1.Laws of Motion

I. Choose the correct answer

1) Inertia of a body depends on
   a) weight of the object
   b) acceleration due to gravity of the planet
   c) mass of the object
   d) Both a & b

3) Newton's III law is applicable
   a) for a body is at rest
   b) for a body in motion
   c) both a & b
   d) only for bodies with equal masses

4) Plotting a graph for momentum on the Y-axis and time on X-axis. slope of momentum-time graph gives
   a) Impulsive force b) Acceleration
   c) Force d) Rate of force

7) One kilogram force equals to
   a) 9.8 dyne b) 9.8×10^4 N
   c) 98×10^4 dyne d) 980 dyne

8) The mass of a body is measured on planet Earth as M kg. When it is taken to a planet of radius half that of the Earth then its value will be____kg
   a) 4 M b) 2M c) M/4 d) M

9) If the Earth shrinks to 50% of its real radius its mass remaining the same, the weight of a body on the Earth will
   a) decrease by 50% b) increase by 50%
   c) decrease by 25% d) increase by 300%

10) To project the rockets which of the following principle(s) is /(are) required?
   a) Newton's third law of motion
   b) Newton's law of gravitation
   c) law of conservation of linear momentum
   d) both a and c

II. Fill in the blanks

1. To produce a displacement _____ is required
2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by _____
5. A man of mass 100 kg has a weight of _____ at the surface of the Earth

III. State whether the following statements are true or false. Correct the statement if it is false

1. The linear momentum of a system of particles is always conserved.
3. Weight of a body is greater at the equator and less at the polar region.

IV. Match the following

Column I		Column II
a. Newton's I law	-	propulsion of a rocket
b. Newton's II law	-	Stable equilibrium of a body
c. Newton's III law	-	Law of force
d. Law of conservation of Linear momentum	-	Flying nature of bird

VI. Answer briefly.

1. Define inertia. Give its classification.
2. Classify the types of force based on their application.
3. If a 5 N and a 15 N forces are acting opposite to one another. Find the resultant force and the direction of action of the resultant force
4. Differentiate mass and weight.
7. State Newton's second law.

VII. Solve the given problems

1. Two bodies have a mass ratio of 3:4 The force applied on the bigger mass produces an acceleration of 12 ms^{-2}.What could be the acceleration of the other body, if the same force acts on it.
2. A ball of mass 1 kg moving with a speed of 10 ms^{-1} rebounds after a perfect elastic collision with the floor. Calculate the change in linear momentum of the ball.
4. The ratio of masses of two planets is 2:3 and the ratio of their radii is 4:7 Find the ratio of their accelerations due to gravity.

VIII. Answer in detail.

1. What are the types of inertia? Give an example for each type.
2. State Newton's laws of motion?
3. Deduce the equation of a force using Newton's second law of motion.

5. Describe rocket propulsion.
6. State the universal law of gravitation and derive its mathematical expression

IX. HOT Questions

1. Two blocks of masses 8 kg and 2 kg respectively lie on a smooth horizontal surface in contact with one other. They are pushed by a horizontally applied force of 15 N. Calculate the force exerted on the 2 kg mass.
2. A heavy truck and bike are moving with the same kinetic energy. If the mass of the truck is four times that of the bike, then calculate the ratio of their momenta. (Ratio of momenta = 2:1
3. "Wearing helmet and fastening the seat belt is highly recommended for safe journey" Justify your answer using Newton's laws of motion.

2.Optics

I. Choose the correct answer

1. The refractive index of four substances A, B, C and D are 1.31, 1.43, 1.33, 2.4 respectively. The speed of light is maximum in

   a) A b) B c) C d) D

2. Where should an object be placed so that a real and inverted image of same size is obtained by a convex lens

   a) f b) 2f
   c) infinity d) between f and 2f

3. A small bulb is placed at the principal focus of a convex lens. When the bulb is switched on, the lens will produce

   a) a convergent beam of light
   b) a divergent beam of light
   c) a parallel beam of light
   d) a coloured beam of light

5. A convex lens forms a real, diminished point sized image at focus. Then the position of the object is at

   a) focus b) infinity
   c) at 2f d) between f and 2f

7. In a myopic eye, the image of the object is formed

   a) behind the retina b) on the retina
   c) in front of the retina d) on the blind spot

8. The eye defect 'presbyopia' can be corrected by

   a) convex lens b) concave lens
   c) convex mirror d) Bi focal lenses

9. Which of the following lens would you prefer to use while reading small letters found in a dictionary?

   a) A convex lens of focal length 5 cm
   b) A concave lens of focal length 5 cm
   c) A convex lens of focal length 10 cm
   d) A concave lens of focal length 10 cm

10. If V_B, V_G, V_R be the velocity of blue, green and red light respectively in a glass prism, then which of the following statement gives the correct relation?

    a) $V_B = V_G = V_R$ b) $V_B > V_G > V_R$
    c) $V_B < V_G < V_R$ d) $V_B < V_G > V_R$

II. Fill in the blanks:

1. The path of the light is called as _____
2. The refractive index of a transparent medium is always greater than _____
5. Amount of light entering into the eye is controlled by _____

III. True or False. If false correct it.

1. Velocity of light is greater in denser medium than in rarer medium
3. Increase in the converging power of eye lens cause 'hypermetropia'
4. The convex lens always gives small virtual image.

IV. Match the following:

	Column - I		Column - II
1	Retina	a	Path way of light
2	Pupil	b	Far point comes closer
3	Ciliary muscles	c	near point moves away
4	Myopia	d	Screen of the eye
5	Hypermetropia	f	Power of accom-modation

V. Assertion and reasoning type

Mark the correct choice as

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) Assertion is true but reason is false.

d) Assertion is false but reason is true.

1. **Assertion:** If the refractive index of the medium is high (denser medium) the velocity of the light in that medium will be small

   Reason: Refractive index of the medium is inversely proportional to the velocity of the light

2. **Assertion:** Myopia is due to the increase in the converging power of eye lens.

   Reason: Myopia can be corrected with the help of concave lens.

VI. Answer Briefl

1. What is refractive index?
2. State Snell's law.
3. Draw a ray diagram to show the image formed by a convex lens when the object is placed between F and 2F.
4. Define dispersion of light
6. Differentiate convex lens and concave lens.
7. What is power of accommodation of eye?
8. What are the causes of 'Myopia'?

VII. Give the answer in detail

1. List any five properties of light
2. Explain the rules for obtaining images formed by a convex lens with the help of ray diagram.
3. Differentiate the eye defects: Myopia and Hypermetropia

VIII. Numerical Problems:

1. An object is placed at a distance 20cm from a convex lens of focal length 10cm. Find the image distance and nature of the image.
2. An object of height 3cm is placed at 10cm from a concave lens of focal length 15cm. Find the size of the image.

IX. Higher order thinking (HOT) questions:

1. While doing an experiment for the determination of focal length of a convex lens, Raja Suddenly dropped the lens. It got broken into two halves along the axis. If he continues his experiment with the same lens, (a) can he get the image? (b) Is there any change in the focal length?
2. The eyes of the nocturnal birds like owl are having a large cornea and a large pupil. How does it help them?

7.Atoms and Molecules

I. Choose the best answer.

1. Which of the following has the smallest mass?
   a. 6.023×10^{23} atoms of He
   b. 1 atom of He
   c. 2 g of He
   d. 1 mole atoms of He

2. Which of the following is a triatomic molecule?
   a. Glucose b. Helium
   c. Carbon dioxide d. Hydrogen

5. Which of the following represents 1 amu?
   a. Mass of a C – 12 atom
   b. Mass of a hydrogen atom
   c. $1/12^{th}$ of the mass of a C – 12 atom
   d. Mass of O – 16 atom

8. In the nucleus of $_{20}Ca^{40}$, there are
   a. 20 protons and 40 neutrons
   b. 20 protons and 20 neutrons
   c. 20 protons and 40 electrons
   d. 40 protons and 20 electrons

II. Fill in the blanks

1. Atoms of different elements having _____ mass number, but _____ atomic numbers are called isobars.
2. Atoms of different elements having same number of _____ are called isotones.
3. Atoms of one element can be transmuted into atoms of other element by _____
4. The sum of the numbers of protons and neutrons of an atom is called its _____
5. Relative atomic mass is otherwise known as _____
7. If a molecule is made of similar kind of atoms, then it is called _____ atomic molecule.
8. The number of atoms present in a molecule is called its _____

10 Atomicity of phosphorous is _____

IV. True or False: (If false give the correct statement)

1. Two elements sometimes can form more than one compound.
2. Noble gases are Diatomic

3. The gram atomic mass of an element has no unit

4. 1 mole of Gold and Silver contain same number of atoms

5. Molar mass of CO_2 is 42g.

V. Assertion and Reason:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.

ii) A is correct, R is wrong.

iii) A is wrong, R is correct.

iv) A and R are correct, R doesn't explains A.

1. Assertion: The Relative Atomic mass of aluminium is 27

Reason: An atom of aluminium is 27 times heavier than 1/12th of the mass of the C – 12 atom.

VI. Short answer questions

1. Define: Relative atomic mass.

3. Define: Atomicity

4. Give any two examples for heterodiatomic molecules.

VII. Long answer questions

1. Calculate the number of water molecule present in one drop of water which weighs 0.18 g.

2. $N_2 + 3\ H_2 \rightarrow 2\ NH_3$

(The atomic mass of nitrogen is 14, and that of hydrogen is 1)

1 mole of nitrogen (_____g) +
3 moles of hydrogen (_____ g) →

2 moles of ammonia (_____ g)

4. Give the salient features of "Modern atomic theory".

IX. Solve the following problems

1. How many grams are there in the following?

i. 2 moles of hydrogen molecule, H_2

ii. 3 moles of chlorine molecule, Cl_2

iii. 5 moles of sulphur molecule, S_8

iv. 4 moles of phosphorous molecule, P_4

12.Plant Anatomy and Plant Physiology

I. Choose the correct answer

1. Casparian strips are present in the _____ of the root.

a) cortex b) pith
c) pericycle d) endodermis

2. The endarch condition is the characteristic feature of

a) root b) stem
c) leaves d) flower

3. The xylem and phloem arranged side by side on same radius is called _____

a) radial b) amphivasal
c) conjoint d) None of these

4. Which is formed during anaerobic respiration

a) Carbohydrate b) Ethyl alcohol
b) Acetyl CoA d) Pyruvate

6. Oxygen is produced at what point during photosynthesis ?

a) when ATP is converted to ADP
b) when CO_2 is fixed
c) when H_2O is splitted
d) All of these

II. Fill in the blanks.

1. The innermost layer of cortex in root is called _____.
2. Xylem and phloem are arranged in an alternate radii constitute a vascular bundle called _____.
4. The source of O_2 liberated in photosynthesis is _____.

III. State whether the statements are true or false. Correct the false statement.

1. Phloem tissue is involved in the transport of water in plant.
2. The waxy protective covering of a plant is called as cuticle.
3. In monocot stem cambium is present in between xylem and phloem.
4. Palisade parenchyma cells occur below upper epidermis in dicot root.
6. Anaerobic respiration produces more ATP than aerobic respiration.

IV. Match the following

1. Amphicribal - *Dracaena*
2. Cambium - Translocation of food
3. Amphivasal - Fern
4. Xylem - Secondary growth
5. Phloem - Conduction of water

V. Answer in a sentence

1. What is collateral vascular bundle?
2. Where does the carbon that is used in photosynthesis come from?
3. What is the common step in aerobic and anaerobic pathway?
4. Name the phenomenon by which carbohydrates are oxidized to release ethyl alcohol.

VI. Short answer questions

1. Give an account on vascular bundle of dicot stem.
2. Write a short note on mesophyll.
4. Name the three basic tissues system in flowering plants.
5. What is photosynthesis and where in a cell does it occur?
6. What is respiratory quotient?
7. Why should the light dependent reaction occur before the light independent reaction?
8. Write the reaction for photosynthesis?

VII. Long answer questions

1. Differentiate the following

   b) Aerobic and Anaerobic respiration

3. 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?

VIII. Higher Order Thi king Skills(HOTS)

1. The reactions of photosynthesis make up a biochemical pathway.
   A) What are the end product of light and dark reaction of photosynthesis?
   B) Explain how the biochemical pathway of photosynthesis recycles many of its own reactions and identify the recycled reactants.
2. Where do the light dependent reaction and the Calvin cycle occur in the chloroplast?

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SECOND REVISION BOOK BACK QUESTION BANK -2022

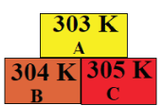
3.Thermal Physics

I. Choose the correct answer

2. If a substance is heated or cooled, the change in mass of that substance is
   a) positive b) negative
   c) zero d) none of the above

4. Temperature is the average _____ of the molecules of a substance
   a) difference in K.E and P.E
   b) sum of P.E and K.E
   c) difference in T.E and P.E
   d) difference in K.E and T.E

5. In the Given diagram, the possible direction of heat energy transformation is



a)A ← B, A ← C,B ←C
b)A → B, A → C,B → C
c)A → B, A ← C,B → C
d)A ← B, A → C,B ← C

II. Fill in the blanks:

1. The value of Avogadro number _____
2. The temperature and heat are _____ quantities
3. One calorie is the amount of heat energy required to raise the temperature of _____ of water through_____.
4. According to Boyle's law, the shape of the graph between pressure and reciprocal of volume is _____

III. State whether the following statements are true or false, if false explain why?

2. Thermal energy always flows from a system at higher temperature to a system at lower temperature.
3. According to Charles's law, at constant pressure, the temperature is inversely proportional to volume.

V. Assertion and reason type questions

a. Both the assertion and the reason are true and the reason is the correct explanation of the assertion.

b. Both the assertion and the reason are true but the reason is not the correct explanation of the assertion.

c. Assertion is true but the reason is false.

d. Assertion is false but the reason is true.

1. **Assertion:** There is no effects on other end when one end of the rod is only heated.
   Reason: Heat always flows from a region of lower temperature to higher temperature of the rod.
2. **Assertion:** Gas is highly compressible than solid and liquid
   Reason: Interatomic or intermolecular distance in the gas is comparably high.

VI. Answer in briefly

1. Define one calorie.
4. State Boyle's law
5. State-the law of volume
6. Distinguish between ideal gas and real gas.

IX. HOT question

If you keep ice at 0°C and water at 0°C in either of your hands, in which hand you will feel more chillness? Why?

4.Electricity

I. Choose the best answer

1. Which of the following is correct?
   a) Rate of change of charge is electrical power.
   b) Rate of change of charge is current.
   c) Rate of change of energy is current.
   d) Rate of change of current is charge.

2. SI unit of resistance is
   a) mho b) joule
   c) ohm d) ohm meter

3. In a simple circuit, why does the bulb glow when you close the switch?
   a) The switch produces electricity.
   b) Closing the switch completes the circuit.
   c) Closing the switch breaks the circuit.
   d) The bulb is getting charged.

4. Kilowatt hour is the unit of

a) resistivity b) conductivity

c) electrical energy d) electrical power

II. Fill in the blanks

1. When a circuit is open, _____ cannot pass through it.
2. The ratio of the potential difference to the current is known as _____.
4. The power of an electric device is a product of _____ and _____.

III. State whether the following statements are true or false: If false correct the statement.

1. Ohm's law states the relationship between power and voltage.
3. The SI unit for electric current is the coulomb.
4. One unit of electrical energy consumed is equal to 1000 kilowatt hour.

IV. Match the items in column-I to the items in column-II:

Column - I	Column - II
(i) electric current	(a) volt
(ii) potential difference	(b) ohm meter
(iii) specific resistance	(c) watt
(iv) electrical power	(d) joule
(v) electrical energy	(e) ampere

V. Assertion and reason type questions:

Mark the correct choice as

a) if both the assertion and the reason are true and the reason is the correct explanation of the assertion.

b) if both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.

c) if the assertion is true, but the reason is false.

d) if the assertion is false, but the reason is true.

2. **Assertion:** In a simple battery circuit the point of highest potential is the positive terminal of the battery.

Reason: The current flows towards the point of the highest potential

VI. Very short answer questions.

1. Define the unit of current.
2. What happens to the resistance, as the conductor is made thicker?
4. Name any two devices, which are working on the heating effect of the electric current.

VII. Short answer questions

1. Define electric potential and potential difference.
3. State Ohm's law.
4. Distinguish between the resistivity and conductivity of a conductor.

VIII. Long answer questions.

2. a) What is meant by electric current?
   b) Name and define its unit.
   c) Which instrument is used to measure the electric current? How should it be connected in a circuit?
3. a) State Joule's law of heating.

IX. Numerical problems:

1. An electric iron consumes energy at the rate of 420 W when heating is at the maximum rate and 180 W when heating is at the minimum rate. The applied voltage is 220 V. What is the current in each case?
2. A 100 watt electric bulb is used for 5 hours daily and four 60 watt bulbs are used for 5 hours daily. Calculate the energy consumed (in kWh) in the month of January.
3. A torch bulb is rated at 3 V and 600 mA. Calculate it's

   a) power b) resistance

   c) energy consumed if it is used for 4 hour.

X. HOTS:

2. How many electrons are passing per second in a circuit in which there is a current of 5 A?
3. A piece of wire of resistance 10 ohm is drawn out so that its length is increased to three times its original length. Calculate the new resistance.

8.Periodic Classification of Elements

I. Choose the best answer.

1. The number of periods and groups in the periodic table are_____.
   a) 6,16 b) 7,17
   c) 8,18 d) 7,18

2. The basis of modern periodic law is_____.
   a) atomic number
   b) atomic mass
   c) isotopic mass
   d) number of neutrons

3. _____ group contains the member of halogen family.
   a) 17^{th} b) 15^{th}
   c) 18^{th} d) 16^{th}

5. Chemical formula of rust is _____.
   a) $FeO.xH_2O$ b) $FeO_4.xH_2O$
   c) $Fe_2O_3.xH_2O$ d) FeO

7. The process of coating the surface of metal with a thin layer of zinc is called_____.
   a) painting b) thinning
   c) galvanization d) electroplating

8. Which of the following have inert gases 2 electrons in the outermost shell.
   a) He b) Ne
   c) Ar d) Kr

10. _____ is an important metal to form amalgam.
    a) Ag b) Hg
    c) Mg d) Al

II. Fill in the blanks

2. _____ is the longest period in the periodical table.

3. _____ forms the basis of modern periodic table.

6. The scientist who propounded the modern periodic law is _____.

8. _____ and _____ are called inner transition elements.

10. The chemical name of rust is _____.

III. Match the following

1. Galvanisation	-	Noble gas elements
2. Calcination	-	Coating with Zn
3. Redox reaction	-	Silver-tin amalgam
4. Dental filling	-	Alumino thermic process
5. Group 18 elements	-	Heating in the absence of air

IV. True or False: (If false give the correct statement)

1. Moseley's periodic table is based on atomic mass.

5. An alloy is a heterogenous mixture of metals.

V. Assertion and Reason

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.
ii) A is correct, R is wrong.
iii) A is wrong, R is correct.
iv) A and R are correct, R doesn't explains A.

2. **Assertion :** Magnesium is used to protect steel from rusting
   Reason : Magnesium is more reactive than iron

VI. Short answer questions

4. State two conditions necessary for rusting of iron.

9.Solutions

I. Choose the correct answer.

1. A solution is a _____ mixture.
   a. homogeneous b. heterogeneous
   c. homogeneous and heterogeneous
   d. non homogeneous

2. The number of components in a binary solution is _____
   a. 2 b. 3
   c. 4 d. 5

3. Which of the following is the universal solvent?
   a. Acetone b. Benzene
   c. Water d. Alcohol

4. A solution in which no more solute can be dissolved in a definite amount of solvent at a given temperature is called _____
   a. Saturated solution
   b. Un saturated solution
   c. Super saturated solution
   d. Dilute solution

5. Identify the non aqueous solution.
   a. sodium chloride in water
   b. glucose in water
   c. copper sulphate in water
   d. sulphur in carbon-di-sulphide

7. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____.
   a. 12g b. 11g c. 16g d. 20g

9. Deliquescence is due to _____
   a. Strong affinity to water
   b. Less affinity to water
   c. Strong hatred to water
   d. Inertness to water

10. Which of the following is hygroscopic in nature?
    a. ferric chloride
    b. copper sulphate penta hydrate
    c. silica gel
    d. none of the above

II. Fill in the blanks

1. The component present in lesser amount, in a solution is called _____
2. Example for liquid in solid type solution is _____

III. Match the following

1. Blue vitriol	– $CaSO_4 \cdot 2H_2O$
2. Gypsum	– CaO
3. Deliquescence	– $CuSO_4 \cdot 5H_2O$
4. Hygroscopic	– NaOH

IV. True or False: (If false give the correct statement)

1. Solutions which contain three components are called binary solution.
2. In a solution the component which is present in lesser amount is called solvent.
3. Sodium chloride dissolved in water forms a non-aqueous solution.
4. The molecular formula of green vitriol is $MgSO_4 \cdot 7H_2O$
5. When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature

V. Short answer

1. Define the term: Solution
2. What is mean by binary solution
3. Give an example each i) gas in liquid ii) solid in liquid iii) solid in solid iv) gas in gas
4. What is aqueous and non-aqueous solution? Give an example.
7. Define Hydrated salt.
8. A hot saturated solution of copper sulphate forms crystals as it cools. Why?
9. Classify the following substances into deliquescent, hygroscopic.

   Conc. Sulphuric acid, Copper sulphate penta hydrate, Silica gel, Calcium chloride, and Gypsum salt.

VI. Long answer:

1. Write notes on i) saturated solution
   ii) unsaturated solution
3. a) What happens when $MgSO_4 \cdot 7H_2O$ is heated? Write the appropriate equation
4. In what way hygroscopic substances differ from deliquescent substances.

VII. HOTS

2. 'A' is a blue coloured crystaline salt. On heating it loses blue colour and to give 'B'. When water is added, 'B' gives back to 'A'. Identify A and B, write the equation.

14.Transportation in Plants and Circulation in Animals

I. Choose the correct answer

1. Active transport involves
   a) movement of molecules from lower to higher concentration
   b) expenditure of energy
   c) it is an uphill task
   d) all of the above

2. Water which is absorbed by roots is transported to aerial parts of the plant through

a) cortex b) epidermis

c) phloem d) xylem

3. During transpiration there is loss of

a) carbon dioxide b) oxygen

c) water d) none of the above

4. Root hairs are

a) cortical cell b) projection of epidermal cell

c) unicellular d) both b and c

5. Which of the following process requires energy?

a) active transport b) diffusion

c) osmosis d) all of them

6. The wall of human heart is made of

a) Endocardium b) Epicardium

c) Myocardium d) All of the above

8. A patient with blood group **O** was injured in an accident and has blood loss. Which group of blood should be used by doctor for transfusion?

a) O group b) AB group

c) A or B group d) all blood group

9. **'Heart of heart'** is called

a) SA node b) AV node

c) Purkinje fibres d) Bundle of His

10. Which one of the following shows correct composition of blood

a) Plasma - Blood + Lymphocyte

b) Serum - Blood + Fibrinogen

c) Lymph - Plasma + RBC + WBC

d) Blood - Plasma + RBC+ WBC +Platelets

II. Fill in the blanks

1. _____ involves evaporative loss of water from aerial parts.

2. Water enters into the root hair cell through _____ membrane.

3. Part of the root that absorbs water from the soil is _____.

5. The normal human heartbeat rate is about _____ time per minute.

III. Match the following

Section I

1. Symplastic pathway	-	Leaf
2. Transpiration	-	Plasmodesmata
3. Osmosis	-	Pressure in xylem
4. Root Pressure	-	Pressure gradient

Section II

1. Leukemia	-	Thrombocytes
2. Platelets	-	Phagocyte
3. Monocytes	-	Decrease in leucocytes
4. Leucopenia	-	Blood Cancer
5. AB blood group	-	Allergic condition
6. O blood group	-	Inflammation
7. Eosinophil	-	Absence of antigen
8. Neutrophils	-	Absence of antibody

IV. State whether True or False. If false write the correct statement

1. The phloem is responsible for the translocation of food.
2. Plants lose water by the process of transpiration.
3. The form of sugar transported through the phloem is glucose.
4. In apoplastic movement the water travels through the cell membrane and enter the cell.
5. When guard cells lose water the stoma opens.
6. Initiation and stimulation of heart beat take place by nerves.
8. WBC defend the body from bacterial and viral infections.

V. Answer in a word or sentence

1. Name two layered protective covering of human heart.
2. What is the shape of RBC in human blood?
3. Why is the colour of the blood red ?
5. Name the heart valve associated with the major arteries leaving the ventricles.

VI. Short answer questions

1. What causes the opening and closing of guard cells of stomata during transpiration?

3. 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.

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

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

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

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

11 Why is the Sinoatrial node called the pacemaker of heart?

VII. Give reasons for the following statements

1. Minerals cannot be passively absorbed by the roots.
2. Guard cells are responsible for opening and closing of stomata.
3. The movement of substances in the phloem can be in any direction.
4. Minerals in the plants are not lost when the leaf falls.
5. The walls of the right ventricle are thicker than the right auricles.
6. Mature RBC in mammals do not have cell organelles.

VIII. Long answer questions

1. How do plants absorb water? Explain.
2. What is transpiration? Give the importance of transpiration.
3. Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.
4. Differentiate between systole and diastole. Explain the conduction of heart beat.
5. Enumerate the functions of blood.

IX. Assertion and Reasoning

Direction: In each of the following questions a statement of assertion (A) is given and a corresponding statement of reason (R) is given just below it. Mark the correct statement as.

a. If both A and R are true and R is correct explanation of A

b. If both A and R are true but R is not the correct explanation of A

c. A is true but R is false

d. Both A and R are false

1. **Assertion:** RBC plays an important role in the transport of respiratory gases.
   Reason: RBC do not have cell organelles and nucleus.
2. **Assertion:** Persons with AB blood group are called an universal recipients, because they can receive blood from all groups.
   Reason: Antibodies are absent in persons with AB blood group.

X. Higher Order Thi king Skills (HOTS)

1. When any dry plant material is kept in water, they swell up. Name and define the phenomenon involved in this change.
2. Why are the walls of the left ventricle thicker than the other chambers of the heart?

5. Transpiration is a necessary evil in plants. Explain.

16.Plant and Animal Hormones

I Choose the correct answer

1. Gibberellins cause:
   a) Shortening of genetically tall plants
   b) Elongation of dwarf plants
   c) Promotion of rooting
   d) Yellowing of young leaves
2. The hormone which has positive effect on apical dominance is:
   a) Cytokinin b) Auxin
   c) Gibberellin d) Ethylene

3. Which one of the following hormones is naturally not found in plants:
   a) 2, 4-D b) GA3
   c) Gibberellin d) IAA

5. To increase the sugar production in sugarcanes they are sprayed with _____
   a) Auxin b) Cytokinin
   c) Gibberellins d) Ethylene

6. LH is secreted by
   a) Adrenal gland b) Thyroid gland
   c) Anterior pituitary d) Hypothalamus.

7. Identify the exocrine gland
   a) Pituitary gland b) Adrenal gland
   c) Salivary gland d) Thyroid gland

8. Which organ acts as both exocrine gland as well as endocrine gland
   a) Pancreas b) Kidney c) Liver d) Lungs

9. Which one is referred as "Master Gland"?
   a) Pineal gland b) Pituitary gland
   c) Thyroid gland d) Adrenal gland

II Fill in the blanks

1. _____ causes cell elongation, apical dominance and prevents abscission.

4. Gibberellins induce stem elongation in _____ plants.

5. The hormone which has negative effect on apical dominance is _____.

7. In the islets of Langerhans, beta cells secrete _____.

8. The growth and functions of thyroid gland is controlled by _____.

9. Decreased secretion of thyroid hormones in the children leads to _____.

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III a) Match Column I with Columns II and III

Column I	Column II	Column III
Auxin	*Gibberella fujikuroi*	Abscission
Ethylene	Coconut milk	Internodal elongation
Abscisic acid	Coleoptile tip	Apical dominance
Cytokinin	Chloroplast	Ripening
Gibberellins	Fruits	Cell division

III b) Match the following hormones with their deficiency states

Hormones		*Disorders*
a) Thyroxine	-	Acromegaly
b) Insulin	-	Tetany
c) Parathormone	-	Simple goitre
d) Growth hormone	-	Diabetes insipidus
e) ADH	-	Diabetes mellitus

IV State whether True or false, If false write the correct statement

1. A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin.
2. Gibberellins cause parthenocarpy in tomato.
4. Exopthalmic goiter is due to the over secretion of thyroxine.
5. Pituitary gland is divided into four lobes.
6. Estrogen is secreted by corpus luteum.

V Assertion and Reasoning

Direction: In each of the following questions a statement of assertion (A) is given and a corresponding statement of reason (R) is given just below it. Mark the correct statement as.

a. If both A and R are true and R is correct explanation of A
b. If both A and R are true but R is not the correct explanation of A
c. A is true but R is false
d. Both A and R are false

1. **Assertion:** Application of cytokinin to marketed vegetables can keep them fresh for several days.

   Reason: Cytokinins delay senescence of leaves and other organs by mobilisation of nutrients.

2. **Assertion (A):** Pituitary gland is referred as "Master gland".

   Reason (R): It controls the functioning of other endocrine glands.

3. **Assertion (A):** Diabetes mellitus increases the blood sugar levels.

   Reason (R): Insulin decreases the blood sugar levels.

VI Answer in a word or sentence

1. Which hormone promotes the production of male flowers in Cucurbits?
2. Write the name of a synthetic auxin.
3. Which hormone induces parthenocarpy in tomatoes?
4. What is the hormone responsible for the secretion of milk in female after child birth?
5. Name the hormones which regulates water and mineral metabolism in man.
6. Which hormone is secreted during emergency situation in man?
7. Which gland secretes digestive enzymes and hormones?
8. Name the endocrine glands associated with kidneys.

VII Short answer questions

1. What are synthetic auxins? Give examples.
2. What is bolting? How can it be induced artificially?
4. What will you do to prevent leaf fall and fruit drop in plants? Support your answer with reason.
5. What are chemical messengers?
6. Write the differences between endocrine and exocrine gland.

8. What are the hormones secreted by posterior lobe of the pituitary gland? Mention the tissues on which they exert their effect.
9. Why are thyroid hormones refered as personality hormone?
10. Which hormone requires iodine for its formation? What will happen if intake of iodine in our diet is low?

VIII. Long answer questions

3. Write the physiological effects of gibberellins.
4. Where are estrogens produced? What is the role of estrogens in the human body?
5. What are the conditions which occur due to lack of ADH and insulin? How are the conditions different from one another?

IX Higher Order Thi king Skills (HOTS)

1. What would be expected to happen if
   a. Gibberellin is applied to rice seedlings.
   b. A rotten fruit gets mixed with unripe fruits.
   c. When cytokinin is not added to culture medium
2. A plant hormone was first discovered in Japan when rice plants were suffering from Bakanae disease caused by *Gibberella fujikoroi*. Based on this information answer the following questions:
   a. Identify the hormone involved in this process.
   b. Which property of this hormone causes the disease?
   c. Give two functions of this hormone.
3. Senthil has high blood pressure, protruded eyeball and an increased body temperature. Name the endocrine gland involved and hormone secretion responsible for this condition.
4. Sanjay is sitting in the exam hall. Before the start of the exam , he sweats a lot, with increased rate of heart beat. Why does this condition occur?
5. Susan's father feels very tired and frequently urinates. After clinical diagnosis he was advised to take an injection daily to maintain his blood glucose level. What would be the possible cause for this? Suggest preventive measures.

17.Reproduction in Plants and Animals

I. Choose the correct answer

4. The essential parts of a flower are _____ .
   a) Calyx and Corolla
   b) Calyx and Androecium
   c) Corolla and Gynoecium
   d) Androecium and Gynoecium

6. Male gametes in angiosperms are formed by the division of _____ .
   a) Generative cell
   b) Vegetative cell
   c) Microspore mother cell
   d) Microspore

7 What is true of gametes?
   a) They are diploid
   b) They give rise to gonads
   c) They produce hormones
   d) They are formed from gonads

8. A single highly coiled tube where sperms are stored, get concentrated and mature is known as
   a) Epididymis b) Vasa efferentia
   c) Vas deferens d) Seminiferous tubules

9. The large elongated cells that provide nutrition to developing sperms are
   a) Primary germ cells b) Sertoli cells
   c) Leydig cells d) Spermatogonia

10 Estrogen is secreted by
   a) Anterior pituitary b) Primary follicle
   c) Graffian follicle d) Corpus luteum

II. Fill in the blanks

1. The embryo sac in a typical dicot at the time of fertilization is _____ .
2. After fertilization the ovary develops into _____ .

IV. State whether the following statements are True or False. Correct the false statement

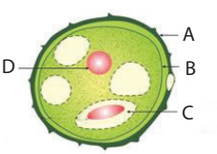
1. Stalk of the ovule is called pedicle.
2. Seeds are the product of asexual reproduction.
4. The part of the pistil which serves as a receptive structure for the pollen is called as style.
6. Sex organs produce gametes which are diploid.
7. LH is secreted by the posterior pituitary.
8. Menstrual cycle ceases during pregnancy.
10. The increased level of estrogen and progesterone is responsible for menstruation.

V. Answer in a word or sentence

1. If one pollen grain produces two male gametes, how many pollen grains are needed to fertilize 10 ovules?
2. In which part of the flower germination of pollen grains takes place?
4. Mention the function of endosperm.
6. What is the enzyme present in acrosome of sperm?
7. When is World Menstrual Hygiene Day observed?

VI. Short answer question

4. Define triple fusion.
6. Name the secondary sex organs in male
8. How can menstrual hygiene be maintained during menstrual days?
10. Identify the parts A, B, C and D



11. Write the events involved in the sexual reproduction of a flowering plant.
    a. Discuss the first event and write the types.
    b. Mention the advantages and the disadvantages of that event.
12. Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present .
13. Luteal phase of the menstrual cycle is also called the secretory phase. Give reason.

VII. Long answer questions

1. With a neat labelled diagram describe the parts of a typical angiospermic ovule.
2. What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

VIII. Higher Order Thi king Skills (HOTS)

1. In angiosperms the pollen germinates to produce pollen tube that carries two gametes. What is the purpose of carrying two gametes when single gamete can fertilize the egg?
2. Why menstrual cycle does not take place before puberty and during pregnancy ?
3. Read the following passage and answer the questions that follow

Rahini and her parents were watching a television programme. An advertisement flashed on the screen which was promoting use of sanitary napkins. Rahini's parents suddenly changed the channel, but she objected to her parents and explained the need and importance of such advertisement.

a) What is first menstruation called? When does it occur ?

b) List out the napkin hygiene measures taken during menstruation ?

c) Do you think that Rahini's objection towards her parents was correct? If so, Why?

18.Genetics

I. Choose the correct answer

1. According to Mendel alleles have the following character
   a) Pair of genes
   b) Responsible for character
   c) Production of gametes
   d) Recessive factors
2. 9 : 3 : 3 : 1 ratio is due to
   a) Segregation b) Crossing over
   c) Independent assortment d) Recessiveness
3. The region of the chromosome where the spindle fibres get attached during cell division
   a) Chromomere b) Centrosome
   c) Centromere d) Chromonema
5. The _____ units form the backbone of the DNA.
   a) 5 carbon sugar b) Phosphate
   c) Nitrogenous bases d) Sugar phosphate
6. Okasaki fragments are joined together by _____.
   a) Helicase b) DNA polymerase
   c) RNA primer d) DNA ligase
7. The number of chromosomes found in human beings are _____.
   a) 22 pairs of autosomes and 1 pair of allosomes.
   b) 22 autosomes and 1 allosome
   c) 46 autosomes
   d) 46 pairs autosomes and 1 pair of allosomes.

II. Fill in the blanks

1. The pairs of contrasting character (traits) of Mendel are called _____.
2. Physical expression of a gene is called _____
3. The thin thread like structures found in the nucleus of each cell are called _____.
4. DNA consists of two _____ chains

III. Identify whether the statement are True or False. Correct the false statement

1. A typical Mendelian dihybrid ratio of F_2 generation is 3:1.
2. A recessive factor is altered by the presence of a dominant factor.
3. Each gamete has only one allele of a gene.
4. Hybrid is an offspring from a cross between genetically different parent.
5. Some of the chromosomes have an elongated knob-like appendages known as telomere.
6. New nucleotides are added and new complementary strand of DNA is formed with the help of enzyme DNA polymerase.

IV. Match the following

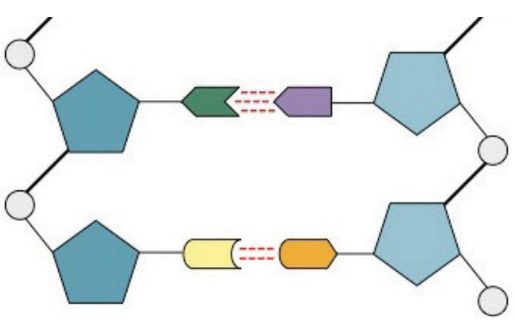
1. Autosomes - Trisomy 21
2. Diploid condition - 9:3:3:1
3. Allosome - 22 pair of chromosome
4. Down's syndrome - 2n
5. Dihybrid ratio - 23rd pair of chromosome

V. Answer in a sentence

1. What is a cross in which inheritance of two pairs of contrasting characters are studied?
2. Name the conditions when both the alleles are identical?
3. A garden pea plant produces axial white flowers. Another of the same species produced terminal violet flowers. Identify the dominant trait?
4. What is the name given to the segments of DNA, which are responsible for the inheritance of a particular character?
5. Name the bond which binds the nucleotides in a DNA.

VI. Short answers questions

1. Why did Mendel select pea plant for his experiments?
2. What do you understand by the term phenotype and genotype?
4. What are Okazaki fragments?
6. A pure tall plant (TT) is crossed with pure dwarf plant (tt), what would be the F_1 and F_2 generations? Explain.
7. Explain the structure of a chromosome.
8. Label the parts of the DNA in the diagram given below. Explain the structure briefly.



VII. Long answer questions

1. Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?
2. How is the structure of DNA organised? What is the biological significance of DNA?
3. The sex of the new born child is a matter of chance and neither of the parents may be considered responsible for it. What would be the possible fusion of gametes to determine the sex of the child?

VIII. Higher Order Thi king Skills (HOTS)

1. Flowers of the garden pea are bisexual and self-pollinated. Therefore, it is difficult to perform hybridization experiment by crossing a particular pistil with the specific pollen grains. How Mendel made it possible in his monohybrid and dihybrid crosses?
2. Pure-bred tall pea plants are first crossed with pure-bred dwarf pea plants. The pea plants obtained in F_1 generation are then selfed to produce F_2 generation of pea plants.
   a. What do the plants of F_1 generation look like?
   b. What is the ratio of tall plants to dwarf plants in F_2 generation?
   c. Which type of plants were missing in F_1 generation but reappeared in F_2 generation?
3. Kavitha gave birth to a female baby. Her family members say that she can give birth to only female babies because of her family history. Is the statement given by her family members true. Justify your answer.

IX. Value based question

1. Under which conditions does the law of independent assortment hold good and why?

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Lesson : 5, 6, 10, 11, 19, 20, 21, 22

5.Sound

I. Choose the correct answer

1. When a sound wave travels through air, the air particles
   a) vibrate along the direction of the wave motion
   b) vibrate but not in any fixed direction
   c) vibrate perpendicular to the direction of the wave motion
   d) do not vibrate

3. The frequency, which is audible to the human ear is
   a) 50 kHz b) 20 kHz
   c) 15000 kHz d) 10000 kHz

6. The sound waves are reflected from an obstacle into the same medium from which they were incident. Which of the following changes?
   a) speed b) frequency
   c) wavelength d) none of these

II. Fill up the blanks

1. Rapid back and forth motion of a particle about its mean position is called _____
2. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in _____
4. A source of sound is travelling with a velocity 40 km/h towards an observer and emits a sound of frequency 2000 Hz. If the velocity of sound is 1220 km/h, then the apparent frequency heard by the observer is _____.

III. True or false:- (If false give the reason)

1. Sound can travel through solids, gases, liquids and even vacuum.
2. Waves created by Earth Quake are Infrasonic.
4. The Velocity of sound is high in gases than liquids.

IV. Match the following

1. Infrasonic	-	(a) Compressions
2. Echo	-	(b) 22 kHz
3. Ultrasonic	-	(c) 10 Hz
4. High pressure region	-	(d) Ultrasonography

V. Assertion and Reason Questions

Mark the correct choice as

a. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

b. If both the assertion and the reason are true but the reason is not the correct explanation of the assertion.

c. Assertion is true, but the reason is false.

d. Assertion is false, but the reason is true.

2) Assertion: Sound travels faster in solids than in gases.
Reason: Solid posses a greater density than that of gases.

VI. Answer very briefly

1. What is a longitudinal wave?
2. What is the audible range of frequency?
3. What is the minimum distance needed for an echo?
5. Name three animals, which can hear ultrasonic vibrations.

VII. Answer briefly

2. Why does an empty vessel produce more sound than a filled one?
4. Explain why, the ceilings of concert halls are curved.

VIII. Problem Corner

3. A person who is sitting at a distance of 400 m from a source of sound is listening to a sound of 600 Hz. Find the time period between successive compressions from the source?

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4. An ultrasonic wave is sent from a ship towards the bottom of the sea. It is found that the time interval between the transmission and reception of the wave is 1.6 seconds. What is the depth of the sea, if the velocity of sound in the seawater is 1400 ms^{-1}?

5. A man is standing between two vertical walls 680 m apart. He claps his hands and hears two distinct echoes after 0.9 seconds and 1.1 second respectively. What is the speed of sound in the air?

IX. Answer in Detail

2. What is mean by reflection of sound? Explain:
   a) reflection at the boundary of a rarer medium
   b) reflection at the boundary of a denser medium
   c) Reflection at curved surfaces

3. a) What do you understand by the term 'ultrasonic vibration'?
   b) State three uses of ultrasonic vibrations.
   c) Name three animals which can hear ultrasonic vibrations.

4. What is an echo?
   a) State two conditions necessary for hearing an echo.
   b) What are the medical applications of echo?

X. HOT Questions

1. Suppose that a sound wave and a light wave have the same frequency, then which one has a longer wavelength?
   a) Sound b) Light
   c) both a and b d) data not sufficient

2. When sound is reflected from a distant object, an echo is produced. Let the distance between the reflecting surface and the source of sound remain the same. Do you hear an echo sound on a hotter day? Justify your answer.

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6.Nuclear Physics

I. Choose the correct answer

1. Man-made radioactivity is also known as _____
   a. Induced radioactivity
   b. Spontaneous radioactivity
   c. Artificial radioactivity d. a & c

2. Unit of radioactivity is _____
   a. roentgen b. curie
   c. becquerel d. all the above

3. Artificial radioactivity was discovered by _____
   a. Bequerel b. Irene Curie
   c. Roentgen d. Neils Bohr

4. In which of the following, no change in mass number of the daughter nuclei takes place
   i) α decay ii) β decay
   iii) γ decay iv) neutron decay
   a. (i) is correct b. (ii) and (iii) are correct
   c. (i) & (iv) are correct
   d. (ii) & (iv) are correct

5. _____ isotope is used for the treatment of cancer.
   a. Radio Iodine b. Radio Cobalt
   c. Radio Carbon d. Radio Nickel

6. Gamma radiations are dangerous because
   a. it affects eyes & bones
   b. it affects tissues
   c. it produces genetic disorder
   d. it produces enormous amount of heat

7. _____ aprons are used to protect us from gamma radiations
   a. Lead oxide b. Iron
   c. Lead d. Aluminium

8. Which of the following statements is/are correct?
   i. α particles are photons
   ii. Penetrating power of γ radiation is very low
   iii. Ionization power is maximum for α rays
   iv. Penetrating power of γ radiation is very high
   a. (i) & (ii) are correct c. (iv) only correct
   b. (ii) & (iii) are correct d. (iii) & (iv) are correct

10. In the nuclear reaction ${}_{6}X^{12} \xrightarrow{\alpha \text{ decay}} {}_{Z}Y^{A}$, the value of A & Z.

a. 8, 6 b. 8, 4

c. 4, 8 d. cannot be determined with the given data

II. Fill in the blanks

1. One roentgen is equal to _____ disintegrations per second
2. Positron is an_____.
3. Anemia can be cured by _____ isotope
4. Abbreviation of ICRP_____
5. _____is used to measure exposure rate of radiation in humans.
6. _____ has the greatest penetration power.
7. ${}_{Z}Y^{A} \rightarrow {}_{Z+1}Y^{A} + X$; Then, X is _____
8. ${}_{Z}X^{A} \rightarrow {}_{Z}Y^{A}$ This reaction is possible in _____ decay.
11. The radio isotope of _____ helps to increase the productivity of crops.
12. If the radiation exposure is 100 R, it may cause _____.

III State whether the following statements are true or false: If false, correct the statement

2. Elements having atomic number greater than 83 can undergo nuclear fusion.

IV. Match the following

Match: III

a. Soddy Fajan	Natural radioactivity
b. Irene Curie	Displacement law
c. Henry Bequerel	Mass energy equivalence
d. Albert Einstein	Artificial Radioactivity

Match: V

a. Co - 60	Age of fossil
b. I - 131	Function of Heart
c. Na - 24	Leukemia
d. C - 14	Thyroid disease

V. Arrange the following in the correct sequence:

1. **Arrange in descending order, on the basis of their penetration power**

   Alpha rays, beta rays, gamma rays, cosmic rays

2. **Arrange the following in the chronological order of discovery**

   Nuclear reactor, radioactivity, artificial radioactivity, discovery of radium.

VI. Use the analogy to fill in the blank

1. Spontaneous process : Natural Radioactivity, Induced process : _____

3. Increasing crops : Radio phosphorous, Effective functioning of heart : _____

VII. Numerical problems:

1. ${}_{88}\mathbf{Ra}^{226}$ experiences three **α** - decay. Find the number of neutrons in the daughter element.

2. A cobalt specimen emits induced radiation of 75.6 millicurie per second. Convert this disintegration in to becquerel (one curie = 3.7×10^{10} Bq)

VIII. Assertion and reason type questions:

Mark the correct choice as

(a) If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

(b) If both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.

(c) Assertion is true, but the reason is false.

(d) Assertion is false, but the reason is true.

2. **Assertion**: In a β - decay, the neutron number decreases by one.
   Reason: In β - decay atomic number increases by one.

IX. Answer in one or two word (VSA)

1. Who discovered natural radioactivity?
2. Which radioactive material is present in the ore of pitchblende?
3. Write any two elements which are used for inducing radioactivity?
4. Write the name of the electromagnetic radiation which is emitted during a natural radioactivity.
5. If A is a radioactive element which emits an α - particle and produces ${}_{104}Rf^{259}$. Write the atomic number and mass number of the element A.
7. Which hazardous radiation is the cause for the genetic disease?

8. What is the amount of radiation that may cause death of a person when exposed to it?
10. Give the SI unit of radioactivity.
11. Which material protects us from radiation?

X. Answer the following questions in few sentences.

1. Write any three features of natural and artificial radioactivity.
3. Define one roentgen.
4. State Soddy and Fajan's displacement law.
7. Mr. Ramu is working as an X - ray technician in a hospital. But, he does not wear the lead aprons. What suggestion will you give to Mr. Ramu?
9. Give any two uses of radio isotopes in the field of agriculture?

XI. Answer the following questions in detail.

2. Compare the properties of alpha, beta and gamma radiations.

XII. HOT Questions:

1. Mass number of a radioactive element is 232 and its atomic number is 90. When this element undergoes certain nuclear reactions, it transforms into an isotope of lead with a mass number 208 and an atomic number 82. Determine the number of alpha and beta decay that can occur.
2. 'X – rays should not be taken often'. Give the reason.
3. Cell phone towers should be placed far away from the residential area – why?

10.Types of Chemical Reaction

I. Choose the correct answer.

1. $H_{2(g)} + Cl_{29(g)} \rightarrow 2HCl_{(g)}$ is a
   a. Decomposition Reaction
   b. Combination Reaction
   c. Single Displacement Reaction
   d. Double Displacement Reaction

2. Photolysis is a decomposition reaction caused by _____
   a. heat b. electricity
   c. light d. mechanical energy

3. A reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ + Heat. In which of the type(s), the above reaction can be classified?
   (i) Combination Reaction
   (ii) Combustion Reaction
   (iii) DecompositionReaction
   (iv) Irreversible Reaction
   a. i and ii b. i and iv
   c. i, ii and iii d. i, ii and iv

4. The chemical equation
   $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)}\downarrow + 2NaCl_{(aq)}$
   represents which of the following types of reaction?
   a. Neutralisation
   b. Combustion
   c. Precipitation
   d. Single displacement

6. A single displacement reaction is represented by $X_{(s)} + 2HCl_{(aq)} \rightarrow XCl_{2(aq)} + H_{2(g)}$. Which of the following(s) could be X.
   (i) Zn (ii) Ag (iii) Cu (iv) Mg.
   Choose the best pair.
   a. i and ii b. ii and iii
   c. iii and iv d. i and iv

7. Which of the following is not an "element + element → compound" type reaction?
   a. $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$
   b. $2K_{(s)} + Br_{2(l)} \rightarrow 2KBr_{(s)}$
   c. $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$
   d. $4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$

8. Which of the following represents a precipitation reaction?
   a. $A_{(s)} + B_{(s)} \rightarrow C_{(s)} + D_{(s)}$
   b. $A_{(s)} + B_{(aq)} \rightarrow C_{(aq)} + D_{(l)}$
   c. $A_{(aq)} + B_{(aq)} \rightarrow C_{(s)} + D_{(aq)}$
   d. $A_{(aq)} + B_{(s)} \rightarrow C_{(aq)} + D_{(l)}$

9. The pH of a solution is 3. Its $[OH^-]$ concentration is
   a. 1×10^{-3} M c. 1×10^{-11} M
   b. 3 M d. 11 M

II. Fill in the blanks

1. A reaction between an acid and a base is called _____.
2. When lithium metal is placed in hydrochloric acid, _____ gas is evolved.

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4. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH _____ (increse/decrese)
5. The value of ionic product of water at 25^0 C is _____.
6. The normal pH of human blood is _____

III. Match the following

1. Identify the types of reaction

REACTION	TYPE
$NH_4OH_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONH_{4(aq)} + H_2O_{(l)}$	Single Displacement
$Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$	Combustion
$ZnCO_{3(s)} + \overset{Heat}{\rightarrow} ZnO_{(s)} + CO_{2(g)}$	Neutralisation
$C_2H_{4(g)} + 4O_{2(g)} \rightarrow 2CO_{2(g)} + 2H_2O_{(g)}$ + Heat	Thermal decomposition

IV. True or False: (If false give the correct statement)

1. Silver metal can displace hydrogen gas from nitric acid.
4. Periodical removal of one of the products of a reversible reaction increases the yield.
5. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic.

V. Short answer questions:

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.
7. Electrolysis is type of _____ reaction
8. The number of products formed in a synthesis reaction is _____
9. Chemical volcano is an example for _____ type of reaction
10. The ion formed by dissolution of H^+ in water is called _____
3. Define combination reaction. Give one example for an exothermic combination reaction.
4. Differentiate reversible and irreversible reactions

VI. Answer in detail

1. What are called thermolysis reactions?
2. Explain the types of double displacement reactions with examples.

VII. HOT questions

1. A solid compound 'A' decomposes on heating into 'B' and a gas 'C'. On passing the gas 'C' through water, it becomes acidic. Identify A, B and C.
2. Can a nickel spatula be used to stir copper sulphate solution? Justify your answer.

VIII. Solve the following problems

1. Lemon juice has a pH 2, what is the concentration of H^+ ions?
2. Calculate the pH of 1.0×10^{-4} molar solution of HNO_3.
3. What is the pH of 1.0×10^{-5} molar solution of KOH?
4. The hydroxide ion concentration of a solution is 1×10^{-11}M. What is the pH of the solution?

11.Carbon and its Compounds

I. Choose the best answer.

1. The molecular formula of an open chain organic compound is C_3H_6. The class of the compound is
   a. alkane b. alkene
   c. alkyne d. alcohol
2. The IUPAC name of an organic compound is 3-Methyl butan-1-ol. What type compound it is?
   a. Aldehyde b. Carboxylic acid
   c. Ketone d. Alcohol
3. The secondary suffix used in IUPAC nomenclature of an aldehyde is ____
   a. - ol b. – oic acid
   c. - al d. - one
4. Which of the following pairs can be the successive members of a homologous series?
   a. C_3H_8 and C_4H_{10}
   b. C_2H_2 and C_2H_4
   c. CH_4 and C_3H_6
   d. C_2H_5OH and C_4H_8OH

5. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a
   a. Reduction of ethanol
   b. Combustion of ethanol
   c. Oxidation of ethanoic acid
   d. Oxidation of ethanal

6. Rectified spirit is an aqueous solution which contains about _____ of ethanol
   a. 95.5 % b. 75.5 %
   c. 55.5 % d. 45.5 %

7. Which of the following are used as anaesthetics?
   a. Carboxylic acids b. Ethers
   c. Esters d. Aldehydes

II. Fill in the blanks

1. An atom or a group of atoms which is responsible for chemical characteristics of an organic compound is called _____.
2. The general molecular formula of alkynes is _____
3. In IUPAC name, the carbon skeleton of a compound is represented by _____ (root word / prefix / suffix)
4. (Saturated / Unsaturated) _____ compounds decolourize bromine water.
5. Dehydration of ethanol by conc. Sulphuric acid forms _____ (ethene/ ethane)
6. 100 % pure ethanol is called _____

III. Match the following

Functional group –OH	-	Benzene
Heterocyclic	-	Potassium stearate
Unsaturated	-	Alcohol
Soap	-	Furan
Carbocyclic	-	Ethene

IV. Assertion and Reason:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.

ii) A is correct, R is wrong.

iii) A is wrong, R is correct.

iv) A and R are correct, R doesn't explains A.

2. **Assertion**: Alkanes are saturated hydrocarbons.

   Reason: Hydrocarbons consist of covalent bonds.

V. Short answer questions

1. Name the simplest ketone and give its structural formula.
2. Classify the following compounds based on the pattern of carbon chain and give their structural formula: (i) Propane (ii) Benzene (iii) Cyclobutane (iv) Furan

VI. Long answer questions

1. What is called homologous series? Give any three of its characteristics?
2. Arrive at, systematically, the IUPAC name of the compound: $CH_3–CH_2–CH_2–OH$.
3. How is ethanol manufactured from sugarcane?

VII. HOT questions

1. The molecular formula of an alcohol is $C_4H_{10}O$. The locant number of its –OH group is 2.

   (i) Draw its structural formula.

   (ii) Give its IUPAC name.

   (iii) Is it saturated or unsaturated?

19.Orgin and Evolution of life

I Choose the correct answer

1. Biogenetic law states that _____
   a. Ontogeny and phylogeny go together
   b. Ontogeny recapitulates phylogeny
   c. Phylogeny recapitulates ontogeny
   d. There is no relationship between phylogeny and ontogeny

2. The 'use and disuse theory' was proposed by _____.
   a. Charles Darwin c. Jean Baptiste Lamarck
   b. Ernst Haeckel d. Gregor Mendel

5. The term Ethnobotany was coined by
   a. Khorana b. J.W. Harsbberger
   c. Ronald Ross d. Hugo de Vries

II Fill in the blanks

1. The characters developed by the animals during their life time, in response to the environmental changes are called _____.

4. The theory of natural selection for evolution was proposed by _____.

III State true or false. Correct the false statements

1. The use and disuse theory of organs' was postulated by Charles Darwin.

VI Short answers questions

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

3. Define Ethnobotany and write its importance.

VII Long answer questions

1. Natural selection is a driving force for evolution-How?

20.Breeding and Biotechnology

I Choose the correct answer

1. Which method of crop improvement can be practised by a farmer if he is inexperienced?
   a. clonal selection b. mass selection
   c. pureline selection d. hybridisation

5. Which of the following is used to produce products useful to humans by biotechnology techniques?
   a. enzyme from organism
   b. live organism
   c. vitamins
   d. both (a) and (b)

10. In a hexaploid wheat(2n = 6 x = 42) the haploid (n) and the basic(x) number of chromosomes respectively are
    a. n = 7 and x = 21 b. n = 21 and x = 21
    c. n = 7 and x = 7 d. n = 21 and x = 7

II Fill in the blanks

1. Economically important crop plants with superior quality are raised by_____.
2. A protein rich wheat variety is _____.
3. _____is the chemical used for doubling the chromosomes.
4. The scientific process which produces crop plants enriched with desirable nutrients is called _____.
5. Rice normally grows well in alluvial soil, but _____ is a rice variety produced by mutation breeding that grows well in saline soil.

III State whether true or false. If false, write the correct statement

1. *Raphano brassica* is a man-made tetraploid produced by colchicine treatment.
2. The process of producing an organism with more than two sets of chromosome is called mutation.
3. A group of plants produced from a single plant through vegetative or asexual reproduction are called a pureline.
4. Iron fortified rice variety determines the protein quality of the cultivated plant
7. *In vitro fertilisation* means the fertilisation done inside the body.

V Understand the assertion statement, justify the reason given and choose the correct choice

a. Assertion is correct and reason is wrong
b. Reason is correct and the assertion is wrong
c. Both assertion and reason is correct
d. Both assertion and reason is wrong.

1. **Assertion:** Hybrid is superior than either of its parents.
   Reason: Hybrid vigour is lost upon inbreeding.
2. **Assertion:** Colchicine reduces the chromosome number.
   Reason: It promotes the movement of sister chromatids to the opposite poles.

VI Answer in a sentence

1. Give the name of wheat variety having higher dietary fibre and protein.
6. State the importance of biofertiliser.

VII Short answers questions

3. Name two maize hybrids rich in amino acid lysine
4. Distinguish between
   a. somatic gene therapy and germ line gene therapy
2. Describe mutation breeding with an example.
3. Biofortification may help in removing hidden hunger. How?
5. Discuss the importance of biotechnology in the field of medicine.

7. Differentiate between outbreeding and inbreeding.

VIII Long answers questions

1. What are the effects of hybrid vigour in animals.

IX Higher Order Thi king Skills (HOTS)

1. A breeder wishes to incorporate desirable characters into the crop plants. Prepare a list of characters he will incorporate
2. Organic farming is better than Green Revolution. Give reasons
3. Polyploids are characterised by gigantism. Justify your answer.

21.Health and Disease

I. Choose the correct answer

1. Tobacco consumption is known to stimulate secretion of adrenaline. The component causing this could be
   a) Nicotine b) Tannic acid
   c) Curcumin d) Leptin
2. World 'No Tobacco Day' is observed on
   a) May 31 b) June 6
   c) April 22 d) October 2
3. Cancer cells are more easily damaged by radiations than normal cells because they are
   a) Different in structure
   b) Non-dividing
   c) Mutated Cells
   d) Undergoing rapid division
4. Which type of cancer affects lymph nodes and spleen?
   a) Carcinoma b) Sarcoma
   c) Leukemia d) Lymphoma
5. Excessive consumption of alcohol leads to
   a) Loss of memory
   b) Cirrhosis of liver
   c) State of hallucination
   d) Supression of brain function
7. Cancer of the epithelial cells is called
   a) Leukemia b) Sarcoma
   c) Carcinoma d) Lipoma
8. Metastasis is associated with
   a) Malignant tumour b) Benign tumour
   c) Both (a) and (b) d) Crown gall tumour
10. Where does alcohol effect immediately after drinking?
    a) Eyes b) Auditory region
    c) Liver d) Central nervous system

II. State whether True or False, if false write the correct statement

1. AIDS is an epidemic disease.
2. Cancer causing genes are called Oncogenes.
3. Obesity is characterized by tumour formation.
4. In leukemia both WBCs and RBCs increase in number.
5. Study of cause of disease is called etiology.
6. AIDS is not transmitted by contact with a patient's clothes.
8. Carcinogens are cancer causing agents.
9. Nicotine is a narcotic drug.
10. Cirrhosis is associated with brain disorder.

III. Expand the following abbreviations

2. HIV 3. BMI 4. AIDS

V. Fill in the blanks

1. Cirrhosis is caused in liver due to excessive use of _____
2. A highly poisonous chemicals derived from tobacco is _____
3. Blood cancer is called _____.
4. Less response of a drug to a specific dose with repeated use is called _____

VI. Analogy type questions. Identify the fir t words and their relationship and suggest a suitable word for the fourth blank

1. Communicable: AIDS: Non communicable: _____
2. Chemotherapy: Chemicals: Radiation therapy: _____

VII. Answer in a sentence

1. What are psychotropic drugs ?
2. Mention the diseases caused by tobacco smoke.
3. What are the contributing factors for Obesity?
5. What is metastasis?

VIII. Short answer questions

1. What are the various routes by which transmission of human immuno deficiency virus takes place ?
2. How is a cancer cell different from a normal cell ?
4. Why is a dietary restriction recommended for an obese individual ?

IX. Long answer questions

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

X. Higher Order Thi king Skills (HOTS)

2. Eating junk food and consuming soft drinks results in health problems like obesity, still children prefer. What are the suggestions you would give to avoid children eating junk food/ consumption of soft drinks?
3. Regular physical exercise is advisable for normal functioning of human body. What are the advantages of practising exercise in daily life?
4. A leading weekly magazine has recently published a survey analysis which says that number of AIDS patient in the country is increasing day by day. The report says that the awareness among the people about AIDS is still very poor. You are discussing the magazine report in your class and a team of your class decides to help people to fight against the dreadful disease.
   a) What problem you face when trying to educate the people in your village near by your school?
   b) How do you overcome the problem ?

XI. Value based questions

1. Once a person starts taking drugs or alcohol it is difficult to get rid of the habit. Why ?
2. Men addicted to tobacco lead to oxygen deficiency in their body. What could be the possible reason?
4. How can informational efforts change people's HIV knowledge and behaviour?

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XII. Assertion and Reasoning

In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of statements given below mark the correct answer as

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion
b. If both Assertion and Reason are true that Reason is not the correct explanation of Asssertion
c. Assertion is true but Reason is false
d. Both Assertion and Reason are false

1. **Assertion:** All drugs act on the brain.
   Reason: Drugs disturb the functioning of the body and mind.

22.Environmental Management

I. Fill in the blanks

5. Tidal energy is _____ type of energy.
6. Coal, petroleum and natural gas are called _____ fuels.
7. _____ is the most commonly used fuel for the production of electricity.

II. State whether True or False. Correct the statements which are false

1. Biogas is a fossil fuel.
4. Nuclear energy is a renewable energy.

IV. Choose the correct answer

1. Which of the following is / are a fossil fuel?
   i. Tar ii. Coal iii. Petroleum
   a) i only b) i and ii
   c) ii and iii d) i, ii and iii
3. The gas released from vehicles exhaust are
   i. carbon monoxide
   ii. Sulphur dioxide
   iii. Oxides of nitrogen
   a) i and ii b) i and iii
   c) ii and iii d) i, ii and iii
5. A renewable source of energy is
   a) petroleum b) coal
   c) nuclear fuel d) trees
8. Common energy source in village is
   a) electricity b) coal
   c) biogas d) wood and animal dung

9. Green house effect refers to
   a) cooling of earth
   b) trapping of UV rays
   c) cultivation of plants
   d) warming of earth
10. A cheap, conventional, commercial and inexhaustible source of energy is
    a) hydropower b) solar energy
    c) wind energy. d) thermal energy
11. Global warming will cause
    a) raise in level of oceans
    b) melting of glaciers
    c) sinking of islands
    d) all of these

V. Answer in a sentence

4. Why fossil fuels are to be conserved?
6. How are e-wastes generated?

VI. Short answer questions

1. What is the importance of rainwater harvesting?

VII. Long answer questions

1. How does rainwater harvesting structures recharge ground water?

VIII. Assertion and Reasoning

In each of the following question a statement of assertion(A) is given and a corresponding statement of reason (R). Of the four statements given below mark the correct answer.

a. Both assertion and reason are true and reason is correct explanation of assertion.
b. Both assertion and reason are true but reason is not the correct explanation of assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

1. **Assertion:** Rainwater harvesting is to collect and store rain water.
   Reason: Rainwater can be directed to recharge the underground water source.
2. **Assertion:** Energy efficient bulbs like CFL must be used to save electric energy.
   Reason: CFL bulbs are costlier than ordinary bulbs, hence using ordinary bulbs can save our money.

IX. Higher Order Thinking Skills (HOTS)

1. Although coal and petroleum are produced by degradation of biomass, yet we need to conserve them. Why?
2. What are the objectives for replacing non-conventional energy resources from conventional energy resources?

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