

I. Choose the correct answer. 3 x 1 =3

- Inertia of a body depends on
 - weight of the object
 - acceleration due to gravity of the planet
 - mass of the object
 - Both a & b
- The unit of 'g' is m s^{-2} . It can be also expressed as
 - cm s^{-1}
 - N kg^{-1}
 - $\text{N m}^2 \text{kg}^{-1}$
 - $\text{cm}^2 \text{s}^{-2}$
- One kilogram force equals to
 - 9.8 dyne
 - $9.8 \times 10^4 \text{ N}$
 - $98 \times 10^4 \text{ dyne}$
 - 980 dyne

II. Fill in the blanks. 2 x 1 =2

- To produce a displacement _____ is required
- 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: 3 x 1 =3

- The linear momentum of a system of particles is always conserved.
- Apparent weight of a person is always equal to his actual weight
- There is no gravity in the orbiting space station around the Earth. So the astronauts feel weightlessness.

IV. Match the following (2)

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

V. Answer briefly. (answer any five) 5 x 2 =10

- Define inertia. Give its classification.
- 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
- Differentiate mass and weight.
- While catching a cricket ball the fielder lowers his hands backwards. Why?
- How does an astronaut float in a space shuttle?
- "Wearing helmet and fastening the seat belt is highly recommended for safe journey" Justify your answer using Newton's laws of motion.
- 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.
- 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.

VI Answer in detail. (answer any one) 1 x 5 =5

- State Newton's laws of motion?
- State and prove the law of conservation of linear momentum.
- Describe rocket propulsion.

I. Choose the correct answer: 3 x 1 =3

- 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
- Power of a lens is $-4D$, then its focal length is
a) $4m$ b) $-40m$
c) $-0.25 m$ d) $-2.5 m$
- 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: 3 x 1 =3

- The path of the light is called as _____
- According to Rayleigh's scattering law, the amount of scattering of light is inversely proportional to the fourth power of its _____
- Amount of light entering into the eye is controlled by _____

III. True or False. If false correct it. 2 x 1 =2

- Velocity of light is greater in denser medium than in rarer medium
- The convex lens always gives small virtual image.

IV. Match the following: (2)

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 accommodation

V. Answer Briefly (answer any five) 5 x 2 =10

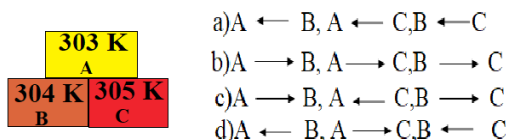
- State Snell's law.
- Draw a ray diagram to show the image formed by a convex lens when the object is placed between F and $2F$.
- Define dispersion of light
- Why does the sky appear in blue colour?
- Why are traffic signals red in colour?
- An object of height $3cm$ is placed at $10cm$ from a concave lens of focal length $15cm$. Find the size of the image.
- The eyes of the nocturnal birds like owl are having a large cornea and a large pupil. How does it help them?

VI. Give the answer in detail 1 x 5 = 5
(answer any One)

- List any five properties of light
- Explain the construction and working of a 'Compound Microscope'.

I. Choose the correct answer 3 x 1 =3

- The value of universal gas constant
a) $3.81 \text{ mol}^{-1} \text{ K}^{-1}$ b) $8.03 \text{ mol}^{-1} \text{ K}^{-1}$
c) $1.38 \text{ mol}^{-1} \text{ K}^{-1}$ d) $8.31 \text{ mol}^{-1} \text{ K}^{-1}$
- If a substance is heated or cooled, the linear expansion occurs along the axis of
a) X or -X b) Y or -Y
c) both (a) and (b) d) (a) or (b)
- In the Given diagram, the possible direction of heat energy transformation is



II. Fill in the blanks 3 x 1 =3

- The value of Avogadro number _____
- One calorie is the amount of heat energy required to raise the temperature of _____ of water through _____.
- 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 x 1 =2

- For a given heat in liquid, the apparent expansion is more than that of real expansion.
- According to Charles's law, at constant pressure, the temperature is inversely proportional to volume.

IV. Match the items in column-I to the items in column-II (2)

Column-I Column-II

- Linear expansion - (a) change in volume
- Superficial expansion - (b) hot body to cold body
- Cubical expansion - (c) $1.381 \times 10^{-23} \text{ JK}^{-1}$
- Heat transformation - (d) change in length
- Boltzmann constant - (e) change in area

V. Answer in briefly (answer any Five) 5 x 2 =10

- Define one calorie.
- What is co-efficient of cubical expansion?
- State Boyle's law
- State-the law of volume
- What is co-efficient of real expansion?
- Calculate the coefficient of cubical expansion of a zinc bar. Whose volume is increased 0.25 m^3 from 0.3 m^3 due to the change in its temperature of 50 K.
- 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?

VI. Answer in detail 1 x 5 =5
(answer any one)

- Derive the ideal gas equation.
- Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

I. Choose the best answer **2 x 1 =2**

- SI unit of resistance is
a) mho b) joule
c) Ohm d) Ohm meter
- Kilowatt hour is the unit of
a) resistivity b) conductivity
c) electrical energy d) electrical power

II. Fill in the blanks **3 x 1 =3**

- When a circuit is open, _____ cannot pass through it.
- The wiring in a house consists of _____ circuits.
- 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. **3 x 1 =3**

- Ohm's law states the relationship between power and voltage.
- The SI unit for electric current is the coulomb.
- 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: **(2)**

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. short answer questions. **5 x 2 =10**

(answer any Five)

- Define the unit of current.
- Why is tungsten metal used in bulbs, but not in fuse wires?
- Name any two devices, which are working on the heating effect of the electric current.
- Define electric potential and potential difference.
- State Ohm's law.
- Distinguish between the resistivity and conductivity of a conductor.
- How many electrons are passing per second in a circuit in which there is a current of 5 A?

VI. Long answer questions. **1 x 5 =5**

(answer any one)

- State Joule's law of heating.
 - An alloy of nickel and chromium is used as the heating element. Why?
 - How does a fuse wire protect electrical appliances?
- What are the advantages of LED TV over the normal TV?
 - List the merits of LED bulb.
- A piece of wire having a resistance R is cut into five equal parts.
 - How will the resistance of each part of the wire change compared with the original resistance?
 - If the five parts of the wire are placed in parallel, how will the resistance of the combination change?
What will be ratio of the effective resistance in series connection to that of the parallel connection?

I. Choose the correct answer **4 x 1 = 4**

- Velocity of sound in a gaseous medium is 330 m s^{-1} . If the pressure is increased by 4 times without causing a change in the temperature, the velocity of sound in the gas is
a) 330 ms^{-1} b) 660 ms^{-1}
c) 156 ms^{-1} d) 990 ms^{-1}
- The velocity of sound in air at a particular temperature is 330 m s^{-1} . What will be its value when temperature is doubled and the pressure is halved?
a) 330 ms^{-1} b) 165 ms^{-1}
c) $330 \times \sqrt{2} \text{ ms}^{-1}$ d) $320 / \sqrt{2} \text{ ms}^{-1}$
- 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
- Velocity of sound in the atmosphere of a planet is 500 m s^{-1} . The minimum distance between the sources of sound and the obstacle to hear the echo, should be
a) 17m b) 20 m c) 25 m d) 50 m

II. Fill up the blanks **2 x 1 = 2**

- If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in _____
- 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)

2 x 1 = 2

- Sound can travel through solids, gases, liquids and even vacuum.
- The velocity of sound is independent of temperature.

IV. Match the following **(2)**

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

V. Answer briefly (answer any Five) 5 x 2 = 10

- What is the minimum distance needed for an echo?
- What will be the frequency sound having 0.20 m as its wavelength, when it travels with a speed of 331 m s^{-1} ?
- Name three animals, which can hear ultrasonic vibrations.
- Why does an empty vessel produce more sound than a filled one?
- Air temperature in the Rajasthan desert can reach 46°C . What is the velocity of sound in air at that temperature? ($V_0 = 331 \text{ m s}^{-1}$)
- Explain why, the ceilings of concert halls are curved.
- A sound wave has a frequency of 200 Hz and a speed of 400 m s^{-1} in a medium. Find the wavelength of the sound wave.

VI. Answer in Detail **1 x 5 = 5**
(answer any one)

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

I. Choose the correct answer **2 x 1 =2**

- 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
- Which of the following is/are correct?
 - Chain reaction takes place in a nuclear reactor and an atomic bomb.
 - The chain reaction in a nuclear reactor is controlled
 - The chain reaction in a nuclear reactor is not controlled
 - No chain reaction takes place in an atom bomba. (i) only correct b. (i) & (ii) are correct
c.(iv) only correct d. (iii) & (v) are correct

II. Fill in the blanks **2 x 1 =2**

- Abbreviation of ICRP _____
- ${}_Z Y^A \rightarrow {}_{Z+1} Y^A + X$; Then, X is _____

III State whether the following statements are true or false: If false, correct the statement **2 x 1 =2**

- Plutonium -239 is a fissionable material.
- Einstein's theory of mass energy equivalence is used in nuclear fission and fusion.

IV. Match the following **(2)**

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

V. Arrange the following in the correct sequence: **1 x 1 =1**

- 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 x 1 =1**

- Spontaneous process : Natural Radioactivity,
Induced process : _____

VII. Answer the following questions in few sentences. (answer any Five) **5 x 2 =10**

- 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)
- Which radioactive material is present in the ore of pitchblende?
- If A is a radioactive element which emits an α - particle and produces ${}_{104}\text{Rf}^{259}$. Write the atomic number and mass number of the element A.
- Which hazardous radiation is the cause for the genetic disease?
- Write any three features of natural and artificial radioactivity.
- In Japan, some of the new born children are having congenital diseases. Why?
- 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?

VIII. Answer the following questions in detail.

(answer any one) **1 x 5 =5**

- Explain the process of controlled and uncontrolled chain reactions.
- Compare the properties of alpha, beta and gamma radiations.

I. Choose the best answer. 3 x 1 =3

- Which of the following has the smallest mass?
 - 6.023×10^{23} atoms of He
 - 1 atom of He
 - 2 g of He
 - 1 mole atoms of He
- Which of the following represents 1 amu?
 - Mass of a C – 12 atom
 - Mass of a hydrogen atom
 - $1/12^{\text{th}}$ of the mass of a C – 12 atom
 - Mass of O – 16 atom
- The gram molecular mass of oxygen molecule is

a. 16 g	b. 18 g
c. 32 g	d. 17 g

II. Fill in the blanks 3 x 1 =3

- Atoms of different elements having _____ mass number, but _____ atomic numbers are called isobars.
- Relative atomic mass is otherwise known as _____
- The average atomic mass of hydrogen is _____ amu.

III. Match the following (2)

- | | | |
|------------------------------|---|------------|
| 1. 8 g of O ₂ | - | 4 moles |
| 2. 4 g of H ₂ | - | 0.25 moles |
| 3. 52 g of He | - | 2 moles |
| 4. 112 g of N ₂ | - | 0.5 moles |
| 5. 35.5 g of Cl ₂ | - | 13 moles |

IV. True or False: (If false give the correct statement) 2 x 1 =2

- Two elements sometimes can form more than one compound.
- Molar mass of CO₂ is 42g.

V. Short answer questions 5 x 2 =10

(answer any Five)

- Define : Relative atomic mass.
- Write the different types of isotopes of oxygen and its percentage abundance.
- Define : Atomicity
- What is Molar volume of a gas?
- Find the percentage of nitrogen in ammonia.
- Calcium carbonate is decomposed on heating in the following reaction



How many moles of Calcium carbonate are involved in this reaction?

- Calculate the % of oxygen in Al₂(SO₄)₃. (Atomic mass: Al-12, O-16, S -32)

VI. Long answer questions 1 x 5 =5

(answer any one)

- Calculate the number of moles in

i) 27g of Al	ii) 1.51×10^{23} molecules of NH ₄ Cl
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- Give the salient features of “Modern atomic theory”.
- Derive the relationship between Relative molecular mass and Vapour density.

I. Choose the best answer. **3 x 1 =3**

- The number of periods and groups in the periodic table are_____.
a) 6,16 b) 7,17
c) 8,18 d) 7,18
- Which of the following have inert gases 2 electrons in the outermost shell.
a) He b) Ne
c) Ar d) Kr
- _____ is an important metal to form amalgam.
a) Ag b) Hg
c) Mg d) Al

II. Fill in the blanks **3 x 1 =3**

- If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of bonding is _____
- If the distance between two Cl atoms in Cl_2 molecule is 1.98\AA , then the radius of Cl atom is _____.
- The chemical name of rust is _____.

III. Match the following **(2)**

- | | |
|----------------------|---------------------------------|
| 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) **2 x 1 =2**

- Moseley's periodic table is based on atomic mass.
- Al wires are used as electric cables due to their silvery white colour.

V. Short answer questions **5 x 2 =10**

(answer any Five)

- A is a reddish brown metal, which combines with O_2 at $< 1370\text{ K}$ gives B, a black coloured compound. At a temperature $> 1370\text{ K}$, A gives C which is red in colour. Find A,B and C with reaction.
- 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
- What is rust? Give the equation for formation of rust.
- State two conditions necessary for rusting of iron.
- Metal A belongs to period 3 and group 13. A in red hot condition reacts with steam to form B. A with strong alkali forms C. Find A,B and C with reactions
- Name the acid that renders aluminium passive. Why?
- Identify the bond between H and F in HF molecule.

VI. Long answer questions **1 x 5 =5**

(answer any one)

- a) State the reason for addition of caustic alkali to bauxite ore during purification of bauxite.
b) Along with cryolite and alumina, another substance is added to the electrolyte mixture. Name the substance and give one reason for the addition.
- Explain smelting process.

I. Choose the correct answer. 3 x 1 =3

- The number of components in a binary solution is _____
a. 2 b. 3
c. 4 d. 5
- 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
- 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 3 x 1 =3

- Example for liquid in solid type solution is _____
- Solubility is the amount of solute dissolved in _____ g of solvent.
- Volume percentage decreases with increases in temperature because _____

III. Match the following (2)

- | | | |
|------------------|---|---|
| 1. Blue vitriol | - | $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ |
| 2. Gypsum | - | CaO |
| 3. Deliquescence | - | $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ |
| 4. Hygroscopic | - | NaOH |

IV. True or False: (If false give the correct statement) 2 x 1 =2

- The molecular formula of green vitriol is $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
- When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature

V. Short answer (answer any Five) 5 x 2 =10

- Give an example each i) gas in liquid
ii) Solid in liquid iii) solid in solid
iv) gas in gas
- What is aqueous and non-aqueous solution? Give an example.
- Define Volume percentage
- The aquatic animals live more in cold region Why?
- Classify the following substances into deliquescent, hygroscopic.
Conc. Sulphuric acid, Copper sulphate penta hydrate, Silica gel, Calcium chloride, and Gypsum salt.
- Vinu dissolves 50 g of sugar in 250 ml of hot water, Sarath dissolves 50 g of same sugar in 250 ml of cold water. Who will get faster dissolution of sugar? and Why?
- Will the cool drinks give more fizz at top of the hills or at the foot? Explain

VI. Long answer: (answer any one) 1 x 5 =5

- a) What happens when $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ is heated? Write the appropriate equation
b) Define solubility
- A solution is prepared by dissolving 45 g of sugar in 180 g of water. Calculate the mass percentage of solute.

I. Choose the correct answer. 4 x 1 =4

- $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$ is a
 - Decomposition Reaction
 - Combination Reaction
 - Single Displacement Reaction
 - Double Displacement Reaction
- The reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + \text{Heat}$. In which of the type(s), the above reaction can be classified?
 - Combination Reaction
 - Combustion Reaction
 - Decomposition Reaction
 - Irreversible Reaction
 - i and ii
 - i and iv
 - i, ii and iii
 - i, ii and iv
- 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.
 - i and ii
 - ii and iii
 - iii and iv
 - i and iv
- Which of the following represents a precipitation reaction?
 - $A_{(s)} + B_{(s)} \rightarrow C_{(s)} + D_{(s)}$
 - $A_{(s)} + B_{(aq)} \rightarrow C_{(aq)} + D_{(l)}$
 - $A_{(aq)} + B_{(aq)} \rightarrow C_{(s)} + D_{(aq)}$
 - $A_{(aq)} + B_{(s)} \rightarrow C_{(aq)} + D_{(l)}$

II. Fill in the blanks 4 x 1 =4

- The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH _____
- The value of ionic product of water at $25^{\circ}C$ is _____.
- Chemical volcano is an example for _____ type of reaction
- The ion formed by dissolution of H^+ in water is called _____

III. True or False: (If false give the correct statement) 2 x 1 =2

- The pH of rain water containing dissolved gases like SO_3 , CO_2 , NO_2 will be less than 7.
- On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic.

IV. Short answer questions 5 x 2 =10

(answer any Five)

- 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.
- Why does the reaction rate of a reaction increase on raising the temperature?
- Define combination reaction. Give one example for an exothermic combination reaction.
- Differentiate reversible and irreversible reactions
- Can a nickel spatula be used to stir copper sulphate solution? Justify your answer.
- Lemon juice has a pH 2, what is the concentration of H^+ ions?
- Laundry detergent has a pH 8.5, what is the concentration of H^+ ions?

V. Answer in detail: (answer any one) 1 x 5 =5

- Explain the types of double displacement reactions with examples.
- How does pH play an important role in everyday life?

I. Choose the best answer. 4 x 1 =4

- The molecular formula of an open chain organic compound is C_3H_6 . The class of the compound is
 - alkane
 - alkene
 - alkyne
 - alcohol
- Which of the following pairs can be the successive members of a homologous series?
 - C_3H_8 and C_4H_{10}
 - C_2H_2 and C_2H_4
 - CH_4 and C_3H_6
 - C_2H_5OH and C_4H_8OH
- Rectified spirit is an aqueous solution which contains about _____ of ethanol
 - 95.5 %
 - 75.5 %
 - 55.5 %
 - 45.5 %
- TFM in soaps represents _____ content in soap
 - mineral
 - vitamin
 - fatty acid
 - carbohydrate

II. Fill in the blanks 4 x 1 =4

- In IUPAC name, the carbon skeleton of a compound is represented by _____ (root word / prefix / suffix)
- Dehydration of ethanol by conc. Sulphuric acid forms _____ (ethene/ ethane)
- The alkaline hydrolysis of fatty acids is termed as _____
- Biodegradable detergents are made of _____ (branched / straight) chain hydrocarbons

III. Match the following (2)

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

IV. Short answer questions 5 x 2 =10

(answer any Five)

- Name the simplest ketone and give its structural formula.
- Classify the following compounds based on the pattern of carbon chain and give their structural formula: (i) Propane (ii) Benzene (iii) Cyclobutane (iv) Furan
- How is ethanoic acid prepared from ethanol? Give the chemical equation.
- How do detergents cause water pollution? Suggest remedial measures to prevent this pollution?
- Differentiate soaps and detergents.
- Give the balanced chemical equation of the following reactions:
Neutralization of NaOH with ethanoic acid.
- The molecular formula of an alcohol is $C_4H_{10}O$. The locant number of its -OH group is 2.
 - Draw its structural formula.
 - Give its IUPAC name.

V. Long answer questions 1 x 5 =5

(answer any one)

- Arrive at, systematically, the IUPAC name of the compound: $CH_3-CH_2-CH_2-OH$.
- Explain the mechanism of cleansing action of soap.

I. Choose the correct answer **3 x 1 = 3**

- Casparian strips are present in the _____ of the root.
 - cortex
 - pith
 - pericycle
 - endodermis
- Oxygen is produced at what point during photosynthesis?
 - when ATP is converted to ADP
 - when CO₂ is fixed
 - when H₂O is splitted
 - All of these
- Which is formed during anaerobic respiration
 - Carbohydrate
 - Ethyl alcohol
 - Acetyl CoA
 - Pyruvate

II. Fill in the blanks. **3 x 1 = 3**

- Cortex lies between _____.
- Xylem and phloem occurring on the same radius constitute a vascular bundle called _____.
- _____ is ATP factory of the cells

III. State whether the statements are true or false. Correct the false statement. **2 x 1 = 2**

- The waxy protective covering of a plant is called as cuticle.
- Palisade parenchyma cells occur below upper epidermis in dicot root.

IV. Match the following **(2)**

- Amphicribal - *Dracaena*
- Cambium - Translocation of food
- Amphivasal - Fern
- Xylem - Secondary growth
- Phloem - Conduction of water

V. Short answer questions **5 x 2 = 10****(answer any Five)**

- What is collateral vascular bundle?
- Where does the carbon that is used in photosynthesis come from?
- Name the phenomenon by which carbohydrates are oxidized to release ethyl alcohol.
- Write a short note on mesophyll.
- Draw and label the structure of oxysomes.
- Write the reaction for photosynthesis?
- Where do the light dependent reaction and the Calvin cycle occur in the chloroplast.

VI. Long answer questions **1 x 5 = 5****(answer any One)**

- The reactions of photosynthesis make up a biochemical pathway.
 - What are the reactants and products for both light and dark reactions.
 - Explain how the biochemical pathway of photosynthesis recycles many of its own reactions and identify the recycled reactants.
- Describe and name three stages of cellular respiration that aerobic organisms use to obtain energy from glucose.

I. Choose the correct answer 3 x 1 = 3

- In leech locomotion is performed by
 a) Anterior sucker b) Posterior sucker
 c) Setae d) none of the above
- The body of leech has
 a) 23 segments b) 33 segments
 c) 38 segments d) 30 segments
- The animals which give birth to young ones are
 a) Oviparous b) Viviparous
 c) Ovoviviparous d) All the above

II. Fill in the blanks 3 x 1 = 3

- The existence of two sets of teeth in the life of an animal is called _____ dentition.
- The blood sucking habit of leech is known as _____.
- _____ spinal nerves are present in rabbit.

III. Identify whether the statements are True or False. Correct the false statement 2 x 1 = 2

- The vas deferens serves to transport the ovum.
- The rabbit has a third eyelid called tympanic membrane which is movable.

IV. Match columns I, II and III correctly (2)

Organs	Membranous Covering	Location
Brain	pleura	abdominal cavity
Kidney	capsule	mediastinum
Heart	meninges	enclosed in thoracic cavity
Lungs	pericardium	cranial cavity

V. Short answer questions 5 x 2 = 10
(Answer any Five)

- How does leech respire?
- Write the dental formula of rabbit.
- What does CNS stand for?
- List out the parasitic adaptations in leech.
- Arjun is studying in tenth standard. He was down with fever and went to meet the doctor. As he went to the clinic he saw a patient undergoing treatment for severe leech bite. Being curious, Arjun asked the doctor why leech bite was not felt as soon as it attaches to the skin? What would have been the reply given by the doctor?
- Leeches do not have secretion of digestive juices and enzymes -Why?
- How is the digestive system of rabbit suited for herbivorous mode of feeding?

VI. Long answer questions 1 x 5 = 5
(answer any One)

- How is the circulatory system designed in leech to compensate the heart structure?
- Explain the male reproductive system of rabbit with a labelled diagram.

I. Choose the correct answer 2 x 1 =2

- Root hairs are
 - Cortical cell
 - projection of epidermal cell
 - unicellular
 - both b and c
- The wall of human heart is made of
 - Endocardium
 - Epicardium
 - Myocardium
 - All of the above

II. Fill in the blanks 2 x 1 =2

- Water enters the root cell through a _____ plasma membrane.
- The normal human heartbeat rate is about _____ time per minute.

III. Match the following (2)

- Symplastic pathway - Leaf
- Transpiration - Plasmodesmata
- Osmosis - Pressure in xylem
- Root Pressure - Pressure gradient

IV. State whether True or False. If false write the correct statement 2 x 1 =2

- The form of sugar transported through the phloem is glucose.
- The closure of the mitral and tricuspid valves at the start of the ventricular systole produces the first sound 'LUBB'.

V. Answer in a word or sentence 2 x 1 = 2

- Why is the colour of the blood red ?
- Name the heart valve associated with the major arteries leaving the ventricles.

VI. Give reasons for the following statements 2 x 2 =4

- Mature RBC in mammals do not have cell organelles?
- Guard cells are responsible for opening and closing of stomata.

VII. Short answer questions 3 x 2 = 6

(answer any Three)

- What causes the opening and closing of guard cells of stomata during transpiration?
- What would happen to the leaves of a plant that transpires more water than its absorption in the roots?
- Why is the circulation in man referred to as double circulation?
- Who discovered Rh factor? Why was it named so?
- Why is the Sinoatrial node called the pacemaker of heart?

VIII. Long answer questions 1 x 5 = 5

(answer any One)

- How do plants absorb water? Explain.
- Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.
- Enumerate the functions of blood.

I. Choose the correct answer **3 x 1 =3**

1. Site for processing of vision, hearing, memory, speech, intelligence and thought is
(a) kidney (b) ear
(c) brain (d) lungs
2. Dendrites transmit impulse _____ cell body and axon transmit impulse _____ cell body.
(a) away from, away from
(b) towards, away from
(c) towards,towards
(d) away from, towards
3. There are _____ pairs of cranial nerves and _____ pairs of spinal nerves.
(a) 12, 31 (b) 31, 12 (c) 12, 13 (d) 12, 21

II. Fill in the blanks **3 x 1 =3**

1. _____ is the longest cell in our body.
2. A neuron contains all cell organelles except _____ .
3. The part of human brain which acts as relay center is _____ .

III. State whether true or false, if false write the correct statement **2 x 1 =2**

1. Sympathetic nervous system is a part of central nervous system.
2. Cerebrospinal fluid provides nutrition to brain.

IV. Match the following **(2)**

Column I	Column II
A. Nissil's granules	Forebrain
B. Hypothalamus	Peripheral Nervous system
C. Cerebellum	Cyton
D. Schwann cell	Hindbrain

V. Short answer question (answer any five) **5 x 2 =10**

1. Define stimulus.
2. Name the parts of the hind brain.
3. What are the structures involved in the protection of brain?
4. Give an example for conditioned reflexes.
5. Define reflex arc.
6. Voluntary and involuntary actions.
7. Medullated and non-medullated nerve fibre.

VI. Long answer question **1 x 5 =5**
(answer any one)

1. With a neat labelled diagram explain the structure of a neuron.
2. What will you do if someone pricks your hand with a needle? Elucidate the pathway of response with a neat labelled diagram.

I Choose the correct answer 4 x 1 = 4

- Which one of the following hormones is naturally not found in plants:
 - 2, 4-D
 - GA3
 - Gibberellin
 - IAA
- Avena coleoptile test was conducted by
 - Darwin
 - N. Smit
 - Paal
 - F.W. Went
- LH is secreted by
 - Adrenal gland
 - Thyroid gland
 - Anterior pituitary
 - Hypothalamus.
- Which one is referred as "Master Gland"?
 - Pineal gland
 - Pituitary gland
 - Thyroid gland
 - Adrenal gland

II Fill in the blanks 2 x 1 = 2

- _____ is a gaseous hormone involved in abscission of organs and acceleration of fruit ripening.
- In the islets of Langerhans, beta cells secrete _____.

III .Match Column I with Columns II and III

(2)

Column I	Column II	Column III
Auxin	<i>Gibberella fujikuroi</i>	Abscission
Ethylene	Coconut milk	Internodal elongation
Absciscic acid	Coleoptile tip	Apical dominance
Cytokinin	Chloroplast	Ripening
Gibberellins	Fruits	Cell division

IV State whether True or false, If false write the correct statement 2 x 1 =2

- A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin.
- Estrogen is secreted by corpus luteum.

V. Short answer questions (Answer any Five)

- a) Which hormone promotes the production of male flowers in Cucurbits?
b) Name the hormones which regulates water and mineral metabolism in man.
- What are synthetic auxins? Give examples.
- What is bolting? How can it be induced artificially?
- What will you do to prevent leaf fall and fruit drop in plants? Support your answer with reason.
- What is the role of parathormone?
- What are the hormones secreted by posterior lobe of the pituitary gland? Mention the tissues on which they exert their effect.
- Senthil has high blood pressure, protruded eyeball and an increased body temperature. Name the endocrine gland involved and hormone secretion responsible for this condition.

VI. Long answer questions 1 x 5 = 5

(Answer any one)

- (a) Name the gaseous plant hormone. Describe its three different actions in plants.
(b) Which hormone is known as stress hormone in plants? Why?
- Where are estrogens produced? What is the role of estrogens in the human body?
- What are the conditions which occur due to lack of ADH and insulin? How are the conditions different from one another?

I. Choose the correct answer 4 x 1 =4

- The plant which propagates with the help of its leaves is _____ .
a) Onion b) Neem
c) Ginger d) *Bryophyllum*
- Syngamy results in the formation of _____ .
a) Zoospores b) Conidia
c) Zygote d) Chlamydozoospores
- The large elongated cells that provide nutrition to developing sperms are
a) Primary germ cells b) Sertoli cells
c) Leydig cells d) Spermatogonia
- Which one of the following is an IUCD?
a) Copper – T b) Oral pills
c) Diaphragm d) Tubectomy

II. Fill in the blanks 2 x 1 =2

- After fertilization the ovary develops into _____ .
- _____ is the first secretion from the mammary gland after child birth

III. Match the following terms with (2) their respective meanings

- | | | |
|-----------------|---|--|
| a) Parturition | - | 1) Duration between pregnancy and birth |
| b) Gestation | - | 2) Attachment of zygote to endometrium |
| c) Ovulation | - | 3) Delivery of baby from uterus |
| d) Implantation | - | 4) Release of egg from Graafian follicle |

IV. State whether the following statements are True or False. Correct the false statement 2 x 1 =2

- Seeds are the product of asexual reproduction.
- The increased level of estrogen and progesterone is responsible for menstruation.

V. Short answer question (answer any five) 5 x 2 =10

- In which part of the flower germination of pollen grains takes place?
 - What is the enzyme present in acrosome of sperm?
- Name the part of the human female reproductive system where the following occurs.
a. Fertilization b. Implantation
- Why is vegetative propagation practiced for growing some type of plants?
- Define triple fusion.
- Name the secondary sex organs in male.
- How can menstrual hygiene be maintained during menstrual days?
- How does developing embryo gets its nourishment inside the mother's body?

VI. Long answer questions (answer any one) 1 x 5 =5

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

I. Choose the correct answer **3 x 1 =3**

- 9 : 3 : 3 : 1 ratio is due to
 - Segregation
 - Crossing over
 - Independent assortment
 - Recessiveness
- The centromere is found at the centre of the _____ chromosome.
 - Telocentric
 - Metacentric
 - Sub-metacentric
 - Acrocentric
- The number of chromosomes found in human beings are _____.
 - 22 pairs of autosomes and 1 pair of allosomes.
 - 22 autosomes and 1 allosome
 - 46 autosomes
 - 46 pairs autosomes and 1 pair of allosomes.

II. Fill in the blanks **3 x 1 =3**

- The pairs of contrasting character (traits) of Mendel are called _____.
- The thin thread like structures found in the nucleus of each cell are called _____.
- DNA consists of two _____ chains

III. Identify whether the statement are True or False.

Correct the false statement **2 x 1 =2**

- Each gamete has only one allele of a gene.
- Down's syndrome is the genetic condition with 45 chromosomes.

IV. Match the following **(2)**

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

V. Short answers questions **5 x 2 =10**
(answer any five)

- What is a cross in which inheritance of two pairs of contrasting characters are studied?
- Name the conditions when both the alleles are identical?
- What do you understand by the term phenotype and genotype?
- What are allosomes?
- What are Okazaki fragments?
- Explain the structure of a chromosome.
- Label the parts of the DNA in the diagram given below. Explain the structure briefly.
- Under which conditions does the law of independent assortment hold good and why?

VI. Long answer questions **1x 5 =5**
(answer any five)

- Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?
- How is the structure of DNA organised? What is the biological significance of DNA?

I Choose the correct answer 4 x 1 =4

- Biogenetic law states that _____
 - Ontogeny and phylogeny go together
 - Ontogeny recapitulates phylogeny
 - Phylogeny recapitulates ontogeny
 - There is no relationship between phylogeny and ontogeny
- The 'use and disuse theory' was proposed by _____.
 - Charles Darwin
 - Ernst Haeckel
 - Jean Baptiste Lamarck
 - Gregor Mendel
- The best way of direct dating fossils of recent origin is by
 - Radio-carbon method
 - Uranium lead method
 - Potassium-argon method
 - Both (a) and (c)
- The term Ethnobotany was coined by
 - Khorana
 - J.W. Harsbberger
 - Ronald Ross
 - Hugo de Vries

II Fill in the blanks 3 x 1 =3

- The degenerated and non-functional organs found in an organism are called _____.
- The forelimb of bat and human are examples of _____ organs.
- The theory of natural selection for evolution was proposed by _____.

III State true or false. Correct the false statements 3 x 1 =3

- The use and disuse theory of organs' was postulated by Charles Darwin.
- The homologous organs look similar and perform similar functions but they have different origin and developmental pattern.
- Birds have evolved from reptiles.

IV.Short answers questions (answer any five) 5 x 2 =10

- 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?
- What is the study of fossils called?
- The degenerated wing of a kiwi is an acquired character. Why is it an acquired character?
- Define Ethnobotany and write its importance.
- How can you determine the age of the fossils?
- Imprints of fossils tell us about evolution-How?
- Octopus, cockroach and frog all have eyes. Can we group these animals together to establish a common evolutionary origin. Justify your answer.

V. Long answer questions 1 x 5 =5

(answer any One)

- Natural selection is a driving force for evolution-How?
- How do you differentiate homologous organs from analogous organs?
- How does fossilization occur in plants?

I Choose the correct answer **3 x 1 =3**

- Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of _____.
a. Chilli b. maize
c. sugarcane d. wheat
- The miracle rice which saved millions of lives and celebrated its 50th birthday is _____.
a. IR b. IR 24 c. Atomita 2 d. Ponni
- Organisms with modified endogenous gene or a foreign gene are also known as
(a) transgenic organisms
(b) genetically modified
(c) mutated
(d) both a and b

II Fill in the blanks **3 x 1 =3**

- Economically important crop plants with superior quality are raised by_____.
- Similar DNA fingerprinting is obtained for _____.
- In gene cloning the DNA of interest is integrated in a _____.

III State whether true or false. If false, write the correct statement: **2 x 1 =2**

- Raphanobrassica* is a tetraploid man-made genus produced by colchicine treatment.
- Bt gene from bacteria can kill insects.

IV Match the following **(2)**

Column A	Column B
1. Sonalika	<i>Phaseolus mungo</i>
2. IR 8	Sugarcane
3. Saccharum	Semi-dwarf wheat
4. Mung No. 1	Ground nut
5. TMU – 2	Semi-dwarf Rice
6. Insulin	<i>Bacillus thuringiensis</i>
7. Bt toxin	Beta carotene
8. Golden rice	first hormone produced using rDNA technique

V. Short answers questions **5 x 2 =10**
(answer any five)

- Give the name of wheat variety having higher dietary fibre and protein.
- Name the types of stem cells.
- Name three improved characteristics of wheat that helped India to achieve high productivity.
- Distinguish between somatic gene therapy and germ line gene therapy
- State the applications of DNA fingerprinting technique.
- Differentiate between outbreeding and inbreeding.
- Organic farming is better than Green Revolution. Give reasons

VI. Long answers questions **1 x 5 =5**
(answer any One)

- Describe mutation breeding with an example.
- Biofortification may help in removing hidden hunger. How?
- With a neat labelled diagram explain the techniques involved in gene cloning.

I. Choose the correct answer 2 x 1 =2

- World 'No Tobacco Day' is observed on
a) May 31 b) June 6
c) April 22 d) October 2
- Polyphagia is a condition seen in
a) Obesity b) Diabetes mellitus
c) Diabetes insipidus d) AIDS

II. State whether True or False, if false write the correct statement 2 x 1 =2

- Obesity is characterized by tumour formation
- Cirrhosis is associated with brain disorder.

III. Expand the following abbreviations (2)

- NIDDM
- HIV

IV. Match the following (2)

1. Sarcoma	-	Stomach cancer
2. Carcinoma	-	Excessive thirst
3. Polydipsia	-	Excessive hunger
4. Polyphagia	-	Lack of blood flow to heart muscle
5. Myocardial Infarction	-	Connective tissue cancer

V. Fill in the blanks 2 x 1 =2

- Blood cancer is called _____.
- Insulin resistance is a condition in _____diabetes mellitus

VI. Analogy type questions. Identify the first words and their relationship and suggest a suitable word for the fourth blank 2 x 1 =2

- Communicable: AIDS: Non communicable: _____
- Chemotherapy: Chemicals: Radiation therapy: _____

VII. Short answer questions (answer any four) 4 x 2 =8

- What are psychotropic drugs ?
- What is metastasis?
- How does insulin deficiency occur?
- What are the various routes by which transmission of human immuno deficiency virus takes place ?
- Differentiate between Type-1 and Type-2 diabetes mellitus
- What precautions can be taken for preventing heart diseases ?
- 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?

VIII. Long answer questions 1 x 5 =5
(answer any one)

- Suggest measures to overcome the problems of an alcoholic.
- Changes in lifestyle is a risk factor for occurrence of cardiovascular diseases. Can it be modified ? If yes, suggest measures for prevention.

I. Choose the correct answer 3 x 1 =3

- The gas released from vehicles exhaust are
 - carbon monoxide
 - Sulphur dioxide
 - Oxides of nitrogen
 - i and ii
 - i and iii
 - ii and iii
 - i, ii and iii
- A renewable source of energy is
 - petroleum
 - coal
 - nuclear fuel
 - trees
- Global warming will cause
 - raise in level of oceans
 - melting of glaciers
 - sinking of islands
 - all of these

II. Fill in the blanks 3 x 1 =3

- Chipko movement is initiated against _____.
- _____ is a biosphere reserve in Tamilnadu.
- _____ is the most commonly used fuel for the production of electricity.

III. State whether True or False. Correct the statements which are false 2 x 1 =2

- Planting trees increases the groundwater level.
- Wild life protection act was established in 1972

IV. Match the following (2)

- Soil erosion - energy saving
- Bio gas - acid rain
- Natural gas - removal of vegetation
- Green house gas - renewable energy
- CFL bulbs - CO₂
- Wind - non-renewable energy
- Solid waste - lead and heavy metals

V. Short answer questions 5 x 2 =10

(answer any five)

- What would happen if the habitat of wild animals is disturbed?
- Why fossil fuels are to be conserved?
- What is the importance of rainwater harvesting?
- What are the advantages of using biogas?
- What are the environmental effect caused by sewage?
- What are the objectives for replacing non-conventional energy resources from conventional energy resources?
- Why is the Government imposing ban on the use of polythene bags and plastics? Suggest alternatives. How is this ban likely to improve the environment?

VI. Long answer questions 1 x 5 =5

(answer any one)

- How does rainwater harvesting structures recharge ground water?
- What are the sources of solid wastes? How are solid wastes managed?
- Enumerate the importance of forest.

I. Choose the best answer 5 x 1 =5

- Which software is used to create animation ?
a) Paint b) PDF
c) MS Word d) Scratch
- All files are stored in the _____
a) Folder b) Box
c) Pai d) Scanner
- Which is used to build scripts?
a) Script area b) Block palette
c) Stage d) Sprite
- Which is used to edit programs?
a) Inkscape b) script editor
c) Stage d) Sprite
- Where you will create category of blocks?
a) Block palette b) Block menu
c) Script area d) sprite

II. Match the Following (2)

1. Script Area	Type notes
2. Fold	Animation software
3. Scrat	Edit programs
4. Costume editor	Store files
5. Notepad	Build Scripts

III. Answer the following 4 x 2 =8

- What is Scratch?
- Write a short note on editor and its types?
- What is Stage?
- What is Sprite?

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