4)

in case of the connection of electric cells in series the electromotive increases and in case of parallel the value of produced electromotive force still as it is

(5)

Due to evolving of hydrogen gas

6 Give a reason for the following :

- Because they are attracted by the nucleus.

7 What happens if ...?

- The person suffers from exophthalmic goiter.

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Section 3

1 Choose the correct answer:

1. a
2. b
3. a
4. c

2 Complete the following :

1. Weston and crick
2. somatic mutation and gamete mutation
3. neutralization
4. kinetic – electric energy
5. insulin – glucagon

3 put (✓) or (x) :

1. ✓
2. ✓
3. x

4 Write the scientific term :

1- The gene

2- is the quantity of electricity that pass in a wire in one second.

3- hormone disorder

5 Various questions

(1)

1- simple substitution reaction

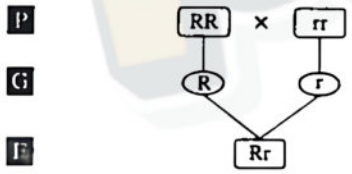
2- double substitution reaction

3- simple substitution reaction

(2)

1- I = 12x 0.5/6= 1 ampere

2-



100 % Hybrid red flowers

(3)

• NO2 - O2

6 Give a reason for the following :

• Because wide eyes gene is stronger.

7 What happens if ...?

• Thyroxin secretion decreases, leading to simple goiter.

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Section 4

1 Choose the correct answer:

1. b
2. d
3. c
4. c

2 Complete the following :

1. water vapour
2. chemical reactions
3. concurrent
4. direct – alternating
5. insulin

3 put (✓) or (x) :

1. ✓
2. ✓
3. x

4 Write the scientific term :

1- Endocrine gland

2- Trait that disappeared in the first generation.

3- Simple substitution reaction

5 Various questions

(1)

(A) CuO ---- (B) Cu

(2)

1- In circuit no. (1) indicates the measuring of the electromotive force of the battery.

2-In circuit no. (2) indicates the measuring of the potential difference of the circuit.

(3)

1. $CuCO_3$ - CuO

2. oxidation — reduction

(4)

1. Pancreas.

2. in case of increase of glucose in blood, pancreas secretes insulin hormone, while in case of decrease of glucose in blood, pancreas secretes glucagon hormone.

6 Give a reason for the following :

- Because current is proportional to voltage across the conductor.

7 What happens if ...?

- Offspring will be 100% hybrid dominant

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Section 5

1 Choose the correct answer:

1. a
2. b
3. b
4. a

2 Complete the following :

1. inversely
2. slow
3. segregate
4. negative
5. dominant

3 put (✓) or (x) :

1. x
2. ✓
3. ✓

4 Write the scientific term :

1- Gametes

2- Chemical reactions in which a catalyst speeds up their rate.

3- Salt and water

5 Various questions

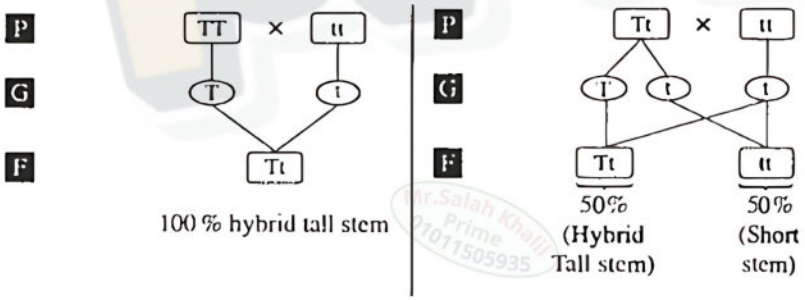
(1)

1- A - it's atoms' nucleus contain a number of neutrons more than the number required for its stability.

2- 5 ampere / B → A.

(2)

By mating with pea plant that has short stem.



(3)

- Insulin hormone : It stimulates the storage of glucose sugar in the liver.
- Glucagon hormone : It stimulates the release of glucose sugar from the liver.

6 Give a reason for the following :

- Because bone marrow gets damaged and can't produce them

7 What happens if ...?

- No current flows; ammeter = 0, voltmeter = e.m.f of battery.

Section 6

1 Choose the correct answer:

1. d
2. b
3. c
4. b

2 Complete the following :

1. agricultural
2. pure
3. Joule
4. sodium nitrate – oxygen gas
5. sodium sulphate – copper hydroxide

3 put (✓) or (x) :

1. ✓
2. ✓
3. x

4 Write the scientific term :

1- Voltmeter

2- The measuring unit for absorbed nuclear radiation.

3- Rheostat

5 Various questions

(1)

1 . 3.6 volt.

2. 4.8 volt - when connecting all cells in series.

(2)

1.A → CuO , B → H_2

2. Oxidation - reduction ,C → Cu

(3)

First : 1. $2N_2O_5 \rightarrow 4NO_2 + O_2$ / 2. quarter

6 Give a reason for the following :

- Because it contains genes.

7 What happens if ...?

- e.m.f equals e.m.f of one cell

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Section 7

1 Choose the correct answer:

1. c
2. a
3. b
4. c

2 Complete the following :

1. Henri Becquerel – Uranium
2. salt of and acid – hydrogen gas
3. coulomb – ampere. second
4. relatively slow
5. away from

3 put (✓) or (x) :

1. ✓
2. x
3. ✓

4 Write the scientific term :

1- The principle of complete dominance

2- Thy trait that appears in all individuals of the first generation in Mendel's experiment.

5 Various questions

(1)

1. Adrinal gland.
2. Adrinalin hormone : It stimulates body's organs to respond to emergencies.

(2)

1. The length of the rheostat wire decreases.
2. R = 20/5 = 4 Ohm.– $V_2 = 4 \times 8 = 32$ Volt

(3)

1. 1: H_2O_2 2: O_2 3: H_2O
2. Manganese dioxide.

6 Give a reason for the following :

- Because it adjusts the voltage to a suitable level.

7 What happens if ...?

- Female secondary sex characteristics won't appear.

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Section 8

1 Choose the correct answer:

1. d
2. a
3. c
4. a

2 Complete the following :

1. underground water – earthquakes and volcanoes
2. simple cell (dry cell)
3. oxidase enzyme – increase
4. self pollination
5. Cl_2

3 put (✓) or (x) :

1. ✓
2. ✓
3. x

4 Write the scientific term :

1- Thermal decomposition reaction

2- A disease that occurs due to the increase in the secretion of the thyroxin hormone.

3- Growth hormone

5 Various questions

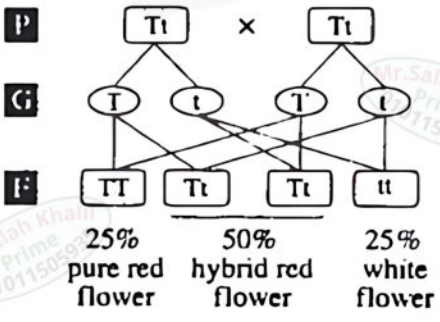
(1)

- Parents : Bb x Bb
- Resulting plants : BB , Bb , Bb , bb

(2)

1. B - 2. Pancreas.

(3)



6 Give a reason for the following :

- Because it doesn't contain carotene to make Vitamin A.

7 What happens if ...?

- May damage bone marrow, spleen, digestive, nervous system.

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Section 9

1 Choose the correct answer:

1. a
2. b
3. a
4. b

2 Complete the following :

1. reproductive glands
2. decrease – doesn't change
3. increase
4. increase
5. very fast

3 put (✓) or (x) :

1. ✓
2. ✓
3. x

4 Write the scientific term :

1- Air bag

2- A chemical messenger that controls body functions

3- Hybrid individual

5 Various questions

(1)

1. Hydrogen gas.
2. Simple substitution reaction.
3. $ZnCl_2$

(2)

1. chromosome / 2. DNA

(3)

1. (2)
2. surface area — concentration of reactants.

6 Give a reason for the following :

- Because it changes resistance in the circuit.

7 What happens if ...?

- Reaction rate increases

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Section 10

1 Choose the correct answer:

1. c
2. a
3. d
4. b

2 Complete the following :

1. Genom
2. potential difference
3. dry cell
4. clear limewater
5. Gametes

3 put (✓) or (x) :

1. ✓
2. ✓
3. ✓

4 Write the scientific term :

1- Dominant gene

2- Thyroid swelling from low thyroxin

3- Potential difference

5 Various questions

(1)

1 . Using magnesium filings or concentrated hydrochloric acid.

2. H^+

(2)

Simple goiter.

(3)

The speed of this reaction is measured practically by:

- The disappearance rate of the blue color of copper sulphate solution.

Or

- The rate of formation of the blue precipitate of copper hydroxide.

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

6 Give a reason for the following :

- Because it's learned, not inherited.

7 What happens if ...?

- Current intensity increases

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Section 11

1 Choose the correct answer:

1. c
2. c
3. b
4. a

2 Complete the following :

1. acquired
2. Red
3. sulphate – metal oxide
4. slower
5. breaking – formation

3 put (✓) or (x) :

1. ✓
2. ✓
3. ✓

4 Write the scientific term :

1- Genetic effects

2- Damage or death of cells from radiation

3- Isotopes

5 Various questions

(1)

1. oxygen
2. aluminium oxide
3. 1 milli
4. work done.
5. Red
6. Gene
7. Carbon dioxide
8. Endocrine
9. Growth
10. Voltmeter
11. Free
12. Progesterone
13. Equal
14. Electrons
15. Medical
16. Stamens
17. Nucleus
18. zero.

6 Give a reason for the following :

- Because they grow fast, self-pollinate, and show clear traits.

7 What happens if ...?

- Can't verify Ohm's law.

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Section 12

1 Choose the correct answer:

1. b
2. a
3. c
4. b

2 Complete the following :

1. NO_2 – O_2
2. DNA – Protein
3. Voltmeter
4. parallel – series
5. Thyroxin – thyroid

3 put (✓) or (x) :

1. x
2. ✓
3. .x

4 Write the scientific term :

1- Ohm's law

2- Breaking and forming of chemical bonds

3- Direct current (D.C.)

5 Various questions

(1)

- 1.(7)
- 2. zero.
- 3. 6 electric poles.
- 4. (4)

(2)

1.

- Binding the nucleus components together.
- Overcoming the repulsion forces that are present between the positively charged protons and each others.

2. Making food in plants.

3. It is used for measuring the electric resistance.

4. It is used to treat the harmful gases emitted from the engine.

5. It secretes hormones that regulate the activities of most of other endocrine glands, so it is called the master gland or the main gland.

6. It stimulates body's organs to respond to emergencies.

7. It is used to control the current intensity and potential difference in the electric circuit.

8. It is used to increase the speed of decomposition of hydrogen peroxide into water and oxygen.

9. It changes the kinetic energy into electric energy and produces alternating current.

10. It is used to measuring the potential difference across two ends of a conductor.

6 Give a reason for the following :

- Because it's suitable for appliances and can be changed to DC.

7 What happens if ...?

- It becomes chloride ion and acts as oxidizing agent.

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Section 13

1 Choose the correct answer:

1. a
2. b
3. a
4. b

2 Complete the following :

1. Radioactive – neutrons
2. Adrenaline
3. sievert
4. decrease – increase
5. oxidase

3 put (✓) or (x) :

1. x
2. x
3. ✓

4 Write the scientific term :

1- Variable resistance
2- Radiation from nuclear reactions/bombs
3- Simple substitution

5 Various questions

(1)

1. sodium chloride
2. 2.Na
3. ttrr
4. HCl
5. Presence of freckles
6. Barium
7. Concentration of the products
8. Sodium.
9. Smooth hair.
10. Difficult to be cultivated.
11. Salivary gland.
12. Ampere
13. Skin colour
14. Adrenalin.
15. Cu
16. Continuous growth in the limb's bones.
17. Pressure
18. Difficult to be planted.
19. Decrease oxygen percentage
20. Hydrogen peroxide

6 Give a reason for the following :

- Because there is no potential difference.

7 What happens if ...?

- Surface area increases, so reaction speeds up.

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Section 14

1 Choose the correct answer:

1. c
2. d
3. d
4. d

2 Complete the following :

1. molecules
2. direct – alternating
3. recessive
4. planted
5. dominant – recessive

3 put (✓) or (x) :

1. x
2. ✓
3. ✓

4 Write the scientific term :

1- Positive catalytic reaction

2- Change in concentration over time

3- Activity series

5 Give a reason for the following :

1-Because genes produce special enzymes that show traits.

2-Because of Vitamin A deficiency.

3-Because both may carry the recessive gene.

6 What happens if ...?

1- No reaction occurs

2- Zinc reacts + hydrogen gas evolves

3- Blue disappears + red copper precipitates

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Section 15

1 Choose the correct answer:

1. a
2. b
3. d
4. a

2 Complete the following :

1. oxidation
2. Aluminium oxide
3. estrogen
4. oxygen
5. TTRR

3 put (✓) or (x) :

1. x
2. ✓
3. X

4 Write the scientific term :

1- Human genome

2- Thyroid swelling from low thyroxin

3- Recessive trait

5 Give a reason for the following :

1-Because they release adrenaline

2-Because it secretes both hormones and enzymes.

3-Because it lowers blood sugar.

6 What happens if ...?

1- Faster reaction in hot water

2- Black copper oxide + CO_2 gas form

3- Black copper oxide + SO_3 gas form

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Section 16

1 Choose the correct answer:

1. a
2. a
3. d
4. d

2 Complete the following :

1. Airbag
2. electric resistance
3. pure
4. CO_2 – O_2
5. red copper metal

3 put (✓) or (x) :

1. x
2. x
3. X

4 Write the scientific term :

1- Diabetes

2- Excessive height from high growth hormone in childhood.

3- Dwarfism

5 Give a reason for the following :

1-to ensure trait purity.

2-Because genes separate during gamete formation.

3-Because it's recessive.

6 What happens if ...?

1- It rots due to faster bacterial reactions

2- Reaction rate decreases

3- More collisions → faster reaction

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Section 17

1 Choose the correct answer:

1. a
2. a
3. d
4. c

2 Complete the following :

1. zero – 100
2. 2 : 2
3. endocrine glands
4. adrenaline
5. increase four times

3 put (✓) or (x) :

1. ✓
2. ✓
3. X

4 Write the scientific term :

1- Mendel's 1st law (Segregation):

2- Traits pass independently with a 3:1 ratio.

3- Genetics

5 Give a reason for the following :

1-Because it removes oxygen from copper oxide.

2-Because it loses an electron and chlorine gains it.

3-Because electrons lost in oxidation are gained in reduction.

6 What happens if ...?

1- Offspring carry dominant traits only (3:1 in second gen).

2- No current flows; ammeter = 0, voltmeter = e.m.f of battery.

3- e.m.f increases

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Section 18

1 Choose the correct answer:

1. d
2. d
3. d
4. b

2 Complete the following :

1. hydrogen
2. equal to
3. equal to
4. hybrid
5. neutralization

3 put (✓) or (x) :

1. ✓
2. x
3. X

4 Write the scientific term :

1- Electric generator

2- The result when one of the endocrine glands does not work properly.

3- Catalyst

5 Give a reason for the following :

1-Because ionic reactions occur between ions while covalent reactions occur between molecules.

2-Because it involves ions formed in water solution.

3-Because they have larger surface area.

6 What happens if ...?

1- Dominant individuals will be hybrids.

2- The dominant hides the recessive

3- All offspring will have green pods

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Section 19

1 Choose the correct answer:

1. c
2. a
3. a
4. b

2 Complete the following :

1. AgCl
2. one
3. the blood
4. current intensity
5. 25%

3 put (✓) or (x) :

1. x
2. x
3. X

4 Write the scientific term :

1- Neutralization

2- Two compounds exchange ions to form new ones

3- Resistance

5 Give a reason for the following :

1-Because it decomposes into copper oxide and carbon dioxide.

2-Because it decomposes into copper oxide and sulphur trioxide.

3-Because it decomposes into sodium nitrite and oxygen gas.

6 What happens if ...?

1- 9:3:3:1 ratio in second generation.

2- Offspring will be able to roll their tongues.

3- The trait depending on that protein won't appear

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Section 20

1 Choose the correct answer:

1. c
2. d
3. a
4. b
5. b

2 Complete the following :

1. calcitonin
2. pea
3. ions
4. faster
5. 20

3 put (✓) or (x) :

1. x
2. x
3. X

4 Write the scientific term :

1- Testosterone

5 Give a reason for the following :

1-Because low temperature slows down bacteria's chemical reactions.

2-Because they increase the rate of reaction.

3-Because it acts as a catalyst to decompose hydrogen peroxide.

6 What happens if ...?

1- Current doubles.

2- It decomposes into water + oxygen.

3- Offspring carry dominant traits only (3:1 in second gen).

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is fun
Discover, explore,
and imagine
with every page.