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TENTH STANDARD SCIENCE

SLOW LEARNERS STUDY MATERIAL

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1. Laws of Motion

1. **Define Inertia. Give its Classification**

The inherent property of a body to resist any change in its state of rest or the uniform motion, unless it is influenced upon by an external unbalanced force is known as inertia.

1. Inertia of rest
2. Inertia of motion
3. Inertia of direction

2. **Classify the types of force based on their application**

(i) Like parallel force
(ii) Unlike parallel force

3. **Differentiate mass and weight**

	Mass	Weight
1.	The quantity of matter contained in the body	The gravitational force exerted on the body
2.	Unit is kilogram	Unit is Newton

4. **Define Moment of couple**

Moment of couple = Force X Perpendicular distance

5. **State the principle of moments**

The algebraic sum of the moments in the clockwise direction is equal to the algebraic sum of the moments in the anticlockwise direction.

6. **State Newton's Second Law**

The force acting on a body is directly proportional to the rate of change of linear momentum of the body.

7. **While catching a cricket ball the fielder lowers his hands backwards. why?**

Longer interval of time, resulting in lesser impulse on his hand.

8. **How does an astronaut float in a space shuttle?**

Since Space Station and astronaut have equal acceleration they are under free fall condition and in the state of weightlessness and seem floating.

9. **State the Newton's law of motion**

Ist Law :

Everybody continues to be in its state of rest or in the uniform motion along a straight line unless it is acted upon by some external force.

IInd Law :

The force acting on a body is directly proportional to the rate of change of linear momentum.

IIIrd Law :

For every action there is an equal and opposite reaction.

10. **Describe the rocket propulsion:**

1. Propulsion of rockets are based on the law of conservation of linear momentum and Newton's third law of motion.
2. Rockets are filled with a fuel.
3. The mass of the rocket decreases with altitude.
4. According to the law of conservation of linear momentum decrease in mass, increases the velocity.

2. OPTICS

1. **What if refractive Index?**

The ratio of speed of light in Vacuum to the speed of light in a medium is refractive Index of the medium.

2. **State Snell law**

The ratio of the sine of the angle of incidence to sine of the angle of the refraction is equal to the ratio of refractive indices of the two media.

3. **Define dispersion of light**

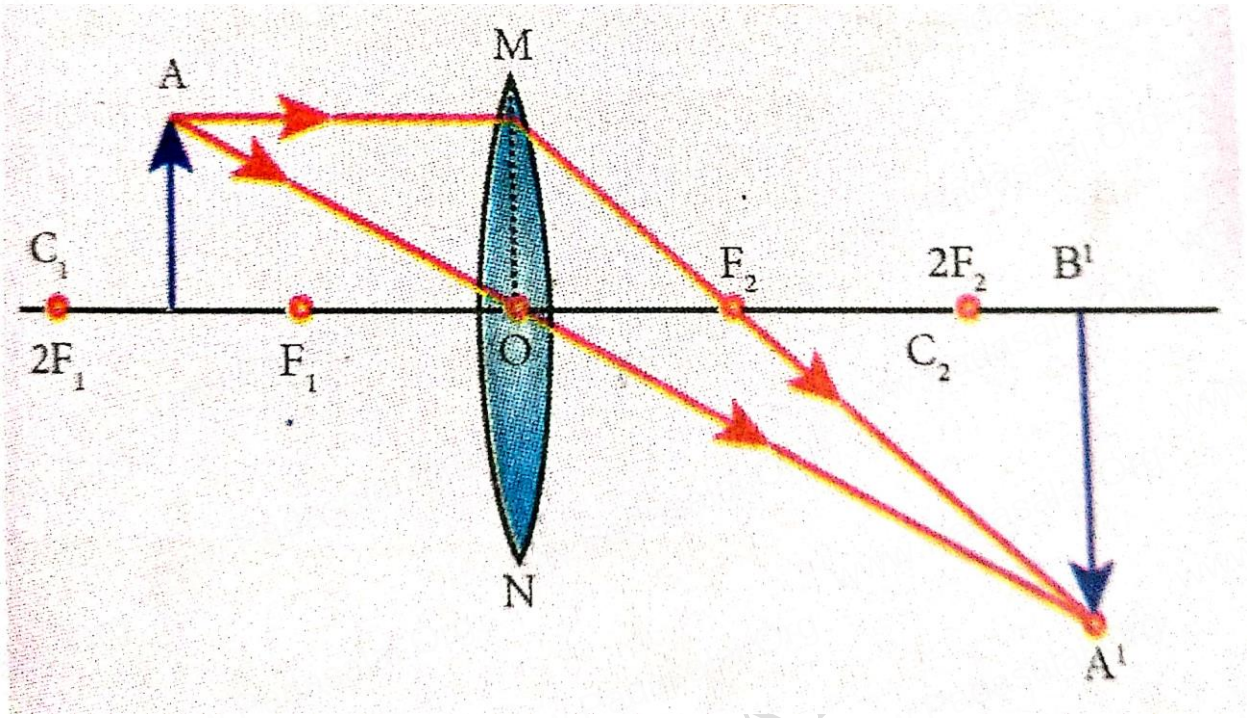
When a beam of white light is refracted through any transparent media, it splits into its component color. This is called dispersion of light.

4. **State Rayleigh's law of scattering**

The amount of scattering of light is inversely proportional to the fourth power of its wave length.

$S = 1/\lambda^4$

5. **Draw a ray diagram to show the image formed by a convex lens when the object is placed between F and 2F**



6. **Differentiate convex lens and concave lens**

	Convex lens	Concave lens
1.	Converging lens	Diverging lens
2.	Produces real images	Produces Virtual images

7. **What are the causes of "Myopia"?**

Lengthening of eye ball and shortening of focal length increases the distance between eye lens and retina.

8. **Why does the sky appears in blue colour?**

The blue colour with shorter focal length scatters to a greater extent, causes the sky to appear in blue colour.

9. **Why are traffic signals red in colour?**

As the red light has highest wavelength, it scatters least and travels a longer distance.

10. **List any five properties of light?**
    1. Light is a form of energy
    2. Travels along a straight line
    3. Does not need any medium
    4. Different colored light has different wave length
    5. Lowest wave length – violet
       Highest wave length – red

11. **Differentiate Myopia and Hypermeteropia**

	Myopia	Hypermeteropia
1.	Lengthening of eye ball	Shortening of eye ball
2.	Distance objects cannot be seen	Nearby objects cannot be seen
3.	The focal length of the eye lens is reduced	The focal length of the eye lens is increased
4.	Can be corrected using concave lens	Can be corrected using convex lens
5.	It is short sightedness	It is long sightedness

3. Thermal Physics

1. **Define one calorie**

One calorie is defined as the amount of heat energy required to rise the temperature of 1 gram of water through 1^oC

2. **State Boyle's law**

At constant temperature the volume of a fixed mass of gas is inversely proportional to its pressure. $P\alpha\frac{1}{V}$

3. **State charle's law (law of volume)**

At constant pressure the volume of a gas is directly proportional to the temperature of the gas. $V\alpha T$

4. **State Avogadro's law**:

At constant pressure and temperature, the volume of a gas is directly proportional to number of atoms or molecules present in it.

5. **Derive the ideal gas equation**

According to Boyle's law PV=Constant

According to Charle's law V/T = Constant

According to Avogadro's law $\frac{V}{n}$ = Constant

$n = \mu N_A$

$PV / \mu N_A T$ = Constant

$PV = RT$

Here $\mu N_A K_B = R$ is the universal gas constant $R = 8.31\ Jmol^{-1}K^{-1}$

4. Electricity

1. **Define the unit of current**

The unit of current is ampere (A) One Coulomb of charge flows through the conductor in one second.

2. **What happens to the resistance as the conductor is made thicker?**

Resistance decreases

Resistance is inversely proportional to area of cross section.

3. **Why is tungsten metal used in bulbs; but not in fuse wires?**

* Tungsten has high melting point
* If it is used in fuse wire, it will not melt when large current passes through it.
* Appliances will get damaged.

4. **Name any two devices, which are working on the heating effect of the electric current.**

1. Electric heater
2. Electric Iron box

5. **State Ohm's law**

At constant temperature, the steady current flowing through a conductor is directly proportional to the potential difference between two ends of the conductor.

$V = IR$

6. **Distinguish between the resistivity and conductivity of a conductor**

	Resistivity	Conductivity
1.	$\rho = RA / L$	$\sigma = 1 / \rho$
2.	Ohm meter	$Ohm^{-1}\ meter^{-1}$

7. **What connection is used in domestic appliances and why?**

Parallel Connection.

8. **(a) What is meant by electric current**

The rate of flow of charges in a conductor

(b) Name and define its units?

The unit of current is ampere (A) One Coulomb of charge flows through the conductor in one second.

(c) **Which instrument is used to measure the electric current? How should it be connected in a circuit?**

Ammeter, Series connection

9. A)**State Joule's law of heating**

The heat produced in a resistor is directly proportional to

(i) Square of the current
(ii) Resistance
(iii) Time

B) An alloy of nickel and chromium is used as heating element. Why?

High resistivity, High melting point, not easily oxidized.

10. A) **What are the advantages of LED TV over the normal TV?**

Bright quality picture
Thin Size
More life span

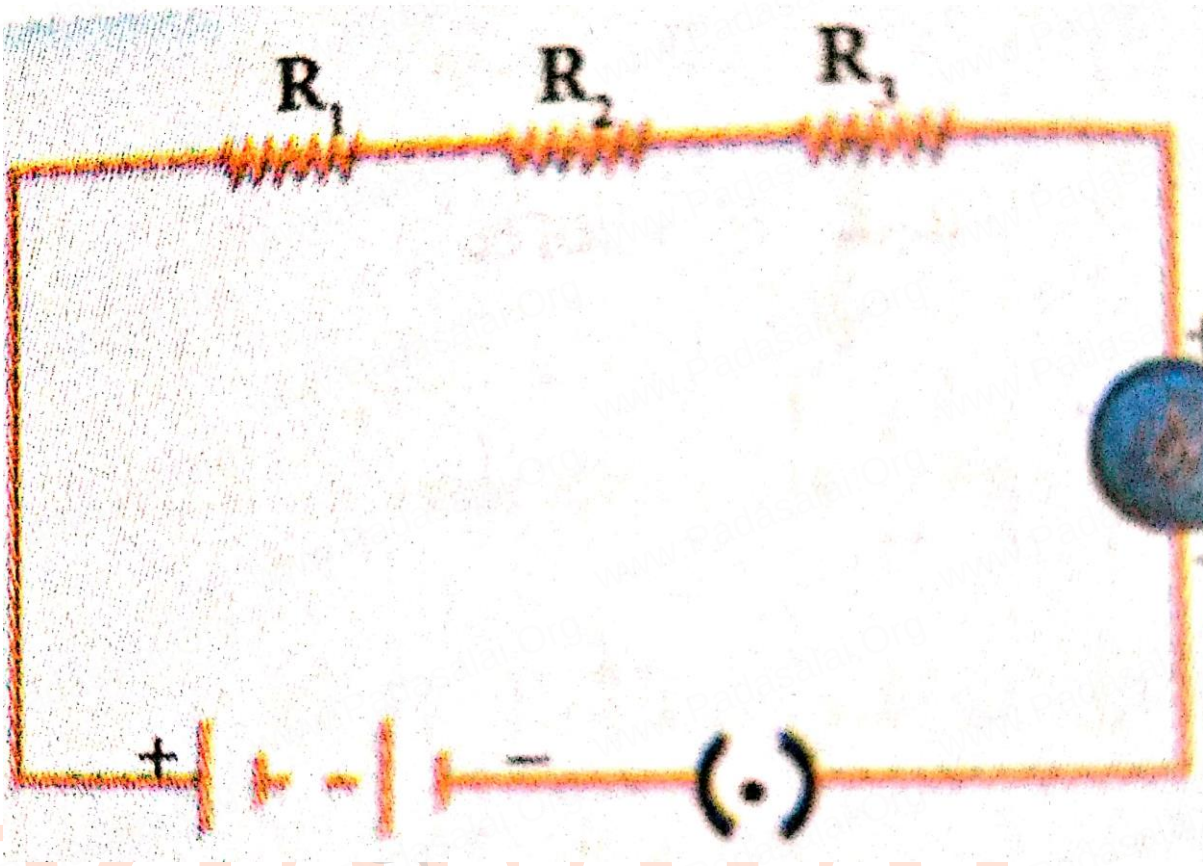
b) List the merits of LED Bulbs

Low Power
Not harmful
Low cost

11. With the help of circuit diagram, drive the formula for the resultant resistance of three resistances connected (a) in Series (b) in Parallel

(a) Series connection :

According to Ohm's law



$V_1 = IR_1$

$V_2 = IR_2$

$V_3 = IR_3$

$V = V_1 + V_2 + V_3$

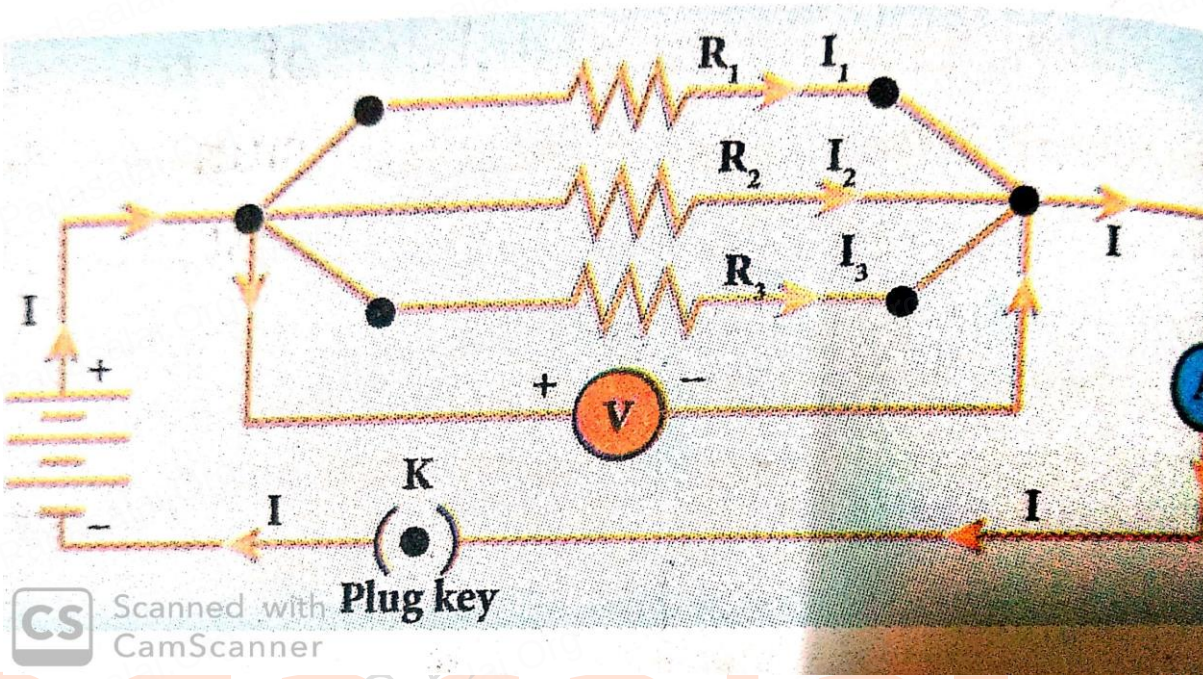
$V = IR_1 + IR_2 + IR_3$

$V = IR_S$

$R_S = R_1 + R_2 + R_3$

(b) Parallel connection :

According to Ohm's law



$I_1 = V / R_1$

$I_2 = V / R_2$

$I_3 = V / R_3$

$I = I_1 + I_2 + I_3$

$I = V / R_1 + V / R_2 + V / R_3$

$I = V / R_P$

$V / R_P = V / R_1 + V / R_2 + V / R_3$

$1 / R_P = 1 / R_1 + 1 / R_2 + 1 / R_3$

5. Acoustics

1. **What is a longitudinal wave?**

The wave in which the particles of a medium vibrate along the direction of propagation.

2. **What is the audible range of frequency?**

Between 20Hz to 20,000Hz

3. **What is the minimum distance needed for an echo?**

17.2m

4. **Name three animals which can hear ultrasonic vibration**

Mosquitoes, Dogs and Bats

5. **Why does sound travel faster on a rainy day than on a dry day?**

During rainy day the velocity of the sound increases as humidity increases. Hence we can hear the sound clearly.

6. **Explain why, the ceiling of concert halls are curved.**

Due to the multiple reflection of sound waves from the curved surface, its intensity changes. Hence the audience can hear the sound clearly.

7. **Mention two cases in which there is no Doppler effect in sound**

When the source and the listener both are at rest and move in a constant distance.

8. **What are the factors that affect the speed of sound in gases?**

1. When the density increases the velocity decreases.
2. When the temperature increases the velocity increases.
3. When the humidity increases velocity of the sound increases.

9. (a) **What do you understand by the term ultrasonic vibration.**

Ultrasonic Vibrations are sound vibrations with frequency greater than 20,000 Hz

(b) **State the uses of ultrasonic vibration:**

1. Ultrasonic communications: - Animals like bat communicate with each other.
2. Ultrasonic cleaning: Used to remove impurities from metals.
3. Ultrasonography: To create the images of internal organs.

10. **(a) what is an echo?**

The sound reproduced due to the reflection of the original sound.

(b) State two conditions necessary for hearing an echo.

1. The minimum time gap between the original sound and an echo must be 0.1S
2. The minimum distance required to hear an echo is 17.2m

(c) What are the medical application of echo?

Echo is used in ultrasonography.

(d) How can you calculate the speed of sound using echo?

$$\text{Speed of sound} = \frac{\text{Distance travelled}}{\text{Time taken}}$$

6. Nuclear Physics

1. **Who discovered natural radioactivity?**

Henri Becquerel

2. **Which radioactive material is present in the ore of pitchblende?**

Uranium

3. Write any two element which are used for induction radioactive?

Boron and Aluminium.

4. Write the name of the electromagnetic radiation which is emitted during the natural radioactive. Υ rays.

5. If A is a radioactive element which emits an α – particles and produces $_{104}Rf^{259}$ .Write the atomic number and the mass number of the element A.

Atomic number – 106

Mass number -263

6. What is the average energy released from a single fission process?

3.2×10^{-11}J.

7. Which hazardous radiation is cause for the genetic disease?

Gamma radiation.

8. What is the amount of radiation that may cause death of a person when exposed to it? 600 R

9. When and where was the first nuclear reactor built?

In 1942, Chicago, USA

10. Give the SI unit of radioactive?

Becquerel (Bq)

11. Which material protects us from radiation?

Lead.

12. **Write the three features of natural and artificial radioactivity**

	Natural Radio Activity	Artificial Radio Activity
1.	Cannot be controlled	Can be controlled
2.	Spontaneous Process	Induced Process
3.	Atomic number more than 83	Atomic number less than 83

13. **Define one roentgen:**

The quantity of radioactive substance which produces a charge of 2.58×10^{-4} coulomb in 1 kg of air at standard pressure temperature and humidity.

14. **State Soddy and Fajan's displacement law**

α decay → In daughter nuclei 4 units of mass number and 2 units of atomic number will be decreased.

β decay → in daughter nuclei same mass number and atomic number will be increased by 1 unit.

15. **Give the Functions of control rods in a nuclear reactor.**

To control the neutrons by absorbing.

16. **In Japan some of the newborn children are having congenital diseases. Why?**

Due to the high exposure of radiation caused by Atom bomb.

17. **Mr.Ramu is working as X-ray technician in a hospital. But he does not wear the lead aprons. What suggestions will you give to the Ramu?**

I will advise him to wear lead apron.

18. **What is stellar energy?**

Fusion reaction that takes place in the core of the stars like sun, emit a large amount of energy in the form of light and heat.

19. **Give any uses of radio isotopes in the field of agriculture.**

1. To increase the production of crops using radio phosphorous
2. To kill the insects and parasites

20. **Compare the properties of Alpha, Beta, and Gamma ray**

Alpha rays	Beta rays	Gamma rays
Helium nucleus	Electrons	Photons
Positively charged	Negatively charged	Neutral charged
Ionizing power high	Ionizing power low	Ionizing power very low

21. **What is nuclear reactor? Explain its essential parts with their functions**

Device in which the nuclear fusion reaction takes place in a self-sustained and controlled manner to produce electricity.

Essential Parts:

1. Fuel
2. Moderator
3. Control rod
4. Coolant
5. Protection wall

7. Atoms and Molecules

1. **Define Relative Atomic Mass:**

Relative atomic mass of an element is the ratio between the average mass of its isotopes to 1/12th part of the mass of a carbon 12 atom

2. **Write the different types of isotopes of oxygen and its percentage of abundance?**

Isotopes	% of abundance
$_8O^{16}$	99.757
$_8O^{17}$	0.038
$_8O^{18}$	0.205

3. **Define Atomicity.**

The number of atoms present in the molecule is called atomicity

4. **Give any 2 examples for hetero diatomic molecules.**

a. Carbon monoxide (CO)

b. Hydrogen Chloride (HCl)

5. **What is molar volume of gas?**

One mole of any gas occupies22.4 liter. This volume is called as molar volume.

6. **Give the salient features of modern atomic theory.**

1. An atom is no longer indivisible.
2. Atom is a smallest particle
3. The mass of an atom can be converted into energy
4. Atoms may not always combine in a simple form.

7. **Drive the relationship between relative molecular mass and vapour density.**

Relative molecular mass:

It is the relationship between the mass of one molecule of the gas to the one atom of hydrogen.

Vapour density:

In STP, the ratio of the mass of a certain volume of a gas to the mass of an equal volume of hydrogen.

$$\text{Vapour density} = \frac{\text{Mass of certain volume of a gas}}{\text{The mass of an equal volume of hydrogen}}$$

Relative molecular mass = 2 X Vapour Density

8. Periodic classification of Elements

1. **A is a silvery white metal, A combines with O_2 to form B at 800°C, the alloy of A is used in making the aircraft find A and B.**

A - Aluminium

B - Aluminium Oxide

2. **What is rust? Give the equations for formation of rust?**

When iron is exposed to moist air, it forms a layer of brown hydrated ferric oxide on its surface. It is called rust.

3. **State two conditions necessary for rusting of iron.**

a) Moisture b) Water c) Oxygen

9. Solutions

1. **Define the term solution.**

A solution is a homogeneous mixture of two or more substances.

2. **What is meant by binary solution?**

A solution consisting of two components, a solute and a solvent is called binary solution.

3. **Give an example each**

Solute and Solvent	**Example**
Gas in liquid	Soda water
Solid in liquid	Sodium Chloride in water
Solid in solid	Alloys
Gas in gas	Helium-Oxygen gas

4. **What is aqueous and non aqueous solution? Give an example**

The Solution in which water acts as a solvent is called an aqueous solution.

Ex: Common salt in water

The Solution in which any liquid, other than water acts as a solvent is called

non-aqueous solution.

Ex: Sulpur dissolved in CS_2

5. **The aquatic animals live more in cold region why?**

The solubility of oxygen in water is more at low temperatures.

6. **Clarify the following substances into deliquescent, hygroscopic**

Con Sulphuric Acid, Copper sulphate, Penta Hydrate, Silica Gel, Calcium Chloride and Gypsum Salt.

Hygroscopic	Deliquescent
1. Con Sulphuric Acid	1. Copper Sulphate Penta Hydrate
2. Silica Gel	2. Calcium Chloride
	3. Gypsum Salt

7. **Write notes on a) saturated Solution b) Unsaturated Solution**

Saturated Solution:

A solution in which no more solute can be dissolved in a definite amount of the solvent at a given temperature is called saturated solution.

Ex: 36 g of sodium chloride in 100g of water at 25^0C

Unsaturated Solution:

A solution which contains less solute than that of saturated solution is called unsaturated solution.

Ex: 10g of sodium chloride in 100g of water

8. **Write notes on various factors affecting solubility**

a) Nature of the solute and solvent
b) Effect of temperature
c) Effect of pressure

9. **In what way hygroscopic substances differ from deliquescent substances**

Hygroscopic Substances	Deliquescent Substances
1. They absorb moisture and Do not dissolve	1. They absorb moisture and dissolve

2. They do not change its Physical state	2. They change their physical state
3. They may be amorphous solids	3. They are crystalline solids

10. Chemical Reaction

1. **When an aqueous solution of potassium chloride is added to an aqueous solution of silver nitrate, a white precipitate is formed. Give the chemical equation of this reaction.**

$Kcl_{(aq)} + AgNO_3 \rightarrow Agcl_{(s)} + KNO_{3(aq)}$

2. **Why does the reaction rate of a reaction increase on raising the temperature?**

Most of the reactions go faster at higher temperature by breaking more bonds of the reactants.

3. **Differentiate reversible and irreversible reactions**

Reversible Reaction	Irreversible Reaction
1. If can be reversed	1. It cannot be reversed
2. It attain equilibrium	2. It does not attain equilibrium
3. It is slow	3. It is fast

4. **What are called Thermolysis reaction?**

In thermal decomposition reactions, the reactant is decomposed by applying heat.

The reaction occurs by absorbing heat. It is called thermolysis reaction.

5. **Explain the types of double displacement reactions with example**

Double displacement reaction:

When two compounds react if their irons or interchanged, then the reaction is called double displacement reaction. It classified into two types.

(i) Precipitation Reactions

(ii) Neutralization Reactions.

6. **Explain the factors influencing the rate of reaction**
    1. Nature of reactants
    2. Concentration of reactants
    3. Temperature
    4. Catalyst
    5. Pressure
    6. Surface area of the reactants.

7. **How does pH play on important role in everyday life?**
    1. Our body works within the pH range of 7.0 to 7.8
    2. The ideal pH of blood is 7.4
    3. The pH of saliva ranges between 6.5 to 7.5
    4. In agriculture, the pH of soil is very important.

8. **What is chemical equilibrium? What are its characteristics?**

It is state of a reversible chemical reaction in which no change in the amount of reactants and products takes place at equilibrium.

Rate of forward reaction = Rate of backward reaction

11. Carbon and its compounds

1. **How is ethanoic acid prepared from ethanol? Give the chemical equation**

Ethanoic acid is prepared by the oxidation of ethanol in the presence of alkaline potassium permanganate or acidified potassium dichromate.

$$CH_3CH_2OH \xrightarrow[2(O)]{KMnO_4/OH} CH_3COOH + H_2O$$

Ethanol Ethanoic acid

2. **Differentiate soaps and detergents**

Soaps	Detergents
1. Soaps are does not used With hard water	1. Detergents are used with hard water
2. Biodegradable	2. Non-biodegradable

3. **What is called homologous series? Give any three of its characteristics.**

Homologous series is a group or a class of organic compounds having same general formula and similar chemical properties.

Characteristics:

1. They are involved same kind of chemical reactions.
2. They are prepared by same method.

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

1. What is conjoint vascular bundle?

Xylem and phloem lie on the same radius in one bundle are called conjoint vascular bundle.

2. Where does the carbon that is used in photosynthesis come from?

Atmospheric Carbon-di-oxide

3. What is the common step in aerobic and anaerobic pathway?

Glycolysis

4. Name the phenomenon by which carbohydrates are oxidized to release ethyl alcohol.

Anaerobic respiration

5. Give an account on vascular bundle of dicot stem.

Conjoint, collateral, open and endarch xylem. They are arranged in the form of ring around the pith.

6. Write a short note on mesophyll.

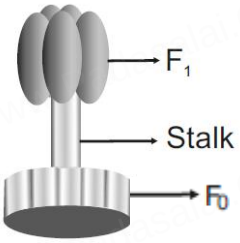
i) The tissue present between the upper and lower epidermis is called mesophyll.
ii) It is differentiated into Pallisade parenchyma and Spongy parenchyma.

7. Name the three basic tissues system in flowering plants.

i) Dermal Tissue System
ii) Ground Tissue System

iii) Vascular Tissue System

8. Draw and label the structure of oxysomes.



9. What is photosynthesis and where in a cell does it occur?

Green plants to synthesize their own food by using chlorophyll and sunlight is called Photosynthesis. It takes place in the chloroplast of the cell.

10. Write the reaction for photosynthesis?

$$\text{Carbon dioxide} + \text{Water} \xrightarrow[\text{chlorophyll}]{\text{Light}} \text{Glucose} + \text{Water} + \text{Oxygen}$$

11. Differentiate the following

a) Monocot root and Dicot root

Tissues	Monocot root	Dicot root
Number of Xylem	Polyarch	Tetrarch
Secondary growth	Absent	Present
Pith	Present	Absent

b) Aerobic and Anaerobic respiration

Aerobic respiration	Anaerobic respiration
Takes place with the help of Oxygen	Takes place without Oxygen
Carbon-di-oxide, water and ATP are formed	Carbon-di-oxide, ethanol and ATP are formed

12. How does the light dependent reaction differ from the light independent reaction? What are the end product and reactants in each? Where does each reaction occur within the chloroplast?

i) Light dependent Reaction and Light Independent Reaction:

Light dependent Reaction	Light Independent Reaction
It requires sunlight	It does not require sunlight
Thylakoid of the chloroplast	Stroma of the chloroplast

ii) Reactants and End products:

	Reactants	End products

Light dependent	Photosynthetic pigment, light and water	ATP, O_2
Light Independent	CO_2, ATP	Glucose

iii) Place of occurrence:

Light dependent : Thylakoid of the chloroplast

Light Independent : Stroma of the chloroplast

13 STRUCTURAL ORGANISATION

1. Give the common name of the *Hirudinaria granulosa*.

Indian Cattle Leech

2. How does leech respire?

Through the skin

3. Write the dental formula of rabbit.

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4. How many pairs of testes are present in leech?

11 pairs

5. How is diastema formed in rabbit?

The gap inbetween the incisors and premolar is called diastema.

6. What organs are attached to the two bronchi?

Lungs

7. Which organ acts as suction pump in leech?

Muscular pharynx

8. What does CNS stand for?

CNS – Central Nervous System

9. Why is the teeth of rabbit called heterodont?

In rabbit the teeth are of different types called heterodont.

10. Why are the rings of cartilages found in trachea of rabbit?

It helps in the free passage of air.

11. List out the parasitic adaptations in leech.

i) Blood is sucked by pharynx

ii) Blood is stored in the crop

iii) Hirudin which does not allow the blood to coagulate.

12. How does locomotion take place in leech?

i) Looping or crawling movement
ii) Swimming movement

14 TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

1. Name two layered protective covering of human heart.

Pericardium

2. What is the shape of RBC in human blood?

Biconcave and disc shaped

3. Why is the colour of the blood red ?

The RBCs impart red colour to the blood due to presence of respiratory pigment **haemoglobin.**

4. Which kind of cells are found in the lymph?

White Blood Corpuscles (RBC)

5. Name the heart valve associated with the major arteries leaving the ventricles.

Semilunar valves

6. Mention the artery which supplies blood to the heart muscle.

Coronary artery

7. What is cohesion?

The force of attraction between molecules of water is called cohesion.

8. Trace the pathway followed by water molecules from the time it enters a plant root to the time it escapes into the atmosphere from a leaf.

Root pressure → Capillary action → Adhesion → Cohesion → Transpiration pull → Transpiration

9. What would happen to the leaves of a plant that transpires more water than its absorption in the roots?

i) This leads to wilting or drying of leaves.
ii) It may also lead to death of a plant.

10. Describe the structure and working of the human heart.

i) The human heart is made up of cardiac muscles.
ii) It is enclosed by the pericardium.

iii) Four chambered.
iv) Two upper chambers are called auricles and two lower chambers are called ventricles.
v) It is a pumping organ that pumps out blood into the blood vessels.

11. Why is the circulation in man referred to as double circulation?

In man the blood circulates twice through the heart in one complete cycle is called double circulation.

12. What are heart sounds? How are they produced?

i) The rhythmic closure and opening of the valves of the heart causes heart sounds.
ii) Lubb is produced by the closure of the tricuspid and bicuspid valves.
iii) Dupp is produced by the closure of the semilunar valves.

13. What is the importance of valves in the heart?

The valves are regulate the flow of blood.

14. Who discovered Rh factor? Why was it named so?

i) Rh factor was discovered by Landsteiner.
ii) The Rh name was derived from the name of the Rhesus monkey.

15. How are arteries and veins structurally different from one another?

Arteries	Veins
Distributing vessel	Collecting vessel
Deep location	Superficial in location

16. Differentiate between systemic circulation and pulmonary circulation.

Systemic circulation	Pulmonary circulation
It starts from left ventricle	It starts from the right ventricle
It carries oxygenated blood from the left ventricle to various organs	It carries oxygenated blood from lungs to heart
It carries deoxygenated blood from various organs to heart	It carries deoxygenated blood from heart to lungs

17. What is transpiration? Give the importance of transpiration.

i) Transpiration is the evaporation of water in plants through stomata in the leaves.
ii) Supplies water for photosynthesis and cools the surface of the leaves.

18. Enumerate the functions of blood.

i) Transport of respiratory gases.
ii) Transport of hormones.
iii) It maintains proper water balance in the body.

15 NERVOUS SYSTEM

1. Define stimulus.

Stimulus refers to the changes in the environmental condition that are detected by receptors present in the body.

2. Name the parts of the hind brain.

i) Cerebellum
ii) Pons
iii) Medulla oblongata

3. What are the structures involved in the protection of brain?

i) Duramater
ii) Arachnoid membrane
iii) Piamater

4. Which acts as a link between the nervous system and endocrine system?

Hypothalamus

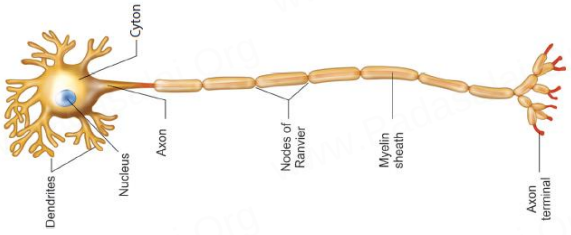
5. Define reflex arc.

The pathway taken by the nerve impulse to accomplish reflex action is called reflex arc.

6. Illustrate the structure and functions of brain.

i) Brain is covered by three connective tissue membrane or meninges.
ii) It is formed of three major parts.
iii) Forebrain – Cerebrum, Thalamus and Hypothalamus (Thinking, sensory and hunger)
iv) Mid brain – Corpora quadrigemina (Auditory reflexes)
v) Hindbrain – Cerebellum, Pons and Medulla oblongata (Body balance, Respiration and Cardiovascular centers)

7. With a neat labelled diagram explain the structure of a neuron.



i) A neuron is the structural and functional unit of the nervous system.

ii) A neuron consists of three basic parts,

1) Cyton or Cell body

2) Dendrites

3) Axon

8. Classify neurons based on its structure.

i) Unipolar neurons – one nerve process arises from the cyton
ii) Bipolar neurons – two nerve processes arise from the cyton
iii) Multipolar neurons – many nerve processes arise from the cyton

16. PLANT AND ANIMAL HORMONES

1. Which hormone promotes the production of male flowers in Cucurbits?

Gibberellins

2. Write the name of a synthetic auxin.

2, 4D

3. Which hormone induces parthenocarpy in tomatoes?

Gibberellins

4. What is the hormone responsible for the secretion of milk in female after child birth?

Prolactin

5. Name the hormones which regulates water and mineral metabolism in man.

Mineralocorticoids – Aldosterone

6. Which hormone is secreted during emergency situation in man?

Epinephrine, Norepinephrine.

7. Which gland secretes digestive enzymes and hormones?

Pancreas

8. Name the endocrine glands associated with kidneys.

Adrenal gland

9. What are synthetic auxins? Give examples.

Artificially synthesized auxins that have properties like auxins are called as synthetic auxins. Eg. 2, 4D.

10. What will you do to prevent leaf fall and fruit drop in plants? Support your answer with reason.

Treating plants with auxin will prevent leaf fall and fruit drop.

11. What are chemical messengers?

Hormones – Eg. Growth hormone.

12. Write the differences between endocrine and exocrine gland.

Endocrine	Exocrine
ductless glands	specific ducts present
secrete hormones	secretes saliva, sweat, etc.

13. What is the role of parathormone?

It regulates calcium and phosphorus metabolism.

14. Why are thyroid hormones refered as personality hormone?

It is essential for normal physical, mental and personality development.

15. Which hormone requires iodine for its formation? What will happen if intake of iodine in our diet is low?

i) Thyroid hormones

ii) Goitre

16. Name the gaseous plant hormone. Describe its three different actions in plants.

i) Ethylene

ii) It promotes the ripening of fruits and hastens senescence of leaves and fruits.

17. Write the physiological effects of gibberellins.

i) Gibberellins on plants stimulate elongation of internode

ii) It breaks dormancy of potato tubers.

iii) Inducing the formation of seedless fruit.

18. Where are estrogens produced? What is the role of estrogens in the human body?

Estrogen produced in Graafian follicles of the ovary

Functions:

i) Estrogens bring about the changes that occur during puberty.

ii) It promotes the development of secondary sexual characters.

17 REPRODUCTION IN PLANTS AND ANIMALS

1. If one pollen grain produces two male gametes, how many pollen grains are needed to fertilize 10 ovules?

10 pollen grains

2. In which part of the flower germination of pollen grains takes place?

Stigma

3. Name two organisms which reproduces through budding.

Yeast, Hydra

4. Mention the function of endosperm.

Food to the developing embryo.

5. Name the hormone responsible for the vigorous contractions of the uterine muscles.

Oxytocin

6. What is the enzyme present in acrosome of sperm?

Hyaluronidase

7. When is World Menstrual Hygiene Day observed?

May 28th

8. What is the need for contraception ?

It is a birth control measure

9. Name the part of the human female reproductive system where the following occurs.

Fertilization: - Fallopian tube

Implantation: - Uterus

10. What will happen if you cut planaria into small fragments?

New organism formed by the process of regeneration.

11. Define triple fusion.

One sperm fuses with the egg and forms a diploid zygote. The other sperm fuses with secondary nucleus to form triploid endosperm. This is called triple fusion.

12. Write the characteristics of insect pollinated flowers.

Flower colour, smell and nectar.

13. Name the secondary sex organs in male

Vas deferens, seminal vesicle and penis

14. What is colostrum? How is milk production hormonally regulated ?

i) The milk produced from the breast during the first 2 to 3 days after child birth is called colostrum.

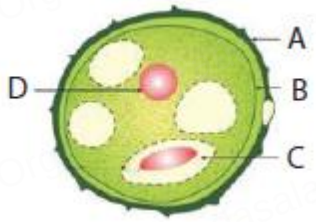
ii) It is regulated by oxytocin.

15. How can menstrual hygiene be maintained during menstrual days?

i) Use of warm water to clean genitals.

ii) Wearing loose clothing.

16. Identify the parts A, B, C and D



Ans: **A-** Exine
B- Intine
C- Generative cell
D- Vegetative nucleus

17. Write the events involved in the sexual reproduction of a flowering plant.

i) Pollination
ii) Fertilization.

Types of pollination:

a) Self pollination
b) Cross pollination

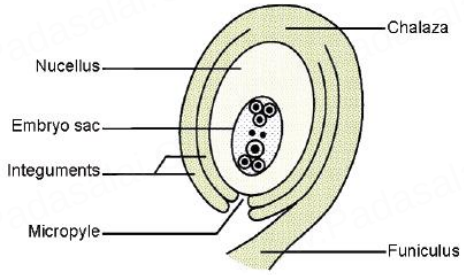
18. What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

The cyclic events that take place in a rhythmic fashion during the reproductive period of a woman's life is called menstrual cycle.

Menstrual cycle consists of 4 phases:

i) Destructive Phase
ii) Proliferative phase
iii Ovulatory phase
iv) Secretory phase

19. With a neat labelled diagram describe the parts of a typical angiospermic ovule.



i) The main part of the ovule is the nucellus.
ii) Nucellus enclosed by two integuments
iii) Chalaza is the basal part.

18. HEREDITY

1. What is a cross in which inheritance of two pairs of contrasting characters are studied?

Dihybrid Cross

2. Name the conditions when both the alleles are identical?

Homozygous condition

3. A garden pea plant produces axial white flowers. Another of the same species produced terminal violet flowers. Identify the dominant trait?

i) Axial white flower – Dominant
ii) Terminal violet flower – Recessive

4. What is the name given to the segments of DNA, which are responsible for the inheritance of a particular character?

Genes

5. Name the bond which binds the nucleotides in a DNA.

Hidrogen bond

6. Why did Mendel select pea plant for his experiments?

i) The flowers are bisexual

ii) It is easy to cross – pollinate.

7. What do you understand by the term phenotype and genotype?

Phenotype: External expression of a particular trait

Genotype: Genetic expression of an organism

8. What are allosomes?

Allosomes are chromosomes which are responsible for determining the sex of an individual.

9. Explain the structure of a chromosome.

The chromosomes are thin, long and thread like structures consisting of two identical strands called sister chromatids.

10. Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?

Dihybrid cross: - It is a cross between two pairs of contrasting characters

Phenotype ratio: - 9:3:3:1

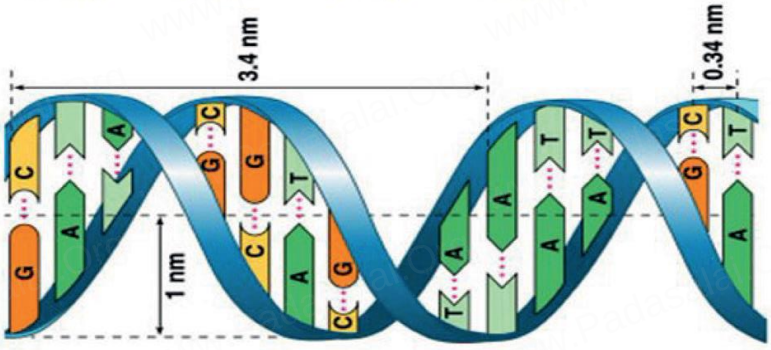
Eg.: - Seed shape and seed colour.

Monohybrid cross:- It is a cross between one pair of contrasting characters.

Phenotype ratio:- 3:1

Eg: - Tall and dwarf plant.

11. How is the structure of DNA organised? What is the biological significance of DNA?



i) DNA molecule consists of two polynucleotide chains.

ii) It is responsible for the transmission of hereditary information from one generation to next generation.

19. ORIGIN AND EVOLUTION OF LIFE

1. A human hand, a front leg of a cat, a front flipper of a whale and a bat's wing look dissimilar and adapted for different functions. What is the name given to these organs?

Homologous organs

2. Which organism is considered to be the fossil bird?

Archaeopteryx

3. What is the study of fossils called?

Paleontology

4. The degenerated wing of a kiwi is an acquired character. Why is it an acquired character?

No, It is an example for organ of disuse.

5. Define Ethnobotany and write its importance.

i) Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of the local culture of people.

ii) It provides traditional uses of plant.

6. How can you determine the age of the fossils?

i) By radioactive elements

ii) By measuring the amount of carbon.

7. How does fossilization occur in plants?

The process of formation of fossil in the rocks is called fossilization.

Types of Fossilization:

i) Petrifaction

ii) Mold and Cast

iii) Preservation

iv) Compression

v) Infiltration or replacement

8. How do you differentiate homologous organs from analogous organs?

Homologous organs	Analogous organs
Similar developmental pattern	Different developmental pattern
Eg.Human hand, and the front leg of a cat.	Eg. Bat and Bird

20. BREEDING AND BIOTECHNOLOGY

1. Give the name of wheat variety having higher dietary fibre and protein.

Triticale (6n)

2. Semi-dwarf varieties were introduced in rice. This was made possible by the presence of dwarfing gene in rice. Name this dwarfing gene.

Defective gibberellins 20 – oxidase gene.

3. Define genetic engineering.

Genetic engineering is the manipulation and transfer of genes from one organism to another organism.

4. Name the types of stem cells.

i) Embryonic stem cells
ii) Adult stem cells

5. What are transgenic organisms?

Plants and Animals expressing a modified gene are called transgenic organisms.

6. Discuss the method of breeding for disease resistance.

i) It is important to develop disease resistant varieties
ii) It increases the yield
iii) It reduces the use of fungicides and bactericides.

7. Name three improved characteristics of wheat that helped India to achieve high productivity.

Protein rich, disease resistant and high yielding semi – dwarf wheat variety.

8. Name two maize hybrids rich in amino acid lysine

i) Protina
ii) Shakti

9. State the applications of DNA fingerprinting technique.

i) It is used for paternity testing
ii) It is used as identifying the culprit in crime investigation.

10. Discuss the importance of biotechnology in the field of medicine.

i) Insulin used in the treatment of diabetes.
ii) Development of vaccines against Hepatitis B and Rabies diseases.

21. HEALTH AND DISEASES

1. What are psychotropic drugs ?

The drugs act on the brain and change the behaviour are called psychotropic drugs.

2. Mention the diseases caused by tobacco smoke.

i) Lungs and oral cancer
ii) Bronchitis
iii) Pulmonary tuberculosis

3. What are the contributing factors for Obesity?

i) Genetic factors
ii) Eating habits
iii) physical inactivity

4. What is adult onset diabetes?

Non – Insulin Dependent Diabetes Mellitus is called adult onset diabetes.

5. What is metastasis?

The cencerous cells migrate to distant parts of the body and affect new tissues are called metastasis.

6. How does insulin deficiency occur?

Insulin deficiency occurs due to the destruction of β – cells in the pancreas.

7. What are the various routes by which transmission of human immuno deficiency virus takes place ?

i) Sexual contact with infected person
ii) By transfusion of infected blood.

8. How is a cancer cell different from a normal cell ?

Cancer cell	Normal cell
Uncontrolled cell division	Controlled cell division
Surrounding tissue destroy	Do not destroy surrounding tissue

9. What precautions can be taken for preventing heart diseases ?

i) Intake of low calories foods
ii) Regular exercise

10. Suggest measures to overcome the problems of an alcoholic.

i) Education and counseling
ii) Help from psychologist and psychiatrists
iii) Reading, music, sports, yoga and meditation.

11. Changes in lifestyle is a risk factor for occurrence of cardiovascular diseases. Can it be modified ? If yes, suggest measures for prevention.

Yes, changes in lifestyle can modify the cardiovascular diseases.

Measures for prevention:-

i) Intake of low calories foods
ii) Regular exercise

22. ENVIRONMENTAL MANAGEMENT

1. What will happen if trees are cut down?

Drought, soil erosion and alteration of climatic conditions

2. What would happen if the habitat of wildanimals is disturbed?

Animals approach human settlements in search of food and water and also attack human life.

3. What are the agents of soil erosion?

i) High velocity of wind
ii) Landslide

4. Why fossil fuels are to be conserved?

i) The formation of these fossil fuels is a very slow process
ii) It takes very long period of time for renewal.

5. Solar energy is a renewable energy. How?

i) It gives out vast amount of light and heat
ii) They can be renewed in short period
iii) They are available in unlimited amount in nature.

6. How are e-wastes generated?

Electrical and electronic devices which are out dated or spoiled or non repairable are called E – wastes.

7. What is the importance of rainwater harvesting?

i) Overcome the ground water levels
ii) Reduces soil erosion

8. What are the advantages of using biogas?

i) Less pollution, safe and convenient to use.
ii) It can reduce the amount of greenhouse gases emitted.

9. What are the environmental effect caused by sewage?

It results in agricultural contamination and origin of disease

10. What are the consequences of deforestation?

i) Floods
ii) Drought
iii) Soil erosion
iv) Alteration of climatic conditions

10. How does rainwater harvesting structures recharge ground water?

Main purpose:- Rainwater percolate under the ground to recharge ground water level.

Methods of rainwater harvesting:- Rainwater falls on the roof of the houses, apartments, and commercial buildings are harvested.

11. How will you prevent soil erosion?

i) Reforestation
ii) Planting trees
iii) Controlling of cattle grazing

12. What are the sources of solid wastes?How are solid wastes managed?

Sources: Municipal wastes, Hospital wastes, Industrial wastes and E-wastes.

Management: i) incineration – burning of medical wastes.
ii) Composting – solid wastes converted into humus.

13. Enumerate the importance of forest.

i) Forest are vital for human life
ii) Protect wildlife
iii) Reduce global warming
iv) Maintaining the ecological balance.

14. What are the consequences of soil erosion?

i) It damages to rods
ii) Agriculture and quality of drinking water also affected

15. Why is the management of forest and wildlife resource considered as a challenging task?

i) Water scarcity
ii) Cutting trees
iii) Increasing population

23. VISUAL COMMUNICATION

1. What is Scratch?

'Scratch' is a software used to create animations, cartoons and games easily.

2. Write a short note on editor and its types?

i) Stage – background scratch window
ii) Sprite – characters
iii) Script – edit programs

3. What is Stage?

Stage is the background appearing when we open the scratch window.

4. What is Sprite?

The characters on the background of a Scratch window are known as Sprite.

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