

Choose the Correct Answer for all units

1. LAWS OF MOTION

1. Inertia of a body depends on
 - a) weight of the object
 - c) mass of the object**
 - b) acceleration due to gravity of the planet
 - d) Both a & b
2. Impulse is equals to (or) Impulse is the [PTA-1]
 - a) rate of change of momentum
 - c) change of momentum**
 - b) rate of force and time
 - d) rate of change of mass
3. Newton's III law is applicable
 - a) for a body is at rest
 - c) both a & b**
 - b) for a body in motion
 - 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
5. In which of the following sport the turning of effect of force used
 - a) swimming
 - b) tennis
 - c) cycling**
 - d) hockey
6. The unit of 'g' is m s^{-2} . It can be also expressed as
 - a) cm s^{-1}
 - b) N kg^{-1}**
 - c) $\text{N m}^2 \text{kg}^{-1}$
 - d) $\text{cm}^2 \text{s}^{-2}$
7. One kilogram force equals to
 - a) 9.8 dyne
 - b) $9.8 \times 10^4 \text{ N}$
 - c) $98 \times 10^4 \text{ dyne}$**
 - 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) $\frac{M}{4}$
 - 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? [SEP-21, MDL-19]
 - 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** [JUN-23, AUG-22]

Additional Questions

11. F be the force between the two bodies placed at a certain distance. If the distance between them is doubled then the gravitational force F will be _____. [PTA-5]
 - a) 2F
 - b) $\frac{F}{2}$
 - c) $\frac{F}{4}$**
 - d) 4F
12. The force required to produce an acceleration of 1 cm s^{-2} on a body of mass 1 g is [PTA-6]
 - a) 1 N
 - b) 10 N
 - c) 10^2 dyne
 - d) 1 dyne**

2. OPTICS

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 [MAY - 2022]
 - a) f
 - b) 2f**
 - c) infinity
 - d) between f and 2f

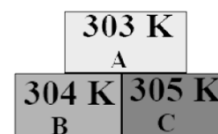
3. A small bulb is placed at the principal focus of a convex lens. When the bulb is switched on, the lens will produce [PTA – 3]
 a) a convergent beam of light b) a divergent beam of light
 c) a parallel beam of light d) a coloured beam of light
4. Magnification of a convex lens is [APR – 2023]
 a) positive b) negative c) either positive or negative d) zero
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 $2f$
6. Power of a lens is $-4D$, then its focal length is
 a) $4m$ b) $-40m$ c) $-0.25 m$ d) $-2.5 m$
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 [PTA – 2, SEP - 2020]
 a) convex lens b) concave lens c) convex mirror d) Bifocal 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) $V_B < V_G > V_R$

Additional Questions

11. The scattered light in Raman scattering contains _____ lines. [PTA – 5]
 a) stokes lines b) antistokes lines c) Rayleigh line d) all the above
12. The near point of eye is (or) In common what is the value of least distance of distinct vision of a human?
 a) $25 m$ b) $25 mm$ c) $25 cm$ d) $250 m$ [PTA - 6]

3. THERMAL PHYSICS

1. The value of universal gas constant
 a) $3.81 Jmol^{-1} K^{-1}$ b) $8.03 Jmol^{-1} K^{-1}$ c) $1.38 Jmol^{-1} K^{-1}$ d) $8.31 Jmol^{-1} K^{-1}$
2. If a substance is heated or cooled, the change in mass of that substance is [PTA – 1]
 a) positive b) negative c) zero d) none of the above
3. 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)
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) $A \leftarrow B$, $A \leftarrow C$, $B \leftarrow C$ b) $A \rightarrow B$, $A \rightarrow C$, $B \rightarrow C$
 c) $A \rightarrow B$, $A \leftarrow C$, $B \rightarrow C$ d) $A \leftarrow B$, $A \rightarrow C$, $B \leftarrow C$



Additional Questions

6. The co-efficient of linear expansion depends on _____. [PTA – 4]
 a) original length b) increasing temperature c) nature of material d) (a) and (b)
7. Variation in dimensions of any object due to rise in temperature is called as _____. [PTA – 5]
 a) thermal expansion b) thermal variation c) thermal convection d) evaporation
8. If the atoms or molecules of a gas do not interact with each other, then the gas is known as _____. [PTA – 6]
 a) a real gas b) an ideal gas c) a noble gas d) a rare gas
9. The value of Avogadro number is _____ /mol. [SEP – 2020]
 a) 6.023×10^{-23} b) 6.024×10^{24} c) 6.023×10^{23} d) 6.024×10^{-24}

4. ELECTRICITY

- 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.
- SI unit of resistance is [SEP – 2021]
 a) mho b) joule c) ohm d) ohm meter
- 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
- Kilowatt hour is the unit of [JUN – 2023, AUG – 2022, MDL – 19]
 a) resistivity b) conductivity **c) electrical energy** d) electrical power

Additional Questions

- The effective resistance of three resistors of resistances $5\ \Omega$, $3\ \Omega$ and $2\ \Omega$ are connected in series is _____.
 a) $1.03\ \Omega$ **b) $10\ \Omega$** c) $0.97\ \Omega$ d) $2.5\ \Omega$ [PTA – 2]
- Nichrome is used as heating element in electric heater, because it has [PTA – 3]
 a) high resistivity b) high melting point c) not easily oxidised **d) all the above**
- SI unit of specific resistance is _____. [PTA – 4]
 a) mho b) ohm/ metre c) ohm **d) ohm metre**

5. ACOUSTICS

- When a sound wave travels through air, the air particles [SEP – 2021]
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
- Velocity of sound in a gaseous medium is 330 ms^{-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 frequency, which is audible to the human ear is [PTA – 6]
 a) 50 kHz **b) 20 kHz** c) 15000 kHz d) 10000 kHz
- The velocity of sound in air at a particular temperature is 330 ms^{-1} . What will be its value when temperature is doubled and the pressure is halved?
 a) 330 m s^{-1} b) 165 m s^{-1} **c) $330 \times \sqrt{2}\text{ m s}^{-1}$** d) $320 / \sqrt{2}\text{ m s}^{-1}$
- If a sound wave travels with a frequency of $1.25 \times 10^4\text{ Hz}$ at 344 m s^{-1} , the wavelength will be
 a) 27.52 m b) 275.2 m **c) 0.02752 m** d) 2.752 m
- 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 ms^{-1} . The minimum distance between the sources of sound and the obstacle to hear the echo, should be
 a) 17 m b) 20 m **c) 25 m** d) 50 m

Additional Questions

- Sound waves travel in air with a speed of about _____ at NTP. [SEP – 2021]
 a) $340 \times 10^8\text{ m/s}$ **b) 340 m/s** c) $3 \times 10^8\text{ m/s}$ d) $3 \times 10^{-8}\text{ m/s}$
- Arrange the following media in descending order on the basis of speed of sound [PTA – 1]
 a) air > glass > water b) water > air > glass
 c) glass < water < air **d) glass > water > air**

6. NUCLEAR PHYSICS

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 _____. [SEP – 2021]
 a) roentgen b) curie c) becquerel d) **all the above**
3. Artificial radioactivity was discovered by _____.
 a) Becquerel **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. [PTA – 3]
 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 ray iv) Penetrating power of γ radiation is very high
 a) (i) & (ii) are correct b) (ii) & (iii) are correct
 c) (iv) only correct **d) (iii) & (iv) are correct**
9. Proton - Proton chain reaction is an example of _____.
 a) Nuclear fission b) α - decay **c) Nuclear fusion** d) β - decay
10. In the nuclear reaction ${}_6\text{X}^{12} \xrightarrow{\alpha \text{ decay}} {}_Z\text{Y}^A$, the value of A & Z.
 a) 8, 6 **b) 8, 4** c) 4, 8 d) cannot be determined with the given data
11. Kamini reactor is located at _____.
a) Kalpakkam b) Koodankulam c) Mumbai d) Rajasthan
12. Which of the following is/are correct?
 i) Chain reaction takes place in a nuclear reactor and an atomic bomb.
 ii) The chain reaction in a nuclear reactor is controlled.
 iii) The chain reaction in a nuclear reactor is not controlled.
 iv) No chain reaction takes place in an atom bomb.
 a) (i) only correct **b) (i) & (ii) are correct** c) (iv) only correct d) (iii) & (iv) are correct

Additional Questions

13. In which of the following reaction, the mass number decreases by four of the daughter nucleus?
a) α - decay b) β - decay c) γ - decay d) neutron decay [APR– 23]
14. In Beta decay [PTA – 2]
 a) mass number increases by one b) atomic number decrease by one
c) number of proton increases by one d) number of neutron increases by one
15. The elements having atomic number _____ undergo spontaneous radioactivity. [PTA – 4]
a) more than 83 b) less than 83 c) less than 73 d) equal to 83
16. _____ element emits its radiation spontaneously. [MDL – 19]
 a) Ni b) Pd c) Pt **d) U**
17. If the radiation exposure is about 100 R, it may cause _____. [JUN – 2023]
 a) Skin disorder b) Hair loss **c) Leukemia** d) Death

7. ATOMS AND MOLECULES

- 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
- Which of the following is a triatomic molecule? [MDL – 19, PTA – 1]
a) Glucose b) Helium **c) Carbon dioxide** d) Hydrogen
- The volume occupied by 4.4 g of CO_2 at S.T.P.
a) 22.4 litre **b) 2.24 litre** c) 0.24 litre d) 0.1 litre
- Mass of 1 mole of Nitrogen atom is
a) 28 amu b) 14 amu c) 28 g **d) 14 g**
- Which of the following represents 1 amu?
a) Mass of a C – 12 atom b) Mass of a hydrogen atom
c) $\frac{1}{12}$ th of the mass of a C – 12 atom d) Mass of O – 16 atom
- Which of the following statement is incorrect?
a) 12 gram of C – 12 contains Avogadro's number of atoms.
b) One mole of oxygen gas contains Avogadro's number of molecules.
c) One mole of hydrogen gas contains Avogadro's number of atoms.
d) One mole of electrons stands for 6.023×10^{23} electrons.
- The volume occupied by 1 mole of a diatomic gas at S.T.P is
a) 11.2 litre b) 5.6 litre **c) 22.4 litre** d) 44.8 litre
- In the nucleus of ${}_{20}\text{Ca}^{40}$, 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
- The gram molecular mass of oxygen molecule is [AUG - 2022]
a) 16 g b) 18 g **c) 32 g** d) 17 g
- 1 mole of any substance contains _____ molecules.
a) 6.023×10^{23} b) 6.023×10^{-23} c) 3.0115×10^{23} d) 12.046×10^{23}

Additional Questions

- The gram molecular mass of water is: [APR – 2023]
a) 2 g b) 16 g **c) 18 g** d) 8 g
- Analyse the following and choose the correct statement(s) [PTA – 4]
i) An electron has considerable mass
ii) A hetero atomic molecule is formed from different kinds of atoms.
iii) Mass number and atomic mass of an element are same.
a) i, ii and iii are correct b) i and iii are correct **c) only (ii) is correct** d) only (iii) is correct
- If a molecule is made of similar kind of atoms, then it is called _____. [MAY -22, PTA-6]
a) mono atomic molecule b) hetero atomic molecule
c) homo atomic molecule d) poly atomic molecule

8. PERIODIC CLASSIFICATION OF ELEMENTS

- The number of periods and groups in the periodic table are _____. [AUG - 2022]
a) 6, 16 b) 7, 17 c) 8, 18 **d) 7, 18**
- The basis of modern periodic law is _____.
a) atomic number b) atomic mass c) isotopic mass d) number of neutrons
- _____ group contains the member of halogen family. [PTA – 1]
a) 17th b) 15th c) 18th d) 16th
- _____ is a relative periodic property
a) atomic radii b) ionic radii c) electron affinity **d) electronegativity**
- Chemical formula of rust is _____.
a) $\text{FeO} \cdot x\text{H}_2\text{O}$ b) $\text{FeO}_4 \cdot x\text{H}_2\text{O}$ **c) $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$** d) FeO

6. In the aluminothermic process the role of Al is _____.
 a) oxidizing agent **b) reducing agent** c) hydrogenating agent d) sulphurising agent
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 inert gases have 2 electrons in the outermost shell.
a) He b) Ne c) Ar d) Kr
9. Neon shows zero electron affinity due to _____.
 a) stable arrangement of neutrons **b) stable configuration of electrons**
 c) reduced size d) increased density
10. _____ is an important metal to form amalgam. [JUN – 2023, AUG – 2022, MDL – 19]
 a) Ag **b) Hg** c) Mg d) Al

Additional Questions

11. Alloy used in the manufacturing of pressure cooker is _____. [SEP – 2021]
 a) Brass b) Bronze c) Magnalium **d) Duralumin**
12. When a sodium atom loses an electron it forms Na^+ ion. The radius of Na^+ ion is lesser than Na atom. This is because, [PTA – 3]
a) The attractive force of nucleus is more in Na^+ ion than Na atom
 b) The attractive force of nucleus is more in Na atom than Na^+ ion
 c) Number of protons present in Na atom is less than Na^+ ion
 d) Number of electrons present in Na^+ ion is more than Na atom
13. If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7 then the nature of bonding is _____. [PTA – 5]
a) Ionic b) Covalent c) Polar d) co-ordinate covalent
14. Match the following and choose the correct option given below the table. [PTA – 6]

A	Galvanisation	i	Silver-tin amalgam	a) A-i, B-ii, C-iii, D-iv
B	Calcination	ii	Coating with Zn	b) A-i, B-iv, C-iii, D-ii
C	Redox reaction	iii	Heating in the absence of air	c) A-ii, B-iii, C-iv, D-i
D	Dental filling	iv	Alumino thermic process	d) A-ii, B-iv, C-I, D-iii

9. SOLUTIONS

1. A solution is a _____ mixture.
a) homogeneous b) heterogeneous c) homogeneous & heterogeneous d) nonhomogeneous
2. The number of components in a binary solution is _____. [MAY - 2022]
a) 2 b) 3 c) 4 d) 5
3. Which of the following is the universal solvent? [APR – 2023]
 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) Unsaturated solution
 c) Super saturated solution d) Dilute solution
5. Identify the non aqueous solution. [SEP – 2020]
 a) sodium chloride in water b) glucose in water
 c) copper sulphate in water **d) sulphur in carbon-di-sulphide**
6. When pressure is increased at constant temperature, the solubility of gases in liquid _____.
 a) No change **b) increases** c) decreases d) no reaction
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) 12 g **b) 11 g** c) 16 g d) 20 g

8. A 25% alcohol solution means [PTA – 4]
 a) 25 ml alcohol in 100 ml of water b) 25 ml alcohol in 25 ml of water
 c) **25 ml alcohol in 75 ml of water** d) 75 ml alcohol in 25 ml of water
9. Deliquescence is due to _____. [PTA – 5]
 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? [JUN – 2023]
 a) ferric chloride b) copper sulphate penta hydrate
 c) **silica gel** d) none of the above

Additional Questions

11. While doing a science practical experiment, a student left a bottle opened after usage, which contained solid sodium hydroxide. When the student visited the laboratory again after few days, he found only liquid sodium hydroxide in the bottle. This is due to _____ property of sodium hydroxide.
 a) hygroscopic b) **deliquescence** c) dehydration d) dissociation [PTA – 1]
12. Volume percentage of solutions decreases with the increase in temperature due to [PTA – 2]
 a) **thermal expansion of liquids** b) cooling effect of liquids
 c) increase in concentration of solution d) decrease in concentration of solution
13. The component present in lesser amount, in a solution is called _____. [MDL – 19]
 a) **Solute** b) Solvent c) Solution d) Colloid

10. TYPES OF CHEMICAL REACTIONS

1. $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g})$ is a [JUN – 2023]
 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 $\text{C}_{(\text{s})} + \text{O}_{2(\text{g})} \rightarrow \text{CO}_{2(\text{g})} + \text{Heat}$. In which of the type(s), the above reaction can be classified?
 (i) Combination Reaction (ii) Combustion Reaction
 (iii) Decomposition Reaction (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 $\text{Na}_2\text{SO}_{4(\text{aq})} + \text{BaCl}_{2(\text{aq})} \rightarrow \text{BaSO}_{4(\text{s})} \downarrow + 2\text{NaCl}_{(\text{aq})}$ represents which of the following types of reaction?
 a) Neutralisation b) Combustion c) **Precipitation** d) Single displacement
5. Which of the following statements are correct about a chemical equilibrium?
 (i) It is dynamic in nature.
 (ii) The rate of the forward and backward reactions are equal at equilibrium.
 (iii) Irreversible reactions do not attain chemical equilibrium.
 (iv) The concentration of reactants and products may be different.
 a) **i, ii and iii** b) i, ii and iv c) ii, iii and iv d) i, iii and iv
6. A single displacement reaction is represented by $\text{X}_{(\text{s})} + 2\text{HCl}_{(\text{aq})} \rightarrow \text{XCl}_{2(\text{aq})} + \text{H}_{2(\text{g})}$. 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? [PTA – 3]
 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) $1 \times 10^{-3} M$ b) $3 M$ c) $1 \times 10^{-11} M$ d) $11 M$
10. Powdered $CaCO_3$ reacts more rapidly than flaky $CaCO_3$ because of _____.
 a) large surface area b) high pressure c) high concentration d) high temperature

Additional Questions

11. In a combustion reaction, [PTA – 2]
 a) oxygen gas is released b) nitrogen gas is released
 c) oxygen gas is utilised d) nitrogen gas is utilised
12. The amount of product formation in a reversible reaction _____ when the periodic removal of the product takes place. [PTA – 4]
 a) increases b) decreases c) first decreases then increases d) first increases and then decreases
13. In a chemical equilibrium, the concentrations of reactants and products are _____. [PTA – 5]
 a) remain different b) remain same c) cannot be predicted d) are not equal

11. CARBON AND ITS COMPOUNDS

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 [SEP – 2021]
3. The secondary suffix used in IUPAC nomenclature of an aldehyde is _____. [APR – 2023]
 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 [SEP – 2020]
 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. [MAY - 2022]
 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
8. TFM in soaps represents _____ content in soap.
 a) mineral b) vitamin c) fatty acid d) carbohydrate
9. Which of the following statement is wrong about detergents?
 a) It is a sodium salt of long chain fatty acids b) It is sodium salts of sulphonic acids
 c) The ionic part in a detergent is $-SO_3^- Na^+$ d) It is effective even in hard water

Additional Questions

10. Biodegradable detergents are made of _____. [PTA – 3]
 a) branched chain hydrocarbons b) linear chain hydrocarbons
 c) both branched and linear chain hydrocarbons d) cyclic hydrocarbons
11. Which of the following shows the right increasing order of reactivity? [PTA – 6]
 a) $\text{CH} \equiv \text{CH} < \text{CH}_4 < \text{CH}_2 = \text{CH}_2$ b) $\text{CH} \equiv \text{CH} < \text{CH}_2 = \text{CH}_2 < \text{CH}_4$
 c) $\text{CH}_4 < \text{CH}_2 = \text{CH}_2 < \text{CH} \equiv \text{CH}$ d) $\text{CH}_4 < \text{CH} \equiv \text{CH} < \text{CH}_2 = \text{CH}_2$
12. Choose the correct option that shows a perfect match in the following table. [PTA – 2]

A	Heterocyclic compound	I	Benzene	a) A-I, B-II, C-III, D-IV
B	Unsaturated compound	II	Potassium stearate	b) A-III, B-IV, C-II, D-I
C	Soap	III	Furan	c) A-II, B-I, C-IV, D-III
D	Carbocyclic compound	IV	Ethene	d) A-IV, B-II, C-III, D-I

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

1. Casparian strips are present in the _____ of the root. [JUN – 2023, MDL – 19]
 a) Cortex b) Pith c) Pericycle d) endodermis
2. The endarch condition is the characteristic feature of [AUG – 2022, MAY - 2022]
 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 [SEP – 2020, MDL – 19]
 a) Carbohydrate b) Ethyl alcohol c) Acetyl CoA d) Pyruvate
5. Krebs cycle takes place in [APR – 2023, PTA – 3]
 a) chloroplast b) mitochondrial matrix c) stomata d) inner mitochondrial membrane
6. Oxygen is produced at what point during photosynthesis (or) During photosynthesis at which of the following state, oxygen is produced. [PTA – 4]
 a) when ATP is converted to ADP b) when CO_2 is fixed
 c) when H_2O is splitted d) all of these

13. STRUCTURAL ORGANISATION OF ANIMALS

1. In leech locomotion is performed by
 a) Anterior sucker b) Parapodia c) Setae d) Contraction and relaxation of muscles
2. The segments of leech are known as
 a) Metameres (somites) b) Proglottids c) Strobila d) All the above
3. Pharyngeal ganglion in leech is a part of
 a) Excretory system b) Nervous system c) Reproductive system d) Respiratory system
4. The brain of leech lies above the
 a) Mouth b) Buccal Cavity c) Pharynx d) Crop
5. The body of leech has
 a) 23 segments b) 33 segments c) 38 segments d) 30 segments
6. Mammals are _____ animals.
 a) cold blooded b) warm blooded c) poikilothermic d) all the above

Additional Questions

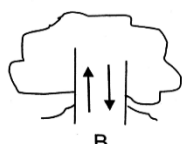
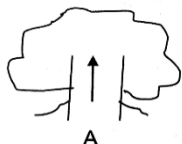
7. According to the dental formula _____ kind of teeth is absent in rabbit. [PTA – 1]
 a) molar b) per-molar c) incisor d) canine
8. The blood sucking habit of leech is known as _____. [PTA – 5]
 a) sanguivorous b) herbivorous c) omnivorous d) carnivorous

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

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 _____ [AUG – 2022]
 - a) carbon dioxide
 - b) oxygen
 - c) water
 - d) none of the above
4. Root hairs are _____ [PTA – 4]
 - a) cortical cell
 - b) projection of epidermal cell
 - c) unicellular
 - d) both b and c
5. Which of the following process requires energy? [PTA – 3]
 - 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
7. Which is the correct sequence of blood flow
 - a) ventricle → atrium → vein → arteries
 - b) atrium → ventricle → veins → arteries
 - c) atrium → ventricle → arteries → vein
 - d) ventricles → vein → atrium → arteries
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? [JUN – 2023, MDL – 19]
 - 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

Additional Questions

11. The heart of amphibians possess _____ chambers. [APR – 2023]
 - a) 3
 - b) 4
 - c) 2
 - d) 5
12. The heart of fishes possess _____ chambers. [AUG - 2022, MAY-2022]
 - a) 3
 - b) 4
 - c) 2
 - d) 5
13. The concept of blood group is derived by _____. [SEP - 2021]
 - a) Wiener
 - b) Karl Landsteiner
 - c) William Harvey
 - d) His
14. Identify the conducting tissues by using the arrow marks, [PTA – 2]



- a) A is phloem, B is xylem
- b) A is xylem, B is phloem
- c) Both A and B are xylem
- d) Both A and B are phloem

15. Structure in roots that help to absorb water is _____. [PTA – 6]
 - a) root hair
 - b) cuticle
 - c) phloem
 - d) root cap
16. Who is regarded as the “Father of Modern Physiology”? [SEP – 2020]
 - a) His-Atrio
 - b) William Harvey
 - c) Karl Landsteiner
 - d) Edward C. Kendal

15. NERVOUS SYSTEM

1. Bipolar neurons are found in [APR – 2023]
 a) **retina of eye** b) cerebral cortex c) embryo d) respiratory epithelium
 2. Site for processing of vision, hearing, memory, speech, intelligence and thought is
 a) kidney b) ear **c) brain** d) lungs
 3. In reflex action, the reflex arc is formed by
 a) brain, spinal cord, muscle b) receptor, muscle, spinal cord
 c) muscle, receptor, brain **d) receptor, spinal cord, muscle**
 4. 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
 5. The outer most of the three cranial meninges is
 a) arachnoid membrane b) pia mater **c) duramater** d) myelin sheath
 6. There are _____ pairs of cranial nerves and _____ pairs of spinal nerves. [JUN – 2023]
 a) **12, 31** b) 31, 12 c) 12, 13 d) 12, 21
 7. The neurons which carries impulse from the central nervous system to the muscle fibre.
 a) afferent neurons b) association neuron **c) efferent neuron** d) unipolar neuron
 8. Which nervous band connects the two cerebral hemispheres of brain? [PTA – 5]
 a) thalamus b) hypothalamus **c) corpus callosum** d) pons
 9. Node of Ranvier is found in [SEP – 2020]
 a) muscles **b) axons** c) dendrites d) cyton
 10. Vomiting centre is located in
 a) **medulla oblongata** b) stomach c) cerebrum d) hypothalamus
 11. Nerve cells do not possess
 a) neurilemma **b) sarcolemma** c) axon d) dendrites
 12. A person who met with an accident lost control of body temperature, water balance and hunger.
 Which of the following part of brain is supposed to be damaged?
 a) Medulla oblongata b) cerebrum c) pons **d) hypothalamus**
- Additional Question**
13. The part of human brain which acts as relay centre is _____ [PTA – 1]
 a) pons **b) thalamus** c) cerebrum d) cerebellum

16. PLANT AND ANIMAL HORMONES

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: [AUG – 2022]
 a) **2, 4-D** b) GA 3 c) Gibberellin d) IAA
4. Avena coleoptile test was conducted by
 a) Darwin b) N. Smit c) Paal **d) F.W. Went**
5. LH is secreted by
 a) Adrenal gland b) Thyroid gland **c) Anterior pituitary** d) Hypothalamus
6. Identify the exocrine gland [AUG – 2022]
 a) Pituitary gland b) Adrenal gland **c) Salivary gland** d) Thyroid gland
7. Which organ acts as both exocrine gland as well as endocrine gland
 a) **Pancreas** b) Kidney c) Liver d) Lungs
8. Which one is referred as “Master Gland”? [JUN – 2023, MAY - 2022, PTA – 2]
 a) Pineal gland **b) Pituitary gland** c) Thyroid gland d) Adrenal gland

Additional Questions

9. Pancreas acts as _____ gland. [PTA – 3]
 a) exocrine b) endocrine c) both a and b d) flying
10. _____ is found abundantly in liquid endosperm of coconut. [SEP – 2020]
 a) Auxin b) Cytokinin c) Gibberellins d) Ethylene
11. In the islets of Langerhans, beta cells secrete _____. [PTA – 6]
 a) Glucagon b) Insulin c) Thymosin d) Oxytocin

17. REPRODUCTION IN PLANTS AND ANIMALS

1. The plant which propagates with the help of its leaves is _____.
 a) Onion b) Neem c) Ginger d) Bryophyllum
2. Asexual reproduction takes place through budding in _____.
 a) Amoeba b) Yeast c) Plasmodium d) Bacteria
3. Syngamy results in the formation of _____. [APR – 2023, SEP – 2021]
 a) Zoospores b) Conidia c) Zygote d) Chlamydospores
4. The essential parts of a flower are _____.
 a) Calyx and Corolla b) Calyx and Androecium
 c) Corolla and Gynoecium d) Androecium and Gynoecium
5. Anemophilous flowers have _____.
 a) Sessile stigma b) Small smooth stigma
 c) Colored flower d) Large feathery stigma
6. Male gametes in angiosperms are formed by the division of _____. [MAY - 2022]
 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 [SEP – 2021]
 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
11. Which one of the following is an IUCD?
 a) Copper – T b) Oral pills c) Diaphragm d) Tubectomy

Additional Questions

12. _____ type of cell division occurs in generative cell of mature pollen grain [PTA – 1]
 a) Mitosis b) Meiosis c) Amitosis d) both b and c
13. In humans, a male and a female gamete fuse and form the zygote. The condition of zygote is _____. [PTA – 4]
 a) haploid b) diploid c) triploid d) tetraploid

18. GENETICS

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 [APR – 2023]
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
4. The centromere is found at the centre of the _____ chromosome.
a) Telocentric **b) Metacentric** c) Sub-metacentric d) Acrocentric
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
8. The loss of one or more chromosome in a ploidy is called _____.
a) Tetraploidy **b) Aneuploidy** c) Euploidy d) polyploidy

Additional Questions

9. The term chromosome was first coined by [MAY-2022]
a) Mendel **b) Waldeyer** c) Reginald punnet d) T.H.Morgan
10. The formation of nucleolus in the nucleus is by [PTA – 2]
a) secondary constriction b) primary constriction c) telomere d) locus
11. Identify Dihybrid Phenotypic ratio [PTA – 3]
a) 9 : 3 : 3 : 1 b) 9 : 1 : 3 : 1 c) 9 : 1 : 3 : 3 d) 1 : 2 : 1
12. In metacentric chromosome, the position of centromere is [PTA – 5]
a) the proximal end b) distal end **c) the centre** d) near the end
13. Find the correct pair. [SEP – 2020]

a) Acrocentric	- The centromere is found near the centre of the chromosome with two unequal arms.
b) Submetacentric	- The centromere is found on the proximal end.
c) Metacentric	- The centromere occurs in the centre of the chromosome and forms two equal arms.
d) Telocentric	- The centromere is found at one end with a short arm and a long arm.

19. ORIGIN AND EVOLUTION OF LIFE

1. Biogenetic law states that _____. [QR]
a) Ontogeny and phylogeny go together **b) Ontogeny recapitulates phylogeny**
c) Phylogeny recapitulates ontogeny d) There is no relationship between phylogeny & ontogeny
2. The 'use and disuse theory' was proposed by _____.
a) Charles Darwin b) Ernst Haeckel **c) Jean Baptiste Lamarck** d) Gregor Mendel
3. Paleontologists deal with a) Embryological evidences **b) Fossil evidences**
c) Vestigial organ evidences d) All the above
4. The best way of direct dating fossils of recent origin is by [PTA – 1]
a) Radio-carbon method b) Uranium lead method
c) Potassium-argon method d) Both (a) and (c)
5. The term Ethnobotany was coined by [APR – 2023, MAY-2022]
a) Khorana **b) J.W. Harshberger** c) Ronald Ross d) Hugo de Vries

Additional Questions

6. Life originates from pre-existing life was showed by: [SEP – 2021]
 a) **Louis Pasteur** b) Oparin c) Haldane d) Lamarck
7. The organism considered to be the fossil bird is _____. [PTA – 4]
 a) Ginko biloba b) **Archaeopteryx** c) Paleozoic fern d) Indian Gondwana
8. The theory of natural selection for evolution was proposed by _____. [PTA – 6]
 a) Harshberger b) Libby c) Lamarck d) **Charles Darwin**

20. BREEDING AND BIOTECHNOLOGY

1. Which method of crop improvement can be practiced by a farmer if he is inexperienced?
 a) clonal selection b) **mass selection** c) pureline selection d) hybridisation
2. Pusa Komal is a disease resistant variety of _____. [SEP – 2021]
 a) sugarcane b) rice c) **cowpea** d) maize
3. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of _____. [MAY - 2022]
 a) chilli b) maize c) sugarcane d) **wheat**
4. The miracle rice which saved millions of lives and celebrated its 50th birthday is _____.
 a) **IR 8** b) IR 24 c) atomita 2 d) ponni
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)**
6. We can cut the DNA with the help of [SEP – 2020, PTA – 2]
 a) scissors b) **restriction endonucleases** c) knife d) RNAase
7. rDNA is a a) vector DNA b) circular DNA
 c) **recombinant of vector DNA and desired DNA** d) satellite DNA
8. DNA fingerprinting is based on the principle of identifying _____ sequences of DNA. [PTA – 5]
 a) single stranded b) mutated c) polymorphic d) **repetitive**
9. 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**
10. In a hexaploid wheat ($2n = 6x = 42$) 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 $x = 7$**

Additional Question

11. _____ is a rice variety produced by mutation breeding that grows well in saline soil. [SEP – 2021]
 a) Sharbati Sonora b) **Atomita 2** c) Pusa Gaurav d) Himgiri

21. HEALTH AND DISEASES

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 [JUN – 2023, AUG – 2022, PTA – 1]
 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 [MDL – 19]
 a) Loss of memory b) **Cirrhosis of liver** c) State of hallucination d) Suppression of brain function

6. Coronary heart disease is due to
 a) *Streptococci* bacteria b) Inflammation of pericardium
 c) Weakening of heart valves d) **Insufficient blood supply to heart muscles**
7. Cancer of the epithelial cells is called [PTA - 6]
 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
9. Polyphagia is a condition seen in
 a) Obesity b) **Diabetes mellitus** c) Diabetes insipidus d) AIDs
10. Where does alcohol effect immediately after drinking?
 a) Eyes b) Auditory region c) Liver d) **Central Nervous System**

Additional Question

11. Select the odd one from the following about Diabetes mellitus. [PTA - 3]
 a) Prevalence 10% - 20% b) Juvenile onset c) Underweight d) **Obese**
12. Blood cancer is called _____ [PTA - 4]
 a) **Leukemia** b) Sarcoma c) Carcinoma d) Lipoma
13. Match the following [APR - 23]

1. Sarcoma	- i) Excessive hunger	a) (1) - (iii), (2) - (iv) (3) - (ii), (4) - (i)
2. Carcinoma	- ii) Excessive thirst	b) (1) - (iv), (2) - (iii) (3) - (i), (4) - (ii)
3. Polydipsia	- iii) connective tissue cancer	c) (1) - (i), (2) - (iii) (3) - (iv), (4) - (ii)
4. polyphagia	- iv) Stomach cancer	d) (1) - (iv), (2) - (i) (3) - (ii), (4) - (iii)

22. ENVIRONMENTAL MANAGEMENT

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 [JUN - 23, AUG - 22, PTA - 5]
2. What are the steps will you adopt for better waste management?
 a) reduce the amount of waste formed b) reuse the waste c) recycle the waste d) **all of the above**
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**
4. Soil erosion can be prevented by
 a) deforestation b) **afforestation** c) over growing d) removal of vegetation
5. A renewable source of energy is
 a) petroleum b) coal c) nuclear fuel d) **trees**
6. Soil erosion is more where there is
 a) no rain fall b) low rainfall c) **rain fall is high** d) none of these
7. An inexhaustible resources is
 a) **wind power** b) soil fertility c) wild life d) all of the above
8. Common energy source in village is
 a) electricity b) coal c) bio gas 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 [PTA – 2]
 a) hydropower b) solar energy c) **wind energy** d) thermal energy
Note: hydropower and solar energy can also be the answer
11. Global warming will cause ____
 a) raise in level of oceans b) melting of glaciers
 c) sinking of islands d) **all of these**
12. Which of the following statement is wrong with respect to wind energy
 a) Wind energy is a renewable energy
 b) **The blades of wind mill are operated with the help of electric motor**
 c) Production of wind energy is pollution free
 d) Usage of wind energy can reduce the consumption of fossil fuels

Additional Questions

13. Match the following. [MAY – 2022]
 1. Solar Energy - (i) Flowing water
 2. Petroleum - (ii) Mobile phone
 3. Hydropower - (iii) Inexhaustible energy
 4. Electric device - (iv) Exhaustible energy
 a) 1-iv, 2-iii, 3-ii, 4-i b) **1-iii, 2-iv, 3-i, 4-ii** c) 1-iii, 2-i, 3-iv, 4-ii d) 1-i, 2-iv, 3-ii, 4-iii
14. Match the following. [SEP – 2020]
 1. Polyvinyl chloride - (i) Affects brain development in children
 2. Cadmium - (ii) Affects the growth of reproductive system
 3. Lead - (iii) Brain and respiratory system
 4. Chromium - (iv) Neural damage
 5. Mercury - (v) Asthmatic bronchitis
 a) 1-v, 2-iii, 3-iv, 4-ii, 5-i b) 1-ii, 2-i, 3-v, 4-iv, 5-iii
 c) 1-iii, 2-ii, 3-iv, 4-i, 5-v d) **1-ii, 2-iv, 3-i, 4-v, 5-iii**
15. Soft finely stratified sedimentary rock refers to [MDL – 19]
 a) **shale** b) petroleum c) methane d) coal
16. The energy obtained from the movement of water due to ocean tides is _____. [PTA – 6]
 a) **tidal energy** b) wind energy c) solar energy d) water energy

23. VISUAL COMMUNICATION

1. Which software is used to create animation? a) Paint b) PDF c) MS Word d) **Scratch** [PTA-3]
 2. All files are stored in the _____. a) **Folder** b) box c) Pai d) scanner [MDL-19]
 3. Which is used to build scripts? a) **Script area** b) Block palette c) stage d) sprite [PTA – 1]
 4. Which is used to edit programs? a) Inkscape b) **script editor** c) stage d) sprite [PTA – 2]
 5. Where you will create category of blocks? a) Block palette b) **Block menu** c) Script area d) Sprite

Additional Questions

6. In computer, _____ is used to collect the notes. [PTA – 4]
 a) **notepad** b) paint c) scanner d) scratch
7. More people are using _____ and _____ operating systems in their computers. [PTA – 5]
 a) Mac, Amiga b) Solaris, iOS c) **Windows, LINUX** d) Android, Minix 3
8. The application in a computer created any output is generally referred as _____. [PTA – 6]
 a) command b) folder c) **file** d) paint

Fill in the blanks for all units**1. LAWS OF MOTION**

1. To produce a displacement force is required.
2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by inertia of motion.
3. By convention, the clockwise moments are taken as negative and the anticlockwise moments are taken as positive.
4. Gears is used to change the speed of car.
5. A man of mass 100 kg has a weight of 980 N at the surface of the Earth.

2. OPTICS

1. The path of the light is called as ray of light.
2. The refractive index of a transparent medium is always greater than one.
3. If the energy of incident beam and the scattered beam are same, then the scattering of light is called as elastic scattering.
4. According to Rayleigh's scattering law, the amount of scattering of light is inversely proportional to the fourth power of its wavelength.
5. Amount of light entering into the eye is controlled by iris.

3. THERMAL PHYSICS

1. The value of Avogadro number $6.023 \times 10^{23} / \text{mole}$. [SEP – 2020]
2. The temperature and heat are scalar quantities. [PTA – 2]
3. One calorie is the amount of heat energy required to raise the temperature of 1 g of water through 1°C.
4. According to Boyle's law, the shape of the graph between pressure and reciprocal of volume is straight line.

Additional Question

5. Temperature is the average kinetic energy of the molecules of a substance. [PTA – 2]

4. ELECTRICITY

1. When a circuit is open, current cannot pass through it.
2. The ratio of the potential difference to the current is known as resistance.
3. The wiring in a house consists of parallel circuits.
4. The power of an electric device is a product of current and potential difference.
5. LED stands for Light Emitting Diode.

5. ACOUSTICS

1. Rapid back and forth motion of a particle about its mean position is called vibration.
2. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in both south and north.
3. A whistle giving out a sound of frequency 450 Hz, approaches a stationary observer at a speed of 33 ms^{-1} . The frequency heard by the observer is (speed of sound = 330 ms^{-1}) 500 Hz.
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 2067.8 Hz.

6. NUCLEAR PHYSICS

- One roentgen is equal to $2.58 \times 10^{-4} \text{ C / Kg}$ disintegrations per second.
- Positron is an **elementary particle (or) anti electron**.
- Anemia can be cured by **Radio-iron (Fe^{59})** isotope.
- Abbreviation of ICRP - **International Commission on Radiological Protection**.
- Dosimeter** is used to measure exposure rate of radiation in humans.
- Gamma ray** has the greatest penetration power.
- ${}_Z\text{Y}^A \rightarrow {}_{Z+1}\text{Y}^A + \text{X}$; Then, X is **Beta ray** (${}_{-1}e^0$).
- ${}_Z\text{X}^A \rightarrow {}_Z\text{Y}^A$ This reaction is possible in **gamma** decay.
- The average energy released in each fusion reaction is about $3.84 \times 10^{-12} \text{ J}$.
- Nuclear fusion is possible only at an extremely high temperature of the order of **$10^7 \text{ K to } 10^9 \text{ K}$** .
- The radio isotope of **phosphorous (P-32)** helps to increase the productivity of crops.
- If the radiation exposure is 100 R, it may cause **leukemia (or) cancer**. [JUN – 2023]

7. ATOMS AND MOLECULES

- Atoms of different elements having **same** mass number, but **different** atomic numbers are called isobars.
- Atoms of one element can be transmuted into atoms of other element by **artificial transmutation**.
- The sum of the numbers of protons and neutrons of an atom is called its **mass number**.
- Relative atomic mass is otherwise known as **standard atomic weight**.
- The average atomic mass of hydrogen is **1.008** amu.
- If a molecule is made of similar kind of atoms, then it is called **homo** atomic molecule.
- The number of atoms present in a molecule is called its **atomicity**. [PTA – 4]
- One mole of any gas occupies **22400** ml at S.T.P.
- Atomicity of phosphorous is **4**.

Additional Question

- Atoms of different elements having same number of **neutrons** are called isotones. [PTA – 4]

8. PERIODIC CLASSIFICATION OF ELEMENTS

- If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of bonding is **ionic**. [PTA – 5]
- Sixth period** is the longest period in the periodical table.
- Atomic number** forms the basis of modern periodic table.
- If the distance between two Cl atoms in Cl_2 molecule is $1.98 \text{ \AA}$, then the radius of Cl atom is **$0.99 \text{ \AA}$** .
- Among the given species A^- , A^+ , and A, the smallest one in size is **A^+** .
- The scientist who propounded the modern periodic law is **Henry Moseley**.
- Across the period, ionic radii **decreases**. (increases, decreases).
- Lanthanides** and **actinides** are called inner transition elements.
- The chief ore of Aluminium is **bauxite**.
- The chemical name of rust is **hydrated ferric oxide ($\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$)**.

9. SOLUTIONS

- The component present in lesser amount, in a solution is called **solute**. [MDL – 19]
- Example for liquid in solid type solution is **mercury with sodium (amalgam)**.
- Solubility is the amount of solute dissolved in **100 g** of solvent.
- Polar compounds are soluble in **polar** solvents.
- Volume percentage decreases with increase in temperature because of **thermal expansion of liquid**.

10. TYPES OF CHEMICAL REACTIONS

1. A reaction between an acid and a base is called neutralization reaction.
2. When lithium metal is placed in hydrochloric acid, hydrogen gas is evolved.
3. The equilibrium attained during the melting of ice is known as physical equilibrium.
4. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH increases (increase/decrease).
5. The value of ionic product of water at 25°C is $1.00 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-6}$.
6. The normal pH of human blood is 7.4.
7. Electrolysis is a type of decomposition reaction.
8. The number of products formed in a synthesis reaction is one.
9. Chemical volcano is an example for decomposition type of reaction.
10. The ion formed by dissolution of H^+ in water is called hydronium ion (or) H_3O^+ ion.

11. CARBON AND ITS COMPOUNDS

1. An atom or a group of atoms, which is responsible for chemical characteristics of an organic compound is called functional group.
2. The general molecular formula of alkynes is $\text{C}_n\text{H}_{2n-2}$.
3. In IUPAC name, the carbon skeleton of a compound is represented by root word (root word/prefix/suffix).
4. (Saturated / Unsaturated) Unsaturated compounds decolourize bromine water.
5. Dehydration of ethanol by conc. sulphuric acid forms ethene. (ethene/ ethane)
6. 100 % pure ethanol is called absolute alcohol.
7. Ethanoic acid turns blue litmus to red.
8. The alkaline hydrolysis of fatty acids is termed as saponification.
9. Biodegradable detergents are made of straight (branched / straight) chain hydrocarbons.

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

1. The innermost layer of cortex in root is called endodermis.
2. Xylem and phloem are arranged in an alternate radii constitute a vascular bundle called radial bundles.
3. Glycolysis takes place in cytoplasm.
4. The source of O_2 liberated in photosynthesis is water.
5. Mitochondria is ATP factory of the cells.

13. STRUCTURAL ORGANISATION OF ANIMALS

1. The posterior sucker is formed by the fusion of the last seven segments.
2. The existence of two sets of teeth in the life of an animal is called diphyodont dentition.
3. The anterior end of leech has a lobe-like structure called anterior sucker.
4. The blood sucking habit of leech is known as sanguivorous. [PTA – 5]
5. Kidney separate nitrogenous waste from the blood in rabbit.
6. 37 pairs spinal nerves are present in rabbit.

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

1. Transpiration involves evaporative loss of water from aerial parts.
2. Water enters into the root hair cell through plasma (or) semi permeable membrane.
3. Parts of the root (or) structures in root that absorbs water from the soil is root hair. [PTA – 6]
4. Normal blood pressure is 120 mm Hg / 80 mm Hg.
5. The normal human heartbeat rate is about 72 – 75 time per minute.

Additional Question

6. William Harvey is the father of modern physiology.

[SEP – 2020]

15. NERVOUS SYSTEM

1. **Neurons** is the longest cell in our body.
2. Impulses travels rapidly in **myelinated multipolar** neurons.
3. A change in the environment that causes an animal to react is called **stimulus**.
4. **Dendrites** carries the impulse towards the cell body.
5. The two antagonistic component of autonomic nervous system are **sympathetic** and **parasympathetic**.
6. A neuron contains all cell organelles except **centrioles**.
7. **Cerebrospinal fluid** maintains the constant pressure inside the cranium.
8. **Gyri** and **sulci** increases the surface area of cerebrum.
9. The part of human brain, which acts as relay centre is **thalamus**. [PTA – 1]

16. PLANT AND ANIMAL HORMONES

1. **Auxins** causes cell elongation, apical dominance and prevents abscission.
2. **Ethylene** is a gaseous hormone involved in abscission of organs and acceleration of fruit ripening.
3. **Abscisic acid** causes stomatal closure.
4. Gibberellins induce stem elongation in **rosette** plants.
5. The hormone which has negative effect on apical dominance is **cytokinin**.
6. Calcium metabolism of the body is controlled by **parathormone**.
7. In the islets of Langerhans, beta cells secrete **insulin**. [PTA – 6]
8. The growth and functions of thyroid gland is controlled by **thyroid stimulating hormone**.
9. Decreased secretion of thyroid hormones in the children leads to **cretinism**.

17. REPRODUCTION IN PLANTS AND ANIMALS

1. The embryo sac in a typical dicot at the time of fertilization is **seven cells and eighth nuclei**.
2. After fertilization the ovary develops into **fruit**.
3. *Planaria* reproduces asexually by **regeneration**.
4. Fertilization is **internal** in humans.
5. The implantation of the embryo occurs at about **6th to 7th** day of fertilization.
6. **Colostrum** is the first secretion from the mammary gland after childbirth.
7. Prolactin is a hormone produced by **anterior pituitary gland**.

18. GENETICS

1. The pairs of contrasting character (traits) of Mendel are called **alleles (or) allelomorphs**.
2. Physical expression of a gene is called **phenotype**.
3. The thin thread like structures found in the nucleus of each cell are called **chromosomes**.
4. DNA consists of two **polynucleotide** chains.
5. An inheritable change in the amount or the structure of a gene or a chromosome is called **mutation**.

Additional Questions

6. In DNA replication, the enzyme that separates the two strands of DNA is **helicase**. [PTA – 1]
7. Enzyme that removes the twists formed during the unwinding process of DNA is **topoisomerase**. [PTA – 1]
8. Nucleotides are added with the help of an enzyme called **DNA Polymerase**. [PTA – 1]
9. The DNA fragments are joined together by the enzyme **DNA ligases**. [PTA – 1]
10. The replication stops when the replication fork of the two sides meet at a site called **terminus**. [PTA-1]

19. ORIGIN AND EVOLUTION OF LIFE

1. The characters developed by the animals during their life time, in response to the environmental changes are called acquired characters (adaptations).
2. The degenerated and non-functional organs found in an organism are called vestigial organs.
3. The forelimbs of bat and human are examples of homologous organs. [QR]
4. The theory of natural selection for evolution was proposed by Charles Darwin. [PTA – 6]

20. BREEDING AND BIOTECHNOLOGY

1. Economically important crop plants with superior quality are raised by plant breeding.
2. A protein rich wheat variety is atlas 66.
3. Colchicine is the chemical used for doubling the chromosomes.
4. The scientific process which produces crop plants enriched with desirable nutrients is called biofortification.
5. Rice normally grows well in alluvial soil, but atomita 2 is a rice variety produced by mutation breeding that grows well in saline soil. [SEP – 2021]
6. Genetic engineering (or) recombinant DNA technique made it possible to genetically engineer living organism.
7. Restriction endonucleases cut the DNA molecule at specific positions known as restriction sites.
8. Similar DNA fingerprinting is obtained for identical twins.
9. Stem cells are undifferentiated mass of cells.
10. In gene cloning the DNA of interest is integrated in a suitable vector (Plasmid).

21. HEALTH AND DISEASES

1. Cirrhosis is caused in liver due to excessive use of alcohol.
2. A highly poisonous chemicals derived from tobacco is nicotine.
3. Blood cancer is called leukaemia. [PTA – 4]
4. Less response of a drug to a specific dose with repeated use is called drug tolerance.
5. Insulin resistance is a condition in non – insulin dependent (or) Type – 2 diabetes mellitus.

22. ENVIRONMENTAL MANAGEMENT

1. Deforestation leads to decrease in rainfall.
2. Removal of soil particles from the land is called soil erosion.
3. Chipko movement is initiated against the cutting down of trees (deforestation).
4. The Nilgiris is a biosphere reserve in Tamilnadu.
5. Tidal energy is non-conventional (or) renewable type of energy.
6. Coal, petroleum and natural gas are called fossil fuels.
7. Coal is the most commonly used fuel for the production of electricity.

Assertion and Reason for all units

1. LAWS OF MOTION

Mark the correct choice as

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

1. **Assertion:** The sum of the clockwise moments is equal to the sum of the anticlockwise moments.

Reason : The principle of conservation of momentum is valid if the external force on the system is zero.

Ans. (b) *Both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.*

2. **Assertion:** The value of 'g' decreases as height and depth increases from the surface of the Earth.

Reason : 'g' depends on the mass of the object and the Earth.

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

Additional Question

3. **Assertion :** When a person swims he pushes the water using the hands backwards and the water pushes the person in the forward direction [PTA-3]

Reason : For every action there is an equal and opposite reaction.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

2. OPTICS

Mark the correct choice as

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

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.

Ans. (a) *Both assertion and reason are true and reason is the correct explanation of assertion.*

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.

Ans. (a) *Both assertion and reason are true and reason is the correct explanation of assertion.*

3. THERMAL PHYSICS

Mark the correct choice as

- (a) Both the assertion and the reason are true and the reason is the correct explanation of 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:** If one end of the rod is heated, other end also is heated.

Reason : Heat always flows from a region of lower temperature to higher temperature of the rod.

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

Corrected statement: Heat always flows from a region of **higher** temperature to **lower** temperature of the rod.

2. **Assertion:** Gas is highly compressible than solid and liquid. [PTA – 2]

Reason : Interatomic or intermolecular distance in the gas is comparably high.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of assertion.*

Additional Question

3. **Assertion:** Heat always flows from the body of higher temperature to the body of lower temperature.

Reason : The mass of the body is not altered when it is heated or cooled. [PTA – 5]

Ans. (b) *Both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.*

4. ELECTRICITY

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.

1. **Assertion:** Electric appliances with a metallic body have three wire connections.

Reason : Three pin connections reduce heating of the connecting wires.

Ans. (c) *The assertion is true, but the reason is false.*

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.

Ans. (c) *The assertion is true, but the reason is false.*

3. **Assertion:** LED bulbs are far better than incandescent bulbs.

Reason : LED bulbs consume less power than incandescent bulbs.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

5. ACOUSTICS

Mark the correct choice as

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

1. Assertion : The change in air pressure affects the speed of sound.

Reason : The speed of sound in a gas is proportional to the square of the pressure.

Both assertion and reason are False. **No option suits the answer.**

Hint: The change in air pressure **does not affect** the speed of sound.

2. Assertion : Sound travels faster in solids than in gases.

Reason : Solid possess a greater density than that of gases.

Ans. (b) *Both the assertion and the reason are true, but the reason is not the correct explanation of the Assertion.*

6. NUCLEAR PHYSICS

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.

1. Assertion: A neutron impinging on U^{235} , splits it to produce Barium and Krypton.

Reason : U - 235 is a fissile material.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

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

Reason : In β - decay atomic number increases by one.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

3. Assertion : Extreme temperature is necessary to execute nuclear fusion.

Reason : In a nuclear fusion, the nuclei of the reactants combine releasing high energy.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

4. Assertion : Control rods are known as 'neutron seeking rods'.

Reason : Control rods are used to perform sustained nuclear fission reaction.

Ans. (a) *Both the assertion and the reason are true and the reason is the correct explanation of the assertion.*

7. ATOMS AND MOLECULES

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 explain A.

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

Reason : An atom of aluminium is 27 times heavier than $\frac{1}{12}$ th of the mass of the C – 12 atom.

Ans. (iv) *A and R are correct, R does not explain A.*

2. **Assertion:** The Relative Molecular Mass of Chlorine is 35.5 a.m.u.

[PTA – 3]

Reason : The natural abundance of Chlorine isotopes are not equal.

Ans. (iii) *A is wrong, R is correct.*

8. PERIODIC CLASSIFICATION OF ELEMENTS

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 explain A.

1. **Assertion (A) :** The nature of bond in HF molecule is ionic.

[PTA – 2]

Reason (R) : The electronegativity difference between H and F is 1.9.

Ans. (i) *A and R are correct, R explains the A.*

2. **Assertion (A) :** Magnesium is used to protect steel from rusting.

Reason (R) : Magnesium is more reactive than iron.

Ans. (i) *A and R are correct, R explains the A.*

3. **Assertion (A) :** An uncleaned copper vessel is covered with greenish layer.

[PTA – 5]

Reason (R) : copper is not attacked by alkali.

Ans. (iv) *A and R are correct, R doesn't explain A.*

11. CARBON AND ITS COMPOUNDS

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 explain A.

1. **Assertion (A):** Detergents are more effective cleansing agents than soaps in hard water. [PTA – 4]

Reason (R) : Calcium and magnesium salts of detergents are water soluble.

Ans. (i) *A and R are correct, R explains the A.*

2. **Assertion (A) :** Alkanes are saturated hydrocarbons.

Reason (R) : Hydrocarbons consist of covalent bonds.

Ans. (iv) *A and R are correct, R doesn't explain A.*

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

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 (A):** RBC plays an important role in the transport of respiratory gases.

Reason (R) : RBC do not have cell organelles and nucleus.

Ans. (a) *Both A and R are true and R is correct explanation of A.*

2. **Assertion (A) :** Persons with AB blood group are called an universal recipients, because they can receive blood from all groups.

Reason (R) : Antibodies are absent in persons with AB blood group.

Ans. (a) *Both A and R are true and R is correct explanation of A.*

15. NERVOUS SYSTEM

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 are correct
- (d) Both assertion and reason are wrong.

1. **Assertion :** Cerebrospinal fluid is present throughout the central nervous system.

Reason : Cerebrospinal fluid has no such functions.

Ans. (a) *Assertion is correct and reason is wrong.*

2. **Assertion :** Corpus callosum is present in space between the duramater and piamater.

Reason : It serves to maintain the constant intracranial pressure.

Ans. (d) *Both assertion and reason are wrong.*

16. PLANT AND ANIMAL HORMONES

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 (A):** Application of cytokinin to marketed vegetables can keep them fresh for several days.

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

Ans. (a) *Both A and R are true but R is correct explanation of A.*

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

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

Ans. (a) *Both A and R are true and R is correct explanation of A.*

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

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

Ans. (b) *Both A and R are true but R is not the correct explanation of A.*

20. BREEDING AND BIOTECHNOLOGY

- 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.

Ans. (a) *Assertion is correct and reason is wrong.*

2. **Assertion** : Colchicine reduces the chromosome number.

[PTA – 3]

Reason : It promotes the movement of sister chromatids to the opposite poles.

Ans. (d) *Both assertion and reason is wrong.*

3. **Assertion** : rDNA is superior over hybridisation techniques.

[PTA – 4]

Reason : Desired genes are inserted without introducing the undesirable genes in target organisms.

Ans. (c) *Both assertion and reason is correct.*

21. HEALTH AND DISEASES

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 Assertion
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.

Ans (a) *Both Assertion and Reason are true and Reason is the correct explanation of Assertion.*

2. **Assertion** : Excretion of excess glucose in urine is observed in a person with diabetes mellitus.

Reason : Pancreas is unable to produce sufficient quantity of insulin.

Ans (a) *Both Assertion and Reason are true and Reason is the correct explanation of Assertion.*

22. ENVIRONMENTAL MANAGEMENT

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 rainwater.

Reason : Rainwater can be directed to recharge the underground water source.

Ans. (a) *Both assertion and reason are true and reason is correct explanation of assertion.*

Match the Following for all units

1. LAWS OF MOTION

Column I	Column II	Answer[PTA-1]
a) Newton's I law	Propulsion of a rocket	a) Stable equilibrium of a body
b) Newton's II law	Stable equilibrium of a body	b) Law of force
c) Newton's III law	Law of force	c) Flying nature of bird
d) Law of conservation of Linear momentum	Flying nature of bird	d) Propulsion of a rocket

2. OPTICS

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

3. THERMAL PHYSICS

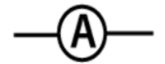
Column I	Column II	Answer
1. Linear expansion	(a) change in volume	1-d) change in length
2. Superficial expansion	(b) hot body to cold body	2-e) change in area
3. Cubical expansion	(c) $1.381 \times 10^{-23} \text{ JK}^{-1}$	3-a) change in volume
4. Heat transformation	(d) change in length	4-b) hot body to cold body
5. Boltzmann constant	(e) change in area	5-c) $1.381 \times 10^{-23} \text{ JK}^{-1}$

4. ELECTRICITY

Column I	Column II	Answer
(i) Electric current	(a) volt	i - (e) ampere
(ii) Potential difference	(b) ohm metre	ii - (a) volt
(iii) Specific resistance	(c) watt	iii - (b) ohm metre
(iv) Electrical power	(d) joule	iv - (c) watt
(v) Electrical energy	(e) ampere	v - (d) joule

Additional Question

[PTA – 2]

Column I	Column II	Answer
(a) Ammeter	(i) 	a - (iii)
(b) Diode	(ii) 	b - (i)
(c) Galvanometer	(iii) 	c - (iv)
(d) Resistor	(iv) 	d - (ii)

5. ACOUSTICS

Column I	Column II	Answer
1) Infrasonic	a) Compressions	1-c) 10 Hz 2-d) Ultrasonography 3-b) 22 kHz 4-a) Compressions
2) Echo	b) 22 kHz	
3) Ultrasonic	c) 10 Hz	
4) High pressure region	d) Ultrasonography	

6. NUCLEAR PHYSICS

Match : I

Column I	Column II	Answer
1. BARC	Kalpakkam	1. Mumbai 2. Tarapur 3. Kalpakkam 4. Apsara
2. India's first atomic power station	Apsara	
3. IGCAR	Mumbai	
4. First nuclear reactor in India	Tarapur	

Match: II

Column I	Column II	Answer
1. Fuel [PTA – 6]	lead	1. uranium 2. heavy water 3. cadmium rods 4. lead
2. Moderator [PTA – 6]	heavy water	
3. Control rods	cadmium rods	
4. Shield [PTA – 6]	uranium	
Additional Question : 5. Coolant – Helium		[PTA – 6]

Match: III

Column I	Column II	Answer
1. Soddy & Fajan	Natural radioactivity	1. Displacement law 2. Artificial Radioactivity 3. Natural radioactivity 4. Mass energy equivalence
2. Irene Curie	Displacement law	
3. Henry Bequerel	Mass energy equivalence	
4. Albert Einstein	Artificial Radioactivity	

Match: IV

Column I	Column II	Answer
1. Uncontrolled fission reaction	Hydrogen Bomb	1. Atom bomb 2. Breeder reactor 3. Nuclear reactor 4. Hydrogen bomb
2. Fertile material	Nuclear Reactor	
3. Controlled fission reaction	Breeder reactor	
4. Fusion reaction	Atom bomb	

Match: V

Column I	Column II	Answer
1. Fe - 59	Age of fossil	1. Leukemia 2. Thyroid disease 3. Function of heart 4. Age of fossil
2. I - 131 [JUN – 2023]	Function of Heart	
3. Na – 24 [JUN – 2023]	Leukemia	
4. C – 14 [JUN – 2023]	Thyroid disease	
Additional Question : 5. Co-60 - Cancer		[JUN – 2023]

7. ATOMS AND MOLECULES

Column I	Column II	Answer	<i>Hint</i> : No. of moles = $\frac{\text{Mass}}{\text{Atomic/molecular mass}}$
1. 8g of O ₂	4 moles	1) 0.25 moles	1) 8g of O ₂ = $\frac{8}{32} = 0.25$ moles
2. 4g of H ₂	0.25 moles	2) 2 moles	2) 4g of H ₂ = $\frac{4}{2} = 2$ moles
3. 52 g of He	2 moles	3) 13 moles	3) 52 g of He = $\frac{52}{4} = 13$ moles
4. 112 g of N ₂	0.5 moles	4) 4 moles	4) 112 g of N ₂ = $\frac{112}{28} = 4$ moles
5. 35.5 g of Cl ₂	13 moles	5) 0.5 mole	5) 35.5 g of Cl ₂ = $\frac{35.5}{71} = 0.5$ moles

8. PERIODIC CLASSIFICATION OF ELEMENTS

Column I	Column II	Answer [PTA – 6]
1. Galvanisation	Noble gas elements	1. Coating with Zn
2. Calcination	Coating with Zn	2. Heating in the absence of air
3. Redox reaction	Silver - tin amalgam	3. Alumino thermic process
4. Dental filling	Alumino thermic process	4. Silver - tin amalgam
5. Group 18 elements	Heating in the absence of air	5. Noble gas elements

9. SOLUTIONS

Column I	Column II	Answer
1. Blue vitriol	CaSO ₄ .2H ₂ O	1) CuSO ₄ .5H ₂ O
2. Gypsum	CaO	2) CaSO ₄ .2H ₂ O
3. Deliquescence	CuSO ₄ .5H ₂ O	3) NaOH
4. Hygroscopic	NaOH	4) CaO

10. TYPES OF CHEMICAL REACTIONS

1. Identify the types of reaction :

[PTA – 2]

REACTION	TYPE	Answer
1) $\text{NH}_4\text{OH}_{(\text{aq})} + \text{CH}_3\text{COOH}_{(\text{aq})} \rightarrow \text{CH}_3\text{COONH}_{4(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$	a) Single Displacement	1 - c
2) $\text{Zn}_{(\text{s})} + \text{CuSO}_{4(\text{aq})} \rightarrow \text{ZnSO}_{4(\text{aq})} + \text{Cu}_{(\text{s})}$	b) Combustion	2 - a
3) $\text{ZnCO}_{3(\text{s})} \xrightarrow{\text{Heat}} \text{ZnO}_{(\text{s})} + \text{CO}_{2(\text{g})}$	c) Neutralisation	3 - d
4) $\text{C}_2\text{H}_{4(\text{g})} + 4\text{O}_{2(\text{g})} \rightarrow 2\text{CO}_{2(\text{g})} + 2\text{H}_2\text{O}_{(\text{g})} + \text{Heat}$	d) Thermal decomposition	4 - b

11. CARBON AND ITS COMPOUNDS

[PTA – 2]

Column I	Column II	Answer
1. Functional group –OH	Benzene	1. Alcohol
2. Heterocyclic	Potassium stearate	2. Furan
3. Unsaturated	Alcohol	3. Ethene
4. Soap	Furan	4. Potassium stearate
5. Carbocyclic	Ethene	5. Benzene

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

Column I	Column II	Answer
1. Amphicribal	<i>Dracaena</i>	1. Fern
2. Cambium	Translocation of food	2. Secondary growth
3. Amphivasal	Fern	3. <i>Dracaena</i>
4. Xylem	Secondary growth	4. Conduction of water
5. Phloem	Conduction of water	5. Translocation of food

13. STRUCTURAL ORGANISATION OF ANIMALS

[PTA – 2]

Organs	Membranous Covering	Location
1. Brain	<i>meninges</i>	<i>cranial cavity</i>
2. Kidney	<i>capsule</i>	<i>abdominal cavity</i>
3. Heart	<i>pericardium</i>	<i>mediastinum</i>
4. Lungs	<i>pleura</i>	<i>enclosed in thoracic cavity</i>

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

Section - I

Column I	Column II	Answer
1. Symplastic pathway	Leaf	1. Plasmodesmata
2. Transpiration	Plasmodesmata	2. Leaf
3. Osmosis	Pressure in xylem	3. Pressure gradient
4. Root Pressure	Pressure gradient	4. Pressure in xylem

Section - II

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

15. NERVOUS SYSTEM

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

16. PLANT AND ANIMAL HORMONES

A)

Column I	Column II	Column III
1. Auxin	<i>Coleoptile tip</i>	<i>Apical dominance</i>
2. Ethylene	<i>Fruits</i>	<i>Ripening</i>
3. Abscissic acid	<i>Chloroplast</i>	<i>Abscission</i>
4. Cytokinin	<i>Coconut milk</i>	<i>Cell division</i>
5. Gibberellins	<i>Gibberella fujikuroi</i>	<i>Internodal elongation</i>

B) Match the following hormones with their deficiency states

Hormones	Disorders	Answer
1. Thyroxine	Acromegaly	1. Simple goitre
2. Insulin	Tetany	2. Diabetes mellitus
3. Parathormone	Simple goitre	3. Tetany
4. Growth hormone	Diabetes insipidus	4. Acromegaly
5. ADH	Diabetes mellitus	5. Diabetes insipidus

17. REPRODUCTION IN PLANTS AND ANIMALS

A)

Column 1	Column 2	Answer
1. Fission	Spirogyra	1. Amoeba
2. Budding	Amoeba	2. Yeast
3. Fragmentation	Yeast	3. Spirogyra

B) Match the following terms with their respective meanings

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

18. GENETICS

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

19. ORIGIN AND EVOLUTION OF LIFE

Column A	Column B	Answer[PTA – 5]
1. Atavism	Caudal vertebrae and vermiform appendix	1. Rudimentary tail and thick hair on the body
2. Vestigial organs	A forelimb of a cat and a bat's wing	2. Caudal vertebrae and vermiform appendix
3. Analogous organs	Rudimentary tail and thick hair on the body	3. A wing of a bat and awing of an insect
4. Homologous organs	A wing of a bat and awing of an insect	4. A forelimb of a cat and a bat's wing
5. Wood park	Radiocarbon dating	5. Thiruvakkarai
6. W.F. Libby	Thiruvakkarai	6. Radiocarbon dating

20. BREEDING AND BIOTECHNOLOGY

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

21. HEALTH AND DISEASES

Column I	Column II	Answer
1. Sarcoma [APR – 23]	Stomach cancer	1. Connective tissue cancer
2. Carcinoma [APR – 23]	Excessive thirst	2. Stomach cancer
3. Polydipsia [APR – 23]	Excessive hunger	3. Excessive thirst
4. Polyphagia [APR – 23]	Lack of blood flow to heart muscle	4. Excessive hunger
5. Myocardial Infarction	Connective tissue cancer	5. Lack of blood flow to heart muscle

22. ENVIRONMENTAL MANAGEMENT

Column I	Column II	Answer
1. Soil erosion	Energy saving	1. Removal of vegetation
2. Bio gas	Acid rain	2. CO ₂
3. Natural gas	Removal of vegetation	3. Non - renewable energy
4. Green house gas	Renewable energy	4. Acid rain
5. CFL bulbs	CO ₂	5. Energy saving
6. Wind	Non - renewable energy	6. Renewable energy
7. Solid waste	Lead and heavy metals	7. Lead and heavy metals

23. VISUAL COMMUNICATION

Column - I	Column - II	Answer
1. Script Area	Type notes	1. Build scripts
2. Folder	Animation software	2. Store files
3. Scratch	Edit programs	3. Animation software
4. Costume editor	Store files	4. Edit programs
5. Notepad	Build Scripts	5. Type notes

True or False for all units

1. LAWS OF MOTION

1. The linear momentum of a system of particles is always conserved. [False]
The linear momentum of a system of particles is conserved, when **no external force is applied.*
2. Apparent weight of a person is always equal to his actual weight. [False]
** Apparent weight of a person is **not equal** to his actual weight.*
3. Weight of a body is greater at the equator and less at the polar region. [False]
Weight of a body is **less at the equator and **greater** at the polar region.*
4. Turning a nut with a spanner having a short handle is so easy than one with a long handle. [False]
Turning a nut with a spanner having a **long handle is so easy than one with a **short** handle.*
5. There is no gravity in the orbiting space station around the Earth. So the astronauts feel weightlessness. [False]
**Astronauts and orbiting space station are under free fall with same acceleration. So the astronauts feel weightlessness.*

2. OPTICS

1. Velocity of light is greater in denser medium than in rarer medium. [False]
Velocity of light is **lesser in denser medium than in rarer medium.*
2. The power of lens depends on the focal length of the lens. [True]
3. Increase in the converging power of eye lens cause 'hypermetropia'. [False]
Increase in the converging power of eye lens cause 'myopia**'.*
4. The convex lens always gives small virtual image. [False]
The **concave lens always gives small virtual image.*

3. THERMAL PHYSICS

1. For a given heat in liquid, the apparent expansion is more than that of real expansion. [False]
For a given heat in liquid, the apparent expansion is **less than that of real expansion.*
2. Thermal energy always flows from a system at higher temperature to a system at lower temperature. [True]
3. According to Charles's law, at constant pressure, the temperature is inversely proportional to volume. [False]
[PTA – 2]
According to Charles's law, at constant pressure, temperature of gas is **directly proportional to volume.*

Additional Question

4. During the process of transferring heat energy, the body at lower temperature is cooled while the body at higher temperature is heated. [False]
[PTA – 4]
During the process of transferring heat energy, the body at lower temperature is **heated while the body at higher temperature is **cooled**.*

4. ELECTRICITY

- Ohm's law states the relationship between power and voltage. [False]
Ohm's law states the relationship between **current and **potential difference**.*
- MCB is used to protect household electrical appliances. [True]
- The SI unit for electric current is coulomb. [False]
The SI unit for electric current is **ampere.*
- One unit of electrical energy consumed is equal to 1000 kilowatt hour. [False]
One unit of electrical energy consumed is equal to **1 kilowatt hour.*
- The effective resistance of three resistors connected in series is lesser than the lowest of the individual resistances. [False]
Effective resistance of three resistors in series is **greater than **highest** of individual resistances.*

5. ACOUSTICS

- Sound can travel through solids, gases, liquids and even vacuum. [False]
Sound can travel through solids, gases, liquids and **cannot travel through vacuum.*
- Waves created by Earth Quake are Infrasonic. [True]
- The velocity of sound is independent of temperature. [False]
The velocity of sound is **directly proportional to the square root of temperature.*
- The velocity of sound is high in gases than liquids. [False]
The velocity of sound is **low in gases than liquids.*

6. NUCLEAR PHYSICS

- Plutonium -239 is a fissionable material. [True]
- Elements having atomic number greater than 83 can undergo nuclear fusion. [False]
Elements having atomic number greater than **83 can undergo **natural radioactivity**.*
- Nuclear fusion is more dangerous than nuclear fission. [True]
- Natural uranium U-238 is the core fuel used in a nuclear reactor. [False]
Uranium **U-235 is the core fuel used in a nuclear reactor.*
- If a moderator is not present, then a nuclear reactor will behave as an atom bomb. [False]
If a **control rod is not present, then a nuclear reactor will behave as an atom bomb.*
- During one nuclear fission on an average, 2 to 3 neutrons are produced. [True]
- Einstein's theory of mass energy equivalence is used in nuclear fission and fusion. [True]

7. ATOMS AND MOLECULES

- Two elements sometimes can form more than one compound. [True]
- Noble gases are diatomic. [False]
Noble gases are **monoatomic.*
- The gram atomic mass of an element has no unit. [False]
The **relative atomic mass of an element has no unit.*
- 1 mole of Gold and Silver contain same number of atoms. [True]
- Molar mass of CO₂ is 42g. [False]
** Molar mass of CO₂ = 12 + (16 × 2) = **44 g**.*

8. PERIODIC CLASSIFICATION OF ELEMENTS

1. Moseley's periodic table is based on atomic mass. [False]
Moseley's periodic table is based on **Atomic number.*
2. Ionic radius increases across the period from left to right. [False]
Ionic radius **decreases across the period from left to right.*
3. All ores are minerals; but all minerals cannot be called as ores. [True]
4. Al wires are used as electric cables due to their silvery white colour. [False]
Al wires are used as electric cables due to their **electrical conductivity.*
5. An alloy is a heterogenous mixture of metals. [False]
An alloy is a **homogeneous mixture of metals.*

9. SOLUTIONS

1. Solutions which contain three components are called binary solution. [False]
Solutions which contain **two components are called binary solution.*
2. In a solution, the component which is present in lesser amount is called solvent. [False]
In a solution, the component which is present in lesser amount is called **solute. [PTA - 4]*
3. Sodium chloride dissolved in water forms a non - aqueous solution. [PTA - 4] [False]
Sodium chloride dissolved in water forms an **aqueous solution.*
4. The molecular formula of green vitriol is $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ [False]
The molecular formula of green vitriol is **$\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (or) The molecular formula of **epsom salt** is $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$.*
5. When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature. [True] [PTA - 4]

Additional Questions

6. In our daily life such as a solution of syrups, mouth wash, antiseptic solution, household disinfectants etc., the concentration of the ingredients is expressed as w/w. [False]
In our daily life such as a solution of syrups, mouth wash, antiseptic solution, household disinfectants etc., the concentration of the ingredients is expressed as **v/v. [SEP- 2020]*
7. In ointments, antacids, soaps, etc., concentration of solution is expressed as v/v. [False]
In ointments, antacid, soaps, etc., concentration of solution is expressed as **w/w. [SEP- 2020]*

10. TYPES OF CHEMICAL REACTIONS

1. Silver metal can displace hydrogen gas from nitric acid. [False]
** Silver metal **does not displace** hydrogen from nitric acid.*
2. The pH of rain water containing dissolved gases like SO_3 , CO_2 , NO_2 will be less than 7. [True]
3. At the equilibrium of a reversible reaction, the concentration of the reactants and the products will be equal. [True]
4. Periodical removal of one of the products of a reversible reaction increases the yield. [True]
5. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic. [False]
On dipping a pH paper in a solution, it turns into yellow. Then the solution is **acidic. (or) On dipping a pH paper in a solution, it turns into **violet**. Then the solution is basic.*

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

1. Phloem tissue is involved in the transport of water in plant. [False]
* *Xylem* tissue is involved in the transport of water in plant.
2. The waxy protective covering of a plant is called as cuticle. [True]
3. In monocot stem, cambium is present in between xylem and phloem. [False]
* In **dicot** stem, cambium is present in between xylem and phloem.
4. Palisade parenchyma cells occur below upper epidermis in dicot root. [False]
*Palisade parenchyma cells occur below upper epidermis in dicot **leaf**.
5. Mesophyll contains chlorophyll. [True]
6. Anaerobic respiration produces more ATP than aerobic respiration. [False]
* Anaerobic respiration produces **less** ATP than aerobic respiration.

13. STRUCTURAL ORGANISATION OF ANIMALS

1. An anticoagulant present in saliva of leech is called heparin. [False]
* An anticoagulant present in saliva of leech is called **hirudin**.
2. The vas deferens serves to transport the ovum. [PTA – 6] [False]
* The vas deferens serves to transport the **sperm**.
3. Diastema is a gap between premolar and molar teeth in rabbit. [False]
* Diastema is a gap between **incisors** and **premolar** teeth in rabbit.
4. The cerebral hemispheres of rabbit are connected by band of nerve tissue called corpora quadrigemina. [PTA – 6] [False]
* The cerebral hemispheres of rabbit are connected by band of nerve tissue called **corpus callosum**.

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

1. The phloem is responsible for the translocation of food. [True]
2. Plants lose water by the process of transpiration. [True]
3. The form of sugar transported through the phloem is glucose. [False]
*The form of sugar transported through the phloem is **sucrose**.
4. In apoplastic movement the water travels through the cell membrane and enter the cell. [False]
*In **symplastic** movement the water travels through the cell membrane and enter the cell.
5. When guard cells lose water the stoma opens. [False]
* When guard cells lose water the stoma **closes**.
6. Initiation and stimulation of heart beat take place by nerves. [False]
*Initiation and stimulation of heartbeat take place by **heart muscles(i.e) sino-atrial node**.
7. All veins carry deoxygenated blood. [False]
* All veins **except pulmonary vein** carry deoxygenated blood.
8. WBC defend the body from bacterial and viral infections. [True]
9. The closure of the mitral and tricuspid valves at the start of the ventricular systole produces the first sound 'LUBB'. [True]

15. NERVOUS SYSTEM

1. Dendrons are the longest fibres that conducts impulses away from the cell body. [False]
**Axons are the longest fibres that conducts impulses away from the cell body.*
2. Sympathetic nervous system is a part of central nervous system. [PTA – 3] [False]
Sympathetic nervous system is a part of **autonomic nervous system.*
3. Hypothalamus is the thermoregulatory centre of human body. [True]
4. Cerebrum controls the voluntary actions of our body. [False]
**Cerebellum controls the voluntary actions of our body.*
5. In the central nervous system myelinated fibres form the white matter. [True]
6. All the nerves in the body are covered and protected by meninges. [PTA – 3] [False]
**Brain and Spinal cord is covered and protected by meninges.*
7. Cerebrospinal fluid provides nutrition to brain. [True]
8. Reflex arc allows the rapid response of the body to a stimulus. [True]
Note: Reflex Action allows the rapid response of the body to a stimulus.
9. Pons helps in regulating respiration. [True]

16. PLANT AND ANIMAL HORMONES

1. A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin. [True]
2. Gibberellins cause parthenocarpy in tomato. [True]
3. Ethylene retards senescence of leaves, flowers and fruits. [False]
Ethylene **hastens senescence of leaves, flowers and fruits.*
4. Exophthalmic goitre is due to the over secretion of thyroxine. [True]
5. Pituitary gland is divided into four lobes. [False]
Pituitary gland is divided into **two lobes.*
6. Estrogen is secreted by corpus luteum. [False]
Estrogen is secreted by **graafian follicle (OR) **Progesterone** is secreted by corpus luteum.*

17. REPRODUCTION IN PLANTS AND ANIMALS

1. Stalk of the ovule is called pedicle. [False]
Stalk of the ovule is called **funiculus.*
2. Seeds are the product of asexual reproduction. [False]
Seeds are the product of **sexual reproduction.*
3. Yeast reproduces asexually by means of multiple fission. [False]
Yeast reproduces **vegetatively by means of **budding**.*
4. The part of the pistil which serves as a receptive structure for the pollen is called as style. [False]
The part of the pistil which serves as a receptive structure for the pollen is called as **stigma.*
5. Insect pollinated flowers are characterized by dry and smooth pollen. [False]
****Wind** pollinated flowers are characterized by dry and smooth pollen.*
6. Sex organs produce gametes which are diploid. [False]
Sex organs produce gametes which are **haploid.*
7. LH is secreted by the posterior pituitary. [False]
LH is secreted by the **anterior pituitary.*

8. Menstrual cycle ceases during pregnancy. [True]
9. Surgical methods of contraception prevent gamete formation. [False]
Surgical methods of contraception prevent **the release of gamete.*
10. The increased level of estrogen and progesterone is responsible for menstruation. [False]
The **decreased level of estrogen and progesterone is responsible for menstruation.*

18. GENETICS

1. A typical Mendelian dihybrid ratio of F_2 generation is 3:1. [False]
A typical Mendelian **monohybrid ratio of F_2 generation is 3:1.*
2. A recessive factor is altered by the presence of a dominant factor. [False]
A recessive factor is **masked by the presence of a dominant factor.*
3. Each gamete has only one allele of a gene. [True]
4. Hybrid is an offspring from a cross between genetically different parent. [True]
5. Some of the chromosomes have an elongated knob-like appendages known as telomere. [False]
Some of the chromosomes have an elongated knob-like appendages known as **satellite.*
6. New nucleotides are added and new complementary strand of DNA is formed with the help of enzyme DNA polymerase. [True]
7. Down's syndrome is the genetic condition with 45 chromosomes. [False]
Down's syndrome is the genetic condition with **47 chromosomes (23 pairs(46) +1 extra chromosome)*

19. ORIGIN AND EVOLUTION OF LIFE

1. The use and disuse theory of organs' was postulated by Charles Darwin. [PTA – 5] [False]
The use and disuse theory of organs' was postulated by **Jean Baptiste Lamarck.*
2. The homologous organs look similar and perform similar functions but they have different origin and developmental pattern. [False]
** The **analogous** organs look similar and perform similar functions but they have different origin and developmental pattern.*
3. Birds have evolved from reptiles. [PTA – 5] [True]

20. BREEDING AND BIOTECHNOLOGY

1. Raphano brassica is a man-made allotetraploid produced by colchicine treatment. [True]
***Hint :** புத்தகத்தில் tetraploid என்று மட்டும் தவறாக கொடுக்கப்பட்டுள்ளது.*
2. The process of producing an organism with more than two sets of chromosome is called mutation. [False]
Process of producing an organism with more than two sets of chromosome is called **polyploidy breeding.*
3. A group of plants produced from a single plant through vegetative or asexual reproduction are called a pureline. [False]
Group of plants from single plant through vegetative/asexual reproduction are called **clones.*
4. Iron fortified rice variety determines the protein quality of the cultivated plant. [False]
Iron fortified rice variety determines the **iron quality of the cultivated plant.*

5. Golden rice is a hybrid. [False]
Golden rice is a **genetically modified rice.*
6. Bt gene from bacteria can kill insects. [True]
7. *In vitro* fertilisation means the fertilisation done inside the body. [False]
In vitro fertilisation means the fertilisation done **outside the body.*
8. DNA fingerprinting technique was developed by Alec Jeffrey. [True]
9. Molecular scissors refers to DNA ligases. [False]
Molecular scissors refers to **restriction enzymes.*

21. HEALTH AND DISEASES

1. AIDS is an epidemic disease. [False]
AIDS is an **pandemic disease.*
2. Cancer causing genes are called Oncogenes. [True]
3. Obesity is characterized by tumour formation. [False]
****Cancer** is characterized by tumour formation.*
4. In leukemia both WBCs and RBCs increase in number. [False]
In leukemia, **only WBCs increase in number.*
5. Study of cause of disease is called etiology. [True]
6. AIDS is not transmitted by contact with a patient's clothes. [True]
7. Type 2 diabetes mellitus results due to insulin deficiency. [False]
****Type 1 diabetes** mellitus results due to insulin deficiency.*
8. Carcinogens are cancer causing agents. [True]
9. Nicotine is a narcotic drug. [False]
Nicotine is a **stimulant (or) addictive drug.*
10. Cirrhosis is associated with brain disorder. [False]
Cirrhosis is associated with **liver damage.*

22. ENVIRONMENTAL MANAGEMENT

1. Biogas is a fossil fuel. [False]
** Biogas is **not** a fossil fuel.*
2. Planting trees increases the groundwater level. [True]
3. Habitat destruction cause loss of wild life. [True]
4. Nuclear energy is a renewable energy. [False]
Nuclear energy is a **non-renewable energy.*
5. Overgrazing prevents soil erosion. [False]
Soil erosion **occurs due to overgrazing.*
6. Poaching of wild animals is a legal act. [False]
Poaching of wild animals is **illegal.*
7. National park is a protected park. [True]
8. Wild life protection act was established in 1972. [True]