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ஒரு மதிப்பெண் வினாக்கள்(SCIENCE)

10-ஆம் வகுப்பு SCIENCE பாடப்புத்தகத்தில்

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1 . Laws of Motion

1.Define Inertia. Give its Classification

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

1.Inertia of rest.   2. Inertia of motion

3.Inertia of direction.

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

1 .Like parallel force.   2.Unlike parallel force.

3. State Newton`s Second Law ?

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

4. Why a spanner with a long handle is preferred to tighten screws in heavy vehicles ?

- A spanner with a long handle give high torque with less force.
- Easy using long handle spanner.

5. While catching a cricket ball the fielder lowers his hands backwards. Why ?

- Longer interval of time.
- Lesser impulse on his hand.

6. How does an astronaut float in a space shuttle ?

- Since Space Station and astronaut have equal acceleration.
- They are under free fall condition.
- The state of weightlessness and seem floating.

7. Differentiate mass and weight

Mass	Weight
The quantity of matter contained in the body	The gravitational force exerted on the body
Scalar quantity	Vector quantity
Unit - kilogram	Unit – Newton
It is measured by physical balance	It is measured by spring balance

8.What are the types of inertia ? Give an example for each type.

1. Inertia of rest :

The resistance of a body to change its state of rest called inertia of rest.
Eg. Fruits are detached and fall down.

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2. Inertia of motion :

The resistance of a body to change its state of motion called inertia of motion.

Eg .An athlete runs some distance before jumping.

3. Inertia of direction:

The resistance of a body to change its direction of motion is called inertia of direction.   Eg. Driving a car tend to lean side ways.

9.State the Newton`s law of motion

FIRST LAW:

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

SECOND LAW:

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

THIRD LAW:

For every action there is an equal and opposite reaction.   **F = - F**

10.Describe the rocket propulsion.

- Propulsion of rockets are based on the law of conservation of liner momentum and Newton`s 3rd law.
- Rockets are filled with a fuel.
- The mass of the rocket decreases with increase in velocity of the rocket.
- It reaches a velocity to escape from the gravitational pull of the Earth.
- This velocity is called escape velocity.

2 OPTICS

1.What is refractive Index ?

The ratio of speed of light in Vacuum to the speed of light in a medium is refractive Index of medium $\mu = \dfrac{c}{v}$

2. State Snell`s law.

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

3. Define dispersion of light.

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

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4. State Rayleigh`s law of scattering.

The amount of scattering of light is inversely proportional to the fourth power of its wave length. $S \propto 1/\lambda^4$

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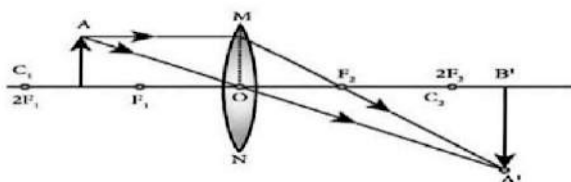
6.Differentiate convex lens and concave lens

Convex lens	Concave lens
Thicker in middle	Thinner in middle
Converging lens	Diverging lens
Real image	Virtual image
Used to treat hypermetropia	Used to treat myopia

7.What are the causes of ``Myopia`` ?

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

8.Why does the sky appears in blue colour ?

According to Rayleigh`s law,The blue colour with shorter wave length scatters to a greater extent, causes the sky to appear in blue colour .

9.Why are traffic signals red in colour ?

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

10.List any five properties of light ?

- Light is a form of energy.
- Travels along a straight line.
- Dose not need any medium.
- Different coloured light has different wave length.
- Speed of light in air or vaccum3×10^8 m/s.

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11.Differentiate Myopia and Hypermetropia.

Myopia	Hypermetropia
Lengthening of eye ball	Shortening of eye lens
Distance objects cannot be seen	Nearby objects cannot be seen
The focal length of the eye lens is reduced	The focal length of the eye lens is increased
Can be corrected using concave lens	Can be corrected using convex lens
It is short sightedness	It is long sightedness

3. THERMAL PHYSICS

1.Define one calorie

Amount of heat energy required to rise the temperature of 1 gram of water through 1°C.

2.State Boyle's law

When the temperature is kept constant, the **volume of gas is inversely proportional to its pressure**. $P \propto 1/V$

3.State-the law of volume (Charles law)

When the pressure is kept constant, the **volume of a gas is directly proportional to the temperature**. $V \propto T$

4.State Avogadro's Law?

At constant pressure and temperature, the **volume of a gas is directly proportional to the number of atoms** or molecules present in it. $V \propto n$

5.Distinguish between ideal gas and real gas

Ideal gas	Real gas
If the atoms or molecules of a gas do not interact with each other	If the atoms or molecules of a gas interact with each other
Force of attraction is very weak	Force of attraction is more
It obeys Boyle's law, Charles law and Avogadro law	It does not obey laws of gases

4. ELECTRICITY

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1.What is electric current?

The **rate of flow of charges** in a conductor.   I = Q/t

2.Define the unit of current .

1   ampere = 1coulomb/1second

3.Which instrument is used to measure the electric current?   Ammeter

4.What happens to the resistance, as the conductor is made thicker?

The resistance **decreases**

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

1. Electric iron   2. Electric heater

6.State Ohm's law.

At a constant temperature, the steady **current** 'I' flowing through a conductor is **directly proportional** to the **potential difference** 'V' . V = IR

7.What connection is used in domestic appliances?

Connected in **parallel**

8.State Joule's law of heating?

$H =$ ▮

5   ACOUSTICS

1.Match it.

Infrasonic	- 10 Hz
Echo	- Ultrasonography
Ultrasonic	- 22 kHz
High pressure region	- Compressions

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2.What is a longitudinal wave ?

The particles of the medium vibrate along the direction of propagation is called longitudinal wave.

3.What is the audible range of frequency?

Between 20 Hz and 20,000 Hz

4.What is the minimum distance needed for and echo?

17.2 m

5.Name three animals, which can hear ultrasonic vibrations.

Mosquito, Dogs, bats.

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

- Moisture content is more in the atmosphere
- Velocity of sound increases as humidity increases.

7.Explain why, the ceilings of correct halls are curved.

- Veilings of concert halls are cruved so that the sound after reflection reaches every corner of the concert hall and the audience ca listen the sound clearly.
- When the sound waves are reflected from the curved surfaces, the intensity of the reflected waves is changed.
- It is due to the multiple reflections of sound waves from the curved walk.

8.Mention two cases in which there is no Doppler effect in sound?

- When source (S) and listener (L) both are at rest.
- When source (S) and Listener (L) moving in mutually perpendicular directions.

9. a) what do you understand by the term 'ultrasonic vibration'?

b) State three uses of ultrasonic vibrations.

c) Name three animals which can hear ultrasonic vibrations.

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a) Ultrasonic vibrations :

- High frequency sound waves beyond the range of human hearing is called Ultrasonic vibration.
- Range of frequency – greater than 20000 Hz(20 KHz).

b) Three uses of ultrasonic vibrations :

- Animals such as bats and frogs use ultrasonic waves to communicate with each other.
- It is used to remove impurities such as grease, oil from glass, metals and ceramics.
- To create the images of the internal organs of the body.

c) Dogs, Bats, and Dolphins

10.What is an echo?

- State two conditions necessary for hearing an echo.
- What are the medical applications of echo?
- How can you calculate the speed of sound using echo?

Echo : An echo is the sound reproduced due to reflection of the original sound from various rigid surfaces.

a) Conditions necessary for hearing an echo :

- The minimum time gap between the original sound and an echo must be 0.1 s
- The minimum distance required to hear an echo is 1/20th

b) Medical applications of echo :

- It is used in obstetric ultrasonography to create real – time visual images of developing embryo or foetus in the mother's uterus.

c) Calculation of speed of sound using echo:

- Speed of sound v = 2d/t.

6 NUCLEAR PHYSICS

1.Match it

Fuel   - Uranium

Moderator   - Heavy water

Control rods   - Water

Shield   - lead

Fe – 59   - Leukemia

I – 131   - Thyroid disease

Na – 24   - Function of heart

C – 14   - Age of fossil

2.Who discovered natural radioactivity?

Henri Becquerel

3.Write any three features of natural and artificial radioactivity.

Natural Radioactivity	Artificial Radioactivity
It takes place on its own in nature	It is induced by man
Spontaneous process	Induced process
Cannot be controlled	Can be controlled
Alpha, Beta, and gama radiations are emitted	Neutron, positron and gama rays are emitted

4.Define one roentgen

The quantity of radioactive substance which produces a charge of 2.58×10^{-4} coulomb in 1

kg of air under STP.

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5.State Soddy and Fajan's displacement law.

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

Beta decay – In daughter nuclei same mass number and atomic number will be increased by 1 unit.

6.Give the function of control rods in a nuclear reactor.

- To control the number of neutrons.
- To control chain reaction.
- Boron and cadmium rods absorb the neutrons.

7.In japan some of the new born children and having congenital diseases. Why?

- Due to high exposure of radiation.
- Caused by atom bomb during second world war.
- It affected the mother who were pregnant at that instant.

8.What is stellar energy?

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

9.Give any two uses of radio isotopes in the field of agriculture?

- To increase the productivity of crops
- To kill the insects and parasites.

11.Explain the process of controlled and uncontrolled chain reactions.

Controlled chain reaction :

- The number of neutrons released is maintained to be one.
- This is achieved by absorbing the extra neutrons with a neutron absorber leaving only one neutron to produce further fission.
- The energy produced was used for construction purpose.
- Used in nuclear reactor to produce energy in sustained manner.

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Uncontrolled chain reaction :

- The number of neutrons multiplies in a very large amount .

- Release of a huge amount of energy within a fraction of a second.

- Used in atom bomb to produce explosion.

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

Properties	Alpha rays	Beta rays	Gama rays
Particle	Helium nucleus	Electrons	Photons
Charge	Positively charge	Negatively charge	Neutral
Ionising power	High	Low	Very low
Penetrating power	Very low	High	Very high
Speed	1/10 to 1/20 times the speed of light	Upto 9/10 times the speed of light	Travel with the speed of light.

13.What is a nuclear reactor? Explain its essential parts with their functions.

Device in which the nuclear fission reaction takes place in a self-sustained and controlled

manual to produce electricity is called Nuclear reactor

Fuel	A fissile material is used as fuel. Eg. Uranium
Moderator	Used to slow down the high energy neutrons to provide slow neutrons Eg. Graphite and heavy water.
Control rod	Used to control the number of neutrons Eg. Boron or cadmium Rods.
Coolant	To remove the heat. Eg.Water , air and helium.
Protection wall	It is made up of thick concrete lead wall to prevent the harmful radiations.

CHEMISTRY

7. ATOMS AND MOLECULES

1.Define: Atomicity

The number of atoms present in the molecule is called its atomicity

E.g: Atomicity of Phosphorus (P_4) = 4,   Atomicity of HCl =2.

2. What is the molar volume of a gas?

One mole of any gas occupies 22.4 litre at S.T.P.

3.Give any two examples for heterodiatomic molecules.

1. Hydrogen Chloride (HCl)   2. Carbon monoxide (CO)

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

1. An atom is divisible.

2. (E = mc^2)

3.Atom is the smallest particle

4.Isotopes ($_{17}Cl^{35}$, $_{17}Cl^{37}$)

5. Isobars ($_{18}Ar^{40}$, $_{20}Ca^{40}$).

6. Atoms are destructible

7. Atoms may not always combine in a simple whole number ratio.

(E.g: Glucose $C_6H_{12}O_6$

5. Derive the relationship between Relative molecular mass and Vapour density.

Vapour Density (V.D) = Mass of a given volume of gas $/$ Mass of the same volume of

hydrogen

According to Avogadro's law

V.D =Mass of 'n' molecules of a gas $/$ Mass of 'n' molecules of hydrogen

since hydrogen is diatomic

V.D= Mass of 1 molecules of a gas $/$ Mass of 2 atoms of hydrogen

V.D= Relative molecular mass $/$ 2

Relative molecular mass = 2 x vapour density.

6.State the applications of Avogadro's law.

- It explains Gay-Lussac's law.

- Molecular formula of gases can be derived

- It determines the relation between molecular mass and vapour density

- It helps to determine gram molar volume of all gases.

7.Write the different types of isotopes of oxygen and its percentage abundance Isotopes of oxygen:.

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

8.PERIODIC CLASSIFICATION OF ELEMENTS

8.What is rust? Give the equation for formation of rust.

When iron is exposed to moist air, it forms a layer of brown hydrated ferric oxide on its

surface.

This compound is known as rust .

$4Fe + 3O_2 + xH_2O \longrightarrow 2Fe_2O_3 \cdot xH_2O$
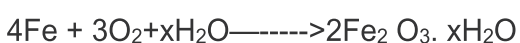
9.State two conditions necessary for rusting of iron.

- Moist air

- Presence of oxygen

- Presence of water

10.What is amalgam? Give example.

An amalgam is an alloy of mercury with another metal.Eg.Silver tin amalgam.
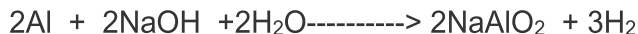
11.Define alloys.

An alloy is a homogeneous mixture of two or more metals with certain non metalic

elements.

12. Metal A belongs to period 3 and group 13. A in red hot condition reacts with steam to form B. A with strong alkali forms C. Find A,B and C with reactions

$2Al + 3H_2O \longrightarrow Al_2O_3 + 3H_2$

  (A)   (B)

$2Al + 2NaOH + 2H_2O \longrightarrow 2NaAlO_2 + 3H_2$

                             (C)

A-Aluminium

B -Aluminium oxide

C- sodium meta aluminate

13.A is a reddish brown metal, which combines with O_2 at < 1370K gives B, a black coloured compound. At a temprature> 1370K A gives C which is red in colour. Find A, B and C with reaction.

  A- reddish brown metal - copper

$2Cu + O_2 \xrightarrow{<1370K} 2CuO$

   (A)   (B)

        (copper II oxide – black)

$4Cu + O_2 \xrightarrow{>1370K} 2Cu_2O$

                   (C)

        (Copper Ioxide-red)

- A-Copper (Cu)
- B-Copper II oxide (CuO)
- C-Copper I oxide (Cu_2O)

14.A is a silvery white metal. A combines with O2 to form B at 800°C, the alloy of A is used in making the aircraft. Find A and B.

A-silvery white metal - Aluminium

$4Al + 3O_2 \xrightarrow{800°C} 2Al_2O_3$

 A-Aluminium

 B-Aluminium oxide

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15. The electronic configuration of metal A is 2, 8, 18, 1.The metal A when exposed to air and moisture forms B a green layered compound. A with con. H2SO4, forms C and D along with water. D is a gaseous compound. Find A, B, C and D.

$$2Cu + O_2 + CO_2 + H_2O \longrightarrow CuCO_3.Cu(OH)_2$$

(A)   (B)

$$Cu + 2H_2SO_4 \longrightarrow CuSO_4 + SO_2\uparrow + 2H_2O$$

                            (C)   (D)
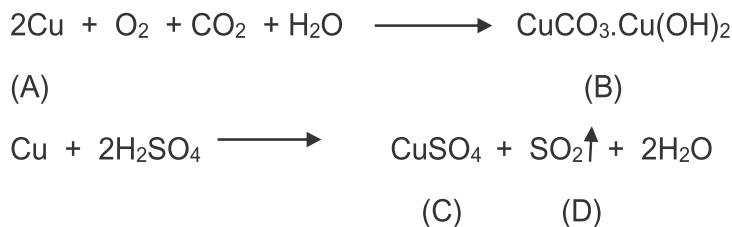
A-Copper

B-Copper carbonate

C - Copper sulphate

D- Sulphur dioxide gas

9.SOLUTION

16. What is meant by binary solution?

  Solutions with two components are called binary solutions.E.g: salt in water.

17. Hot saturated solution of copper sulphate forms crystals as it cools. Why?

It is due to the water of crystallization.

when heated loses its five water molecules

 On cooling, the salt turns back into hydrated salt crystals.

18. Write notes on.

Saturated solution: A solution in which no more solute can be dissolved E.g: 36 g of NaCl in 100 g of water

Unsaturated solution: An unsaturated solution contains less solute E.g: 10 g NaCl in 100 g of water

SCIENCE

19.Write notes on various factors affecting solubility.

There are three main factors.

1.Nature of the solute and solvent:

- Polar compound dissolves readily in polar solvent eg.NaCl in water
- Non-polar compounds are soluble in non-polar solvents. E.g: Fat dissolved in ether.

2.Effect of Temperature:

- In endothermic process, solubility increases with increase in temperature
- In exothermic process, solubility decreaseswith increase in temperature.
- Solubility of gases in liquid decrease with increase in temperature.

3.Effect of Pressure:

- When the pressure is increased, the solubility of a gas in liquid increases.E.g: carbonated beverages

20.The aquatic animals live more in cold region. Why?

- More amount of dissolved oxygen
- The solubility of oxygen in water is more at low temperatures.

21.What happens when $MgSO_4.7H_2O$ is heated? Write the appropriate equation.

It loses seven water molecules

$$MgSO_4. 7H_2O \xrightarrow{\Delta} MgSO_4 + 7H_2O$$
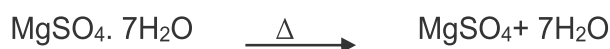
22.What is aqueous and non- aqueous solution? Give an example.

Aqueous solution:

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

E.g: Common salt in water

Non - Aqueous solution:

The solution in which any liquid, other than water, acts as a solvent is called a non aqueous solution.

E.g: Sulphur dissolved in carbon disulphide.

23.A' is a blue coloured crystalline salt. On heating it loses blue colour and to give 'B'.

When water is added, 'B' gives back to 'A'. Identify A and B, write the equation.

A-blue colour crystalline salt - Copper sulphatepentahydrate

equation: $Cuso4: 7H20 \xrightarrow[\text{cooling}]{\Delta} Suso4 + 7H_2o$
                                                                                         B
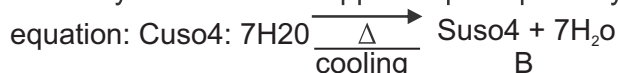
B-Anhydrous copper sulphate

24.Define Hydrated salt.

The number of water molecules found in the crystalline substance is called water of

crystallization.Such salts are called hydrated salts.Eg: Blue vitriol

25.Define-solubility.

Solubility is defined as the number of grams of a solute that can be dissolved in 100 g of

a solvent to form its saturated solution at a given temperature and pressure.

Solubility= Mass of the solute/ Mass of the solvent X100

26.Define Solution.

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

27.Classify the following substances into deliquescent, hygroscopic. Conc. Sulphuric acid, Copper sulphate penta hydrate, Silica gel, Calcium chloride and Gypsum salt.

Hygroscopic:	Deliquescent:
Conc. sulphuric acid, Silica gel	Copper sulphate penta hydrate,Calcium chloride,Gypsum salt

28.Give an example each

Solute Solvent	Example
Gas in liquid.	Soda water
Solid in liquid.	Salt in water
Solid in solid.	Alloys
Gas in gas.	Mixture of Helium - Oxygen gases

29.In what way hygroscopic substances differ from deliquescent substances.

Hygroscopic substances	Deliquescence substances
They absorb moisture and do not dissolve.	They absorb moisture and dissolve.
Do not change its physical state	Change their physical state
Amorphous solids	Crystalline solids
Used as drying agents. Eg.Quick lime,	Forming saturated solutions. E.g: Caustic soda

10.TYPES OF CHEMICAL REACTIONS

30.What are the methods of preventing corrosion?

- Alloying -stainless steel

- Galvanizing- coating zinc on iron sheets

- Electroplating- coating one metal over another metal by passing current

- Anodizing-Converse the metal surface into a decorative

- Cathodic protection - coated with sacrificial metal

31.Explain the factors influencing the rate of a reaction.

- Nature of the reactants

- Concentration of the reactants

- Temperature

- Catalyst

- Pressure

- Surface area of the reactants

32.How does pH play an important role in everyday life?

- Our body works, within the pH range of 7.0 to 7.8.,

- pH of blood ranges from 7.35 to 7.45.

- pH of the stomach fluid is 2.0

- pH of the saliva 6.5 to 7.5.

- pH of soil

- Citrus fruits - alkaline soi

- rice -acidic soil.

- Sugarcane -neutral soil.

- pH of rain water-7,less than 7 acid rain

34.Define chemical equilibrium.

Rate of forward reaction = Rate of backward reaction.

35. A solid compound 'A' decomposes on heating into 'B' and a gas 'C'. On passing the gas 'C' through water, it becomes acidic. Identify A, B and C.

$CaCO_{3(S)-} \longrightarrow CaO_{(S)} + CO_{2(g)}$

   (A)   (B)   (C)
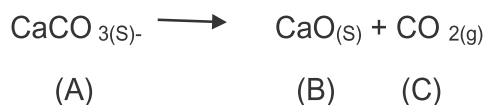
A - $CaCO_3$

B – CaO

C - CO_2

36.Differentiate reversible and irreversible reactions.

Reversible Reaction	Irreversible Reaction
Can be reversed	Cannot be reversed
Attains equilibrium	Equilibrium is not attained
Slow.	Fast

11.CARBON AND ITS COMPOUNDS

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

Ethanoic acid is prepared by the oxidation of ethanol in the presence of alkaline

potassium permanganate or acidified potassium dichromate.

$CH_3CH_2OH \quad \underline{KMnO_4/OH} \longrightarrow CH_3COOH + H_2O$

  Ethanol   2[O]   Ethanoic acid
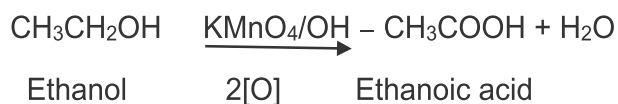
38.What is called TFM?

   TFM-Total Fatty Matter.

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

Homologous series:

A class of organic compounds having same general formula

Characteristics:

- Have the same elements and functional group.
- General molecular formula.
- Similar chemical properties
- prepared by a common method.

40.How is ethanol manufactured from sugarcane?

Ethanol is prepared from Molasses by fermentation process.

Dilution of molasses:

Molasses is first diluted with water to bring down the concentration of sugar to about 8 to 10 percent.

Addition of nitrogen source

If the nitrogen content of the molasses is poor, it may be fortified by the addition of ammonium sulphate or ammonium phosphate

Addition of yeast:

The enzymes invertase and zymase present in yeast, convert sucrose into ethanol. The fermented liquid is technically called wash.

Distillation of 'Wash':

Ethanol which contains 95.5% of ethanol and 4.5% of water it is called rectified spirit. On distillation of this mixture, purealcohol100% is obtained. This is called absolute alcohol.

41.Differentiate soaps and detergents.

Soap	Detergent
It is a sodium salt of long chain fatty acids	It is sodium salts of sulphonic acids
It is prepared from vegetable oils	It is prepared from crude oil.
Biodegradable	non- biodegradable.
poor foaming capacity	rich foaming capacity.
It forms a scum in hard water	Does not form a scum in hard water

SCIENCE

42.Classify the following compounds based on the pattern of carbon chain and give their structural formula

i.Propane

ii.Benzene

iii.Cyclobutane

iv. Furan

Name	Class		Structural Formula
1.Propane	Acyclic Compound		$CH_3-CH_2-CH_3$
2.Benzene	Cyclic Compound	Aromatic compound	C_6H_6
3.Cyclobutane		Alicyclic Compound	C_4H_8
4.Furan		Hetrocyclic compound	C_4H_4O

43. Write uses of Ethanol:

1. In medical wipes, as an antiseptic.

2. As an anti - freeze in automobile radiators.

44. Identify and name the functional groups present in the following compounds.

COMPOUND	FUNCTIONAL GROUP	SUFFIX
ALCOHOL	-OH	-ol
ALDEHYDE	-CHO	-al
KETONE	C=O	-one
CARBOXYLIC ACID	-COOH	-oic acid

45.Lemon juice has a $p^H = 2$, what is the concentration of H^+ ion

Since, $pH = -\log[H^+]$

$pH = \log[H^+]$

$[H^+] = 10^{-2} \, pH$

$= 10^{-2}$

$= 0.01$ moles / litre.

46.Find the percentage of nitrogen in ammonia.

Molar mass NH_3 = (1atomic mass of nitrogen) +(3 x atomic mass of hydrogen)

$= (1 \times 14) + (3 \times 1)$

$= 14 + 3$

$= 17g$

Percentage of N in NH_3 = mass of nitrogen/molarmass of NH_3 x100

= (14/17)x100

= 0.8235x10

The percentage of nitrogen in ammonia = 82.35%

47.Calculate the number of water molecule present in one drop of water which weigh 0.18 g

Avogadro number= 6.023 x1023

Given Mass= 0.18g

Molecular weight of water (H2O)= (2 atomicnumber of H) +(1x atomic number of O)

= (2 x1) + (1 x16) = 2 + 16 = 18g

Number of molecules of one drop of water = $(6.023 \times 10^{23} \times 0.18)/18$

$= 6.023 \times 10^{23} \times 0.01$

$= 0.06023 \times 10^{23}$

48.Calculate the molecular masses ofCO$_2$

Molecular mass of CO2 = 1 x atomic mass of C + 2 x atomic mass of O

= (1x12) + (2 x16) = 12 + 32 = 44g

49.Calculate the PH of 1.0x10^{-4} molar solution of HNO$_3$.

$HNO_3 \longrightarrow H^+ + NO_3{}^{2-}$

PH=-log10 [H+]

$H^+=1.0x10^{-4}$

PH= -log10 $(1.0x10^{-4})$

$=-(-4x1log_{10}10)$

PH = 4

50.What is the PH of 1.0x10^{-5} molar solution of KOH?

$KOH_{(aq)} \rightarrow K^+{}_{(aq)} + OH^-{}_{(aq)}$

$[OH^-]=1x10^{-5}$ mol.litre-1

$pOH=-log_{10}[OH^-]$

$=-log10 x10^{-5}$

$=-(-5xlog_{10}10)=-(-5)=5$

pH+pOH=14

pH=14- pOH

pH=14 – 5=9.

SCIENCE

51.Find pH of 0.01M HNO_3

[H +]=0.01

pH =-log 10[H^+]

pH = - log10 [0.01]

pH = - log10 [1 x10^{-2}]

pH=-(- 2 x $log_{10}10$)

pH = 2

52.The hydroxide ion concentration of a solution is 1x10-11 M What is the pH of the solution?

pOH =-log $_{10}$ [OH^-]

pOH = - log_{10}[1 x 10^{-11}]

pOH =-[-11 log $_{10}$10]

pOH = - [- 11]

pOH = 11

pH + pOH = 14

pH = 14 - pOH

    = 14 – 11

  pH = 3

53. [OH-] = 1.0 x 10^{-11} Find the pH ?

[OH^-] =1 x 10^{-11}

pOH = - log_{10}[OH^-]

= - log_{10} 1 x10^{-11}

=-(-11) log_{10}10

pOH = 11x1 = 11

pH = 14 -pOH

pH = 14 – 11
pH =3

54.Calculate the number of moles in 27 g of Al 1.51x10²³molecules of NH₄Cl.

Number of moles = Number of molecules / Avogadro Number

$= 1.51 \times 10^{23} / 6.023 \times 10^{23} = 15/60$

$= \frac{1}{4}$

$= 0.25$ mole

12.PLANT ANATOMY AND PLANT PHYSIOLOGY

1.What is collateral vascular bundle?

Xylem lies towards the centre and phloem lies towards the periphery.

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

Carbon dioxide taken from atmosphere

3. What is the common step is aerobic and anaerobic path way?

Glycolysis

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

Anaerobic respiration.

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

Vascular bundles of dicot stem are conjoint collateral, endarch and open.

They are arranged in the form of a ring around the pith.

6.Write a short note on mesophyll.

In a leaf, the tissue present between the upper and lower epidermis is called mesophyll.

It is differentiated into palisade parenchyma and Spongy parenchyma.

**7. Name the three basic tissue system in flowering plants.**

- Dermal (or) Epidermal tissue system
- Ground tissue system
- Vascular tissue system

SCIENCE

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

Photosynthesis is a process by which autotrophic organisms like green plants, algae and chlorophyll containing bacteria utilize the energy from sunlight to synthesize their own food. Photosynthesis occur in the chloroplast.

9. Why should the light dependent reaction occur before the light independent reaction?

During light independent reactions, CO_2 is reduced into carbohydrates with the help of ATP and $NADPH_2$.So light dependent reaction occur before the light independent reaction.

10. Write the reaction for photosynthesis.

$$6CO_2 + 12H_2O \xrightarrow{\hspace{3cm}} C_6H_{12}O_6 + 6H_2O + 6O_2$$

Chlorophyll / sunlight
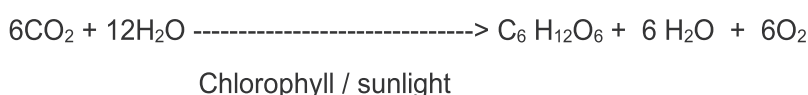
11. What is R.Q?

It is the ratio of volume of carbon dioxide liberates and the volume of oxygen consumed during respiration

RQ = volumeof CO_2 liberated / volumeof O_2 consumed

12. Write down the functions of chloroplast

- Photosynthesis
- Storage of starch
- Synthesis of fatty acids.
- Storage of lipids.

13. What are the factors affecting photosynthesis

External factors $\rightarrow$ Light, Co2, temperature, water and mineral elements.

Internal factors $\rightarrow$ Pigments, leaf age, accumulation of carbohydrates and hormones.

13. STRUCTURAL ORGANISATION OF ANIMALS

1.Give the common name of the Hirudinariagranulosa.

The Indian Leech

2. How does leech respire?

Respiration takes place through the skin in leech.

3. Write the dental formula of rabbit.

Dental formula is I 2/1 ,C 0/0 ,PM 3/2, M 3/3

2033 /1023

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

11 pairs of teeths.

5. How is diastema formed in rabbit?

The gap between the incisors and premolar is called diastema

6. What organs are attached to the two bronchi?

Lungs

7. Which organ acts as suction pump in leech?

Muscular pharyns

8. What does CNS stand for?

CNS →→ Central Nervous System.

9. Why is the teeth of rabbit called heterodont?

In Rabbit teeth are of different types

10. How does leech suck blood from the host?

Leech make a triadiate or Y shaped incision in the skin of the host and the blood is sucked by Muscular pharynx.

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

Tracheal walls are supported by rings of cartilage, which helps in the free passage of air.

12. List out the parasitic adaptations in leech.

Blood is sucked by pharynx.

The three jaws inside the mouth, caused a painless y shaped wound in the skin of the host. The salivary glands produced hirudin which does not allow the blood to coagulate. Parapodia and setae are completely absent.

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

SCIENCE

1. Name two layered protective covering of human heart.   Pericardium

2. What is the shape of RBC in human blood?   Biconcave and disc shaped.

3. Why is the colour of the blood red ?   Presence of haemoglobin in RBC

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

5. Name the heart valve associated with the major arteries leaving the ventricles.
Semi - lunar valves

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

7. What causes the opening and closing of guard cells of stomata during transpiration?
- The opening and closing of the stomata is due to the change in turgidity of the guards
  cells.
- When water enters into guard cells, they become turgid and the stoma open.
- When the guard cells lose water, it become flaccid and the stoma closes.

8. What is cohesion?
The force of attraction between molecules of water is called cohesion.

9. Trace the pathway followed by water molecules from the time it enters a plant root to the time it escapes into the atmosphere from a leaf.
Root hair ---> Root --->Xylem ---> Stem ---> Leaf ---> Stomata ---> Water is
evaporated

10. What would happen to the leaves of a plant that transpires more water than its absorption in the roots?
- If the leaves of a plant transpires more than its absorption in the roots,
- The plant will get dehydrated and it affects plant growth, photosynthesis and
  transpiration

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

The structure of the human heart
- The human heart is four chambered. There are two atrium and two ventricles.

Working of the human heart

SCIENCE

- The right atrium receives deoxygenated blood from different parts of the body
- The right and left articles pump blood into the right and left ventricles respectively.
- From the right ventricle arises the pulmonary trunk, which bifurcates to form right and left pulmonary arteries.
- The right and left pulmonary arteries supply deoxygenated blood to the lungs of the respective side.
- The left ventricle gives rise to aorta. The oxygenated blood is supplied by the aorta to various organs of the body.

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

- For Human it is double circulation because the heart contains completely separated four chambers
- The Oxygenated blood donot mix with the deoxygenated blood

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

- The rhythmic closure and opening of the valves cause the sound of the heart.
- The first sound LUBB is longer duration and produced by the closure of the tricuspid
- The second sound DUPP is of a shorter duration and produced by the closure of semilunar valves

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

- Regulate the flow of blood in a single direction
- Prevent back flow of blood.

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

- Rh factor was discovered by Landsteiner and Wiener in Rhesus Monkey.
- So it is named as Rh factor.

16. How are arteries and veins structurally different from one another? Artery Vein

Artery	Vein
• Distributing vessel	Collecting vessel
• Pink in colour	Red in colour
• Deep location	Superficial in location
• Blood flow with high pressure	Blood flow with low pressure
• Wall of artery is strong thick and elastic	Wall of vein is weak, thin and non-elastic
• All arteries carry oxygenated blood except pulmonary arteries	All veins carry deoxygenated blood expect pulmonary veins
• Internal valves are absent	Internal valves are present

SCIENCE

17.Enumerate the functions of blood.

Functions of blood
- Transport of respiratory gases
- Transport of digested food materials to the different body cells.
- It is involved in protection of the body and defense against diseases.
- It acts as buffer and helps in regulation of pH and body temperature.
- It maintains proper water balance in the body.

15. NERVOUS SYSTEM

1.Define stimulus.

It refers to the changes in the environmental condition.

2. Name the parts of the hind brain.

(i) cerebellum (ii) pons   (iii) medulla oblongata.

3. Give an example for conditioned reflexes.
- Playing harmonium by striking a particular key on seeing a music note is an example of conditioned reflexes.

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

Hypothalamus

5.Define reflex arc.

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

6.What are the structures involved in the protection of brain?
(i) Duramater   (ii) Arachnoid (iii) Piamater

7.With a neat labelled diagram explain the structure of a neuron.
A neuron typically consists of three basic parts: Cyton, Dendrites and Axon.

(i) Cyton: (cell body or perikaryon)
❖   It help in transmission of nerve impulses to and from the cell body.

(ii) Dendrites:
❖   These are the numerous branched cytoplasmic processes that project from the surface of the cell body.
❖   They conduct nerve impulses towards the cyton.

SCIENCE
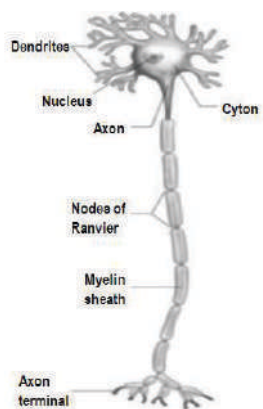
(iii) Axon:

❖ The axon is a single, elongated, slender projection.
❖ The axons may be covered by a protective sheath called **myelin sheath**
❖ **myelin sheath** is further covered by a layer of **Schwann cells** called **neurilemma**.

❖ Myelin sheath breaks at intervals by depressions called **Nodes of Ranvier**. The region between the nodes is called as **internode**

16. PLANT AND ANIMAL HORMONES

Short Answers

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

2. Write the name of a synthetic auxin. 2,4 D

3. Which hormone induces parthenocarpy in tomatoes? Gibberellin

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

Prolactin or lactogenic hormone

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

Minneralocorticoids - Aldosterone

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

7. Which gland secretes digestive enzymes and hormones? Pancreas

8. Name the endocrine glands associated with kidneys. Adrenal

9. What are synthetic auxins? Give examples.

• Artificially synthesized auxins that have properties like auxins are called as synthetic auxins. *Example:* 2, 4 D (2,4Dichlorophenoxy Acetic Acid)

10. What is bolting? How can it be induced artificially?

• Sudden shoot elongation followed by flowering is known as **bolting**.
• It can be artificially induced on rosettle plants by the treatment of Gibberellin

11. Bring out any two physiological activities of abscisic acid.

- ABA promotes – Abscission
- During water stress and drought conditions ABA causes stomatal closure.

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

Auxins **prevent** the formation of **abscission layer**.

13. What are chemical messengers?

Hormone.

14. Write the differences between endocrine and exocrine gland.

Endocrine glands	Exocrine glands
Without ducts	With ducts
Secrete hormones	Produce enzymes
Ex. Pituitary, Thyroid	Salivary glands, Gastric glands

Lesson 17-19

1. Define triple fusion

- ➢ In plants, during fertilization one sperm fuses with the egg to form a diploid zygote (2n)
- ➢ The other sperm(n) fuses with the secondary nucleus(triple fusion)

2. Name the secondary sex organ in male.

- ➢ Penis
- ➢ Vas deferens
- ➢ Epididymis
- ➢ Seminal vesicles
- ➢ Prostate gland

3. Write the characteristics of insect pollinated flowers.

- ➢ To attract insects these flowers are brightly coloured
- ➢ Have smell and nectar
- ➢ Pollen grains are larger in size

SCIENCE

4.Identify the parts A,B,C and D
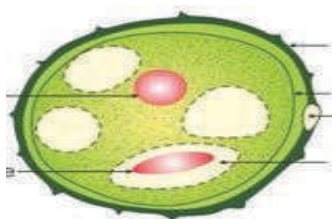
A-exine

B- Intine

C- generative cell

D-vegetative nucleus

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

➢ Short life span,.

➢ It is easy to cross pollinate

➢ The flowers are bisexual.

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

➢ Phenotype -The External expression of a particular in an organism.

➢ Genotype -The genetic expression of a particular in an organism.

7.What are allosomes?

➢ Chromosome which responsible for determining the sex of an individual.

➢ They all so called as sex chromosome or hetero chromosomes.

8.What are the okazaki fragments?

➢ During replication of DNA molecule,

➢ Lagging strand short segments of DNA are synthesized.

➢ Short segments of DNA are called okazaki fragments

9.What is the biological significance of DNA?

➢ Transmission of hereditary information from one generation to next generation

➢ It contain information required for the formation of proteins

10.Define ethnobotany and write its importance.

➢ Ethnobotany is the study of regions plants

➢ practical uses through the traditional knowledge of the local culture of people.

Importance of Ethnobotany

➢ It provides traditional uses of plants.

➢ It gives information about certain unknown and known useful plants.

12.Why is Archaeopteryx considered to be a connecting link?

➢ Fossil bird

➢ Connecting link between reptiles and birds

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

➢ The age of fossils is determined by radioactive elements present in it .

➢ they may be carbon , uranium

20. BREEDING AND BIOTECHNOLOGY

1) Define genetic engineering

Genetic engineering is the manipulation and transfer of genes from one organisms to another organisms to create a new DNA called as recombinant DNA (rDNA).

2) Name the types of stem cells

• Embryonic stem cells

• Adult stem cells (or) somatic stem cells

3) what are the transgenic organisms?

Plants or Animals expressing a modified endogenous gene or a foreign gene are also known as transgenic organisms.

4) Distinguish between:

S.No	Somatic gene therapy	Germ line gene therapy
1	It is the replacement of defective genes in somatic cells	It is the replacement of defective genes in somatic cells such as egg and sperm
2	Corrected gene may not be carried to the next generation	Corrected gene may be carried to the next generation

SCIENCE

S.No	Undifferentiated cells	Differentiated cells
1	They are unspecialised cell	These are specialised cell
2	Eg: earlier stage of embryo	Eg: muscle cell, blood cell and nerve cell

S.No	Out breeding	In breeding
1	The breeding of two unrelated animals	The breeding of closely related animals
2	The hybrids are stronger and vigorous than their parents.	Continued inbreeding reduces fertility and productivity.

5) Discuss the importance of biotechnology in the field of medicine

- Insulin used in the treatment of diabetes.
- Growth hormone used for treating children with growth deficiencies
- Development of vaccine against various diseases like hepatitis B and rabies

21 Health and Diseases

1) What are psychotropic drugs ?

Drugs that act on brain and alter the behaviour ,consciousness, power of thinking and perception are called psychotropic drugs or mood altering drugs

2) Mention the diseases caused by tobacco smoke.

i) Lung cancer   ii) Bronchitis   iii) Oral cancer   iv) Emphysema

3) what are the contributing factors for Obesity ?

i) Genetic factors   ii) physical inactivity   iii) Excessive eating
iv) Endocrine factors

3) What is Metastasis ?

The cancerous cells migrate to distant parts of the body and affect new tissues.

SCIENCE

4) How is cancer cell different from a normal cell ?

S.No	Normal cell	Cancerous Cell
1	They have controlled cell division	They have uncontrolled cell division
2	Normal growth	Abnormal growth

5) Differentiate between Type 1 and Type 2 diabetes mellitus.

Factors	Type 1 Insulin dependent	Type 2 Non - Insulin dependent
Prevalence	10-20%	80-90%
Age of onset	< 20years	> 30 years
Body weight	Normal	Obese

6) Suggest measure to overcome the problems of an alcoholic.

- Education and counselling
- Physical activity
- Seeking help from parents and peer groups
- Medical assistance

7) What precautions can be taken for preventing heart diseases ?

- Diet management
- Physical activity
- Addictive substance avoidance (alcohol consumption and smoking)

22 ENVIRONMENTAL MANAGEMENT

1) What will happen if tree are cut down ?

- Soil erosion
- Loss of wild life
- Extinction of species
- Imbalance of biogeochemical cycle

2) What are the agents of soil erosion ?

- High velocity wind
- Air currents

SCIENCE

- Flowing water

- Land slide

3) Why fossil fuels are to conserved

- Fossil fuel are non –renewable sources of energy

- The fossil fuel are formed slowly over millions of years

- They should be conserved by limiting their use

4) What are the importance of rainwater harvesting ?

- To meet the increase in demand of water

- Reduce flood and soil erosion

- Overcome the rapid depletion of water levels.

- Water stored in ground is not contaminated by human

5) What are the advantages of using biogas ?

- It born without smoke

- Causes less pollution

- An excellent way of rid of organic wastes like bio-waste and sewage material

- It is safe and convenient to use

6) How does rainwater harvesting structures recharge ground water?

- Roof top rainwater harvesting

- Recharge pit

7) How will you prevent soil erosion ?

- Retain vegetation cover ,so that soil is not exposed

- Cattle grazing should controlled

- Crop rotation and soil management improve soil organic matter

- Wind speed can be controlled by planting trees in the form of a shelter belt

23. VISUAL COMMUNICATION

SCIENCE

1. What is Scratch?

'Scratch' is a software used to create animations, cartoons and games easily. Scratch, on the other hand, is a visual programming language.

2. Wirte a short note on editor and its Main Parts.

The Scratch editor has three main Parts

1. Stage   2. Sprite   3. Script

1. Stage : ⋆ Stage is the background appearing when we open the scratch window

⋆ The background will most often be white

2. Sprite : The Characters on the background of Scratch window are known as sprite.

3. Script: 1. Where you edit your Programs or your Sprite's Pictures.

3. What is Stage?

- Stage is the background appearing when we open the scratch window.
- The background will most often be white.
- You can change the background colour as you like.

4. What is Sprite?

- The characters on the background of a Scratch window are known as Sprite.
- Usually a cat appears as a sprite when the Scratch window is opened.
- The software provides facilities to make alternations in sprite.

SCIENCE

Choose the best answer

1. Laws of Motion

1. Inertia of a body depends on

a. weight of the object

b. acceleration due to gravity of the planet

c. mass of the object   d. Both a & b

2. Impulse is equal to

a. rate of change of momentum

b. rate of force and time

c. change of momentum

d. rate of change of mass

3. Newton's III law is applicable

a. for a body is at rest

b. for a body in motion

c. both a and b

d. only for bodies with equal masses

4. Plotting a graph for momentum on the X-axis and time on Y-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. cms^{-1} b. Nkg^{-1} c. $N\ m^2\ kg^{-1}$

d. $cm^2\ s^{-2}$

7. One Kilogram force equals to

a. 9.8 dyne   b. 9.8×10^4 N

c. 98×10^4 dyne   d. 980 dyne

8. The mass of a body is measured on planet Earth as M kg. When it is taken to a planet of radius half that of the Earth then its value will be _____ kg

a. 4 M   b. 2M   c. M/4

d. M

9. If the Earth shrinks to 50% of its real radius its mass remaining the same, the weight of a body on the Earth will

a. decrease by 50%

b. increase by 50%

c. decrease by 25%

d. increase by 300% `

10. To project the rockets whice of the following principle(s) is /are required?

a. Newton's third law of motion

b. Newton's law of gravitation

c. law of conservation of linear momentum

d. both a and c

2. OPTICS

11. 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

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

c) zero   d) none of the above

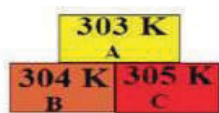23. If a substance is heated or cooled, the linear expansion occurs along the axis of

a) X or –X   b) Y or –Y

c) both (a) and (b)   d) (a) or (b)

24. 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

25. Inthe Given diagram, the possible direction of heat energy transformation

a) A ← B, A ← C, B ← C

b) A → B, A → C, B → C

c) A → B, A ← C, B → C

d) A ← B, A → C, B ← C

4. ELECTRICITY

26. 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.

27. SI unit of resistance is

a) mho b) joule c) ohm d) ohm meter

28. 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.

29. Kilowatt hour is the unit of

a) resistivity   b) conductivity

c) electrical energy   d) electrical power

5. ACOUSTICS

30. When a sound wave travels through air, the air particles

a) vibrate along the direction of the wave motion b) vibrate but not in any fixed direction

c) vibrate perpendicular to the direction of the wave motion

d) do not vibrate

31. Velocity of sound in a gaseous medium is 330 m_1s . 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}

32. The frequency, which is audible to the human ear is

a) 50 kHz   b) 20 kHz

SCIENCE

c) 15000 kHz   d) 10000 kHz

33. 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 ms^{-1} b) 165 ms^{-1}

c) 330 × √2 ms^{-1}

d) 320 / √2 ms^{-1}

34. If a sound wave travels with a frequency of 1.25 × 104 Hz at 344 ms^{-1} the wavelength will be

a) 27.52 m   b) 275.2 m

c) 0.02752 m   d) 2.752 m

35. 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

36. Velocity of sound in the atmosphere of a planet is 500 m s^{-1}. The minimum distance between the sources of sound and the obstacle to hear the echo, should be

a) 17 m   b) 20 m   c) 25 m   d) 50 m

6. NUCLEAR PHYSICS

37. Man-made radioactivity is also known as _____.

a. Induced radioactivity

b. Spontaneous radioactivity

c. Artificial radioactivity

d. a & c

38. Unit of radioactivity is _____.

a. roentgen   b. curie

c. becquerel   d. all the above

39. Artificial radioactivity was discovered by _____.

a. Bequerel   b. Irene Curie

c. Roentgen   d. Neils Bohr

40. In which of the following, no change in mass number of the daughter nuclei takes place

i) α decay ii) β decay iii) g decay iv) neutron decay

a. (i) is correct

b. (ii) and (iii) are correct

c. (i) & (iv) are correct

d. (ii) & (iv) are correct

41. _____ isotope is used for the treatment of cancer.

a. Radio Iodine

b. Radio Cobalt

c. Radio Carbon

d. Radio Nickel

42. 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

43. _____ aprons are used to protect us from gamma radiations

a. Lead oxide b. Iron c. Lead

d. Aluminium

SCIENCE

44. Which of the following statements is/are correct?

i) α particles are photons

 ii) Penetrating power of γ radiation is very low

 iii) Ionization power is maximum for α rays

iv) Penetrating power of γ radiation is very high

a. (i) & (ii) are correct

b. (ii) & (iii) are correct

c. (iv) only correct

d. (iii) & (iv) are correct

45. Proton - Proton chain reaction is an example of _____.

 a. Nuclear fission   b. α - decay

c. Nuclear fusion   d. β – decay

46. In the nuclear reaction $_6X^{12}$ decay $_ZY^A$, the value of A & Z.

a. 8, 6   b. 8, 4   c. 4, 8

 d. cannot be determined with the given data

47. Kamini reactor is located at _____.

a. Kalpakkam

 b. Koodankulam

c. Mumbai   d. Rajasthan

48. 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

7. ATOMS AND MOLECULES

49. Which of the following has the smallest mass?

 a) 6.023 × 1023 atoms of He

 b) 1 atom of He

c) 2 g of He

d) 1 mole atoms of He

50. Which of the following is a triatomic molecule?

a) Glucose

b) Helium

c) Carbon dioxide

d) Hydrogen

51. 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

52. Mass of 1 mole of Nitrogen atom is

 a) 28 amu b) 14 amu c) 28 g

 d) 14 g

53. Which of the following represents 1 amu?

a) Mass of a C - 12 atom

b) Mass of a hydrogen atom

c) 1/12th of the mass of a C – 12 atom

d) Mass of O – 16 atom

SCIENCE

54. 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.

55. 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

56. In the nucleus of $_{20}Ca^{40}$, there are

a) 20 protons and 40 neutrons

b) 20 protons and 20 neutrons

c) 20 protons and 40 electrons

d) 40 protons and 20 electrons

57. The gram molecular mass of oxygen molecule is

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

58. 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}

8. PERIODIC CLASSIFICATION OF ELEMENTS

59. The number of periods and groups in the periodic table are _____.

a) 6,16   b) 7,17

c) 8,18   d) 7,18

60. The basis of modern periodic law is _____.

a) atomic number

b) atomic mass

c) isotopic mass

d) number of neutrons

61. _____ group contains the member of halogen family.

a) 17th   b) 15th   c) 18th

d) 16th

62. _____ is a relative periodic property.

a) Atomic radii

b) Ionic radii

c) Electron affinity

d) Electronegativity

63. Chemical formula of rust is _____.

a) $FeO.xH_2O$ b) $FeO_4.xH_2O$

c) $Fe_2O_3.xH_2O$ d) FeO

64. In the alumino thermic process the role of Al is _____.

a) oxidising agent

b) reducing agent

c) hydrogenating agent

d) sulphurising agent

65. The process of coating the surface of metal with a thin layer of zinc is called _____.

a) painting

SCIENCE

b) thinning

c) galvanization

d) electroplating

66. Which of the following have inert gases 2 electrons in the outermost shell.

a) He   b) Ne   c) Ar   d) Kr

67. Neon shows zero electron affinity due to _____.

 a) Stable arrangement of neutrons

b) Stable configuration of electrons

c) Reduced size

d) Increased density

68. _____ is an important metal to form amalgam.

a) Ag   b) Hg   c) Mg   d) Al

9. SOLUTIONS

69. A solution is a _____ mixture.

 a) homogeneous

 b) heterogeneous

c) homogeneous and heterogeneous

 d) non homogeneous

70. The number of components in a binary solution is _____.

a) 2   b) 3   c) 4   d) 5

71. Which of the following is the universal solvent?

a) Acetone b) Benzene c) Water

 d) Alcohol

72. 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

73. Identify the non aqueous solution.

a) sodium chloride in water

b) glucose in water

c) copper sulphate in water

d) sulphur in carbon–di–sulphide

74. When pressure is increased at constant temperature the solubility of gases in liquid _____.

a) No change   b) increases

c) decreases   d) no reaction

75. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____.

a) 12g b) 11g c) 16g d) 20g

76. A 25% alcohol solution means;

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

77. Deliquescence is due to _____.

a) Strong affinity to water

b) Less affinity to water

c) Strong hatred to water

d) Inertness to water

78. Which of the following is hygroscopic in nature?

a) ferric chloride

b) copper sulphate penta hydrate

c) silica gel

d) none of the above

10. TYPES OF CHEMICAL REACTIONS

79. $H_2(g) + Cl_2(g) \rightarrow 2HCl(g)$ is a

a) Decomposition Reaction

b) Combination Reaction

c) Single Displacement Reaction

d) Double Displacement Reaction

80. Photolysis is a decomposition reaction caused by _____.

a) heat b) electricity c) light d) mechanical energy

81. A reaction between carbon and oxygen is represented by

$C(s) + O_2(g) \rightarrow CO_2(g) + Heat.$

In which of the type(s), the above reaction can be classified?

i) Combination Reaction

ii) Combustion Reaction

iii) Decomposition Reaction

iv) Irreversible Reaction

a) i and ii   b) i and iv

c) i, ii and iii   d) i, ii and iv

82. The chemical equation

$Na_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s)$
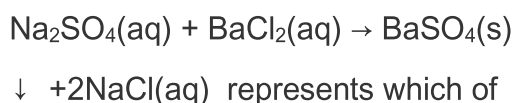
$\downarrow$ +2NaCl(aq) represents which of the following types of reaction?

a) Neutralisation   b) Combustion

c) Precipitation   d) Single displacement

83. 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

84. A single displacement reaction is represented by $X(s) + 2HCl (aq) \rightarrow XCl_2(aq) + H_2(g)$. Which of the following(s) could be X. i) Zn ii) Ag iii) Cu iv) Mg Choose the best pair.

a) i and ii   b) ii and iii

c) iii and iv   d) i and iv

85. Which of the following is not an " element + element → compound" type reaction?

a) $C (s) + O_2(g) \rightarrow CO_2(g)$

b) $2K(s) + Br_2(l) \rightarrow 2KBr(s)$

c) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

d) $4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(s)$

86. 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) $A(aq) + B(s) \rightarrow C(aq) + D(l)$

87. The pH of a solution is 3. Its $[OH^-]$ concentration is

a) 1×10^{-3} M   b) 3 M

c) 1×10^{-11} M   d) 11 M

88. 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

11. CARBON AND ITS COMPOUNDS

89. 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

90. 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

91. The secondary suffix used in IUPAC nomenclature of an aldehyde is _____.

a) – ol   b) – oic acid   c) – al

d) – one

92. 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

93. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a _____.

a) Reduction of ethanol

b) Combustion of ethanol

c) Oxidation of ethanoic acid

d) Oxidation of ethanol

94. Rectified spirit is an aqueous solution which contains about _____ of ethanol.

a) 95.5% b) 75.5% c) 55.5% d) 45.5%

95. Which of the following are used as anaesthetics?

a) Carboxylic acids   b) Ethers

c) Esters   d) Aldehydes

96. TFM in soaps represents _____ content in soap.

a) mineral

b) vitamin

c) fatty acid

d) carbohydrate

97. Which of the following statements 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 – $SO3^-Na^+$

d) It is effective even in hard water.

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

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

a) cortex b) pith c) pericycle

d) endodermis

99. The endarch condition is the characteristic feature of

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

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

 a) radial b) amphivasal c) conjoint

d) None of these

101. Which is formed during anaerobic respiration

a)Carbohydrate   b) Ethyl alcohol

c) Acetyl CoA   d) Pyruvate

 102. Kreb's cycle takes place in

a) chloroplast

b) mitochondrial matrix

c) stomata

d) inner mitochondrial membrane

 103. Oxygen is produced at what point during photosynthesis?

 a) when ATP is converted to ADP

 b) when CO2 is fixed

 c) when H2O is splitted

d) All of these

13 STRUCTURAL ORGANISATION OF ANIMALS

104. In leech locomotion is performed by

a) Anterior sucker

b) Paropodia

c) Setae

d) Contraction and relaxotion of muscles.

105. The segments of leech are known as

 a) Metameres (somites)

 b) Proglottids

 c) Strobila

 d) All the above

106. Pharyngeal ganglion in leech is a part of

a) Excretory system

b) Nervous system

c) Reproductive system

 d) Respiratory system

107. The brain of leech lies above the

a) Mouth

 b) Buccal Cavity

c) Pharynx

d) Crop

108. The body of leech has

a) 23 segments b) 33 segments

c) 38 segments d) 30 segments

109. Mammals are _____ animals.

a) Cold blooded

 b) Warm blooded

c) Poikilothermic

d) All the above

110. The animals which give birth to young ones are

a) Oviparous

b) Viviparous

 c) Ovoviviparous

d) All the above

SCIENCE

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

111. 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

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

a) Cortex   b) Epidermis

c) Phloem   d) Xylem

113. During transpiration there is loss of

a) Carbon di oxide   b) Oxygen

c) Water   d) None of the above

114. Root hairs are

a) Cortical cell

b) Projection of epidermal cell

c) Unicellular

d) Both b and c

115. Which of the following process requires energy?

a) Active transport

b) Diffusion

c) Osmosis

d) All of them

116. The wall of human heart is made up of

a) Endocardium   b) Epicardium

c) Myocardium   d) All of the above

117. Which is the sequence of correct blood flow

a) Ventricle – atrium – vein – arteries

b) Atrium – ventricle – veins – arteries

c) Atrium – ventricle – arteries – veins

d) Ventricles – vein – atrium – arteries

118. A patient with blood group O was injured in an accident and has blood loss. Which blood group the doctor should effectively use for transfusion in this condition?

a) O group

b) AB group

c) A or B group

d) All blood group

119. 'Heart of heart' is called

a) SA node

b) AV node

c) Purkinje fibres

d) Bundle of His

120. Which one of the following regarding blood composition is correct

a) Plasma – Blood + Lymphocytes

b) Serum – Blood + Fibrinogen

c) Lymph – Plasma + RBC + WBC

d) Blood – Plasma + RBC + WBC + Platelets

SCIENCE

15. NERVOUS SYSTEM

121. Bipolar neurons are found in

a) retina of eye

b) cerebral cortex

c) embryo

d) respiratory epithelium

122. Site for processing of vision, hearing, memory, speech, intelligence and thought is

a) kidney

b) ear

c) brain

d) lungs

123. 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

124. 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

125. The outer most of the three cranial meninges is

a) arachnoid membrane

b) piamater   c) duramater

d) myelin sheath

126. There are pairs of cranial nerves and pairs of spinal nerves.

a) 12, 31   b) 31, 12

c) 12, 13   d) 12, 21

127. 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

128. Which nervous band connects the two cerebral hemispheres of brain?

a) thalamus

b) hypothalamus

c) corpus callosum

d) pons

129. Node of Ranvier is found in

a) muscles   b) axons

c) dendrites   d) cyton

130. Vomiting centre is located in

a) medulla oblongata

b) stomach

c) cerebrum

d) hypothalamus

131. Nerve cells do not possess

a) neurilemma

b) sarcolemma

c) axon

d) dendrites

132. 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

16. PLANT AND ANIMAL HORMONES

133. Gibberellins cause:

a) Shortening of genetically tall plants

b) Elongation of dwarf plants

c) Promotion of rooting

d) Yellowing of young leaves

134. The hormone which has positive effect on apical dominance is:

a) Cytokinin b) Auxin   c) Gibberellin

d) Ethylene

135. Which one of the following hormones is naturally not found in plants?

a) 2, 4–D   b) GA 3   c) Gibberellin

d) IAA

136. Avena coleoptiles est was conducted by

a) Darwin   b) N. Smit

c) Paal   d) F.W. Went

137. To increase the sugar production in sugarcanes they are sprayed with _____

a) Auxin   b) Cytokinin

c) Gibberellins   d) Ethylene

138. LH is secreted by

a) Adrenal gland

b) Thyroid gland

c) Anterior pituitary

d) Hypothalamus

139. Identify the exocrine gland

a) Pituitary gland

b) Adrenal gland

c) Salivary gland

d) Thyroid gland

140. Which organ acts as both exocrine gland as well as endocrine gland

a) Pancreas b) Kidney c) Liver

d) Lungs

141. Which one is referred as " Master Gland"?

a) Pineal galnd   b) Pituitary gland

c) Thyroid gland   d) Adrenal gland

17. REPRODUCTION IN PLANTS AND ANIMALS

142. The plant which propagates with the help of its leaves is _____.

a) Onion   b) Neem

c) Ginger   d) Bryophyllum

143. Asexual reproduction takes place through budding in _____.

a) Amoeba   b) Yeast

c) Plasmodium   d) Bacteria

144. Syngamy results in the formation of _____.

a) Zoospores b) Conidia c) Zygote

d) Chlamydospores

145. The essential parts of a flower are _____.

a) Calyx and Corolla

b) Calyx and Androecium

c) Corolla and Gynoecium

d) Androecium and Gynoecium

SCIENCE

146. Anemophilous flowers have _____.

a) Sessile stigma

b) Small smooth stigma

c) Colored flower

d) Large feathery stigma

147. Male gametes in angiosperms are formed by the division of _____.

a) Generative cell

b) Vegetative cell

c) Microspore mother cell

d) Microspore

148. 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

149. 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

150. The large elongated cells that provide nutrition to developing sperms are

a) Primary germ cells

b) Sertoli cells

c) Leydig cells

d) Spermatogonia

151. Estrogen is secreted by

a) Anterior pituitary

b) Primary follicle

c) Graffian follicle

d) Corpus luteum

152. Which one of the following is an IUCD?

a) Copper – T   b) Oral pills

c) Diaphragm   d) Tubectomy

18. GENETICS

153. According to Mendel alleles have the following character

a) Pair of genes

b) Responsible for character

c) Production of gametes

d) Recessive factors

154. 9 : 3 : 3 : 1 ratio is due to

a) Segregation

b) Crossing over

c) Independent assortment

d) Recessiveness

155. The region of the chromosome where the spindle fibres get attached during cell division

a) Chromomere

b) Centrosome

c) Centromere

d) Chromonema

156. The centromere is found at the centre of the _____ chromosome.

a) Telocentric

b) Metacentric

c) Sub-metacentric

d) Acrocentric

SCIENCE

157. The _____ units form the backbone of the DNA.

a) 5 carbon sugar   b) Phosphate

c) Nitrogenous bases   d) Sugar phosphate

158. Okasaki fragments are joined together by _____.

a) Helicase

b) DNA polymerase

c) RNA primer

d) DNA ligase

159. 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

160. The loss of one or more chromosome in a ploidy is called _____.

a) Tetraploidy   b) Aneuploidy

c) Euploidy   d) polyploidy

19. ORIGIN AND EVOLUTION OF LIFE

161. Biogenetic law states that _____

a) Ontogeny and phylogeny go together

b) Ontogeny recapitulates phylogeny

c) Phylogeny recapitulates ontogeny

d) There is no relationship between phylogeny and ontogeny

162. The 'use and disuse theory' was proposed by _____.

a) Charles Darwin

b) Ernst Haeckel

c) Jean Baptiste Lamarck

d) Gregor Mendel

163. Palaeontologist deal with

a) Embryological evidences

b) Fossil evidences

c) Vestigial organ evidences

d) All the above

164. The best way of direct dating fossils of recent origin is by

a) Radio–carbon method

b) Uranium lead method

c) Potassium–argon method

d) Both (a) and (c)

165. The term Ethnobotany was coined by

a) Khorana

b) J.W. Harsbberger

c) Ronald Ross

d) Hugo de Vries

20. BREEDING AND BIOTECHNOLOGY

166. Which method of crop improvement can be practised by a farmer if he is inexperienced?

a) clonal selection

b) mass selection

SCIENCE

c) pureline selection

d) hybridisation

167. Pusa Komal is a disease resistant variety of _____.

a) sugarcane   b) rice c) cow pea

d) maize

168. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of _____.

a) chilli   b) maize

c) sugarcane   d) wheat

169. 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

170. 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)

171. We can cut the DNA with the help of

a) scissors

b) restriction endonucleases

c) knife

d) RNAase

172. rDNA is a

a) vector DNA

b) circular DNA

c) recombinant of vector DNA and desired DNA

d) satellite DNA

173. DNA fingerprinting is based on the principle of identifying _____ sequences of DNA

a) single stranded   b) mutated

c) polymorphic   d) repetitive

174. Organisms with modified endogenous gene or a foregin gene are also known as

a) transgenic organsims

b) genetically modified

c) mutated

d) both a and b

175. In a hexaploid wheat ($2n = 6 x = 42$) the haploid (n) and the basic(x) number of chromosomes 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

21. HEALTH AND DISEASES

176. Tobacco consumption is known to stimulate secretion of adrenaline. The component causing this could be

a) Nicotine   b) Tannic acid

c) Curcumin   d) heptin

177. World 'No Tobacco Day' is observed on

a) May 31   b) June 6

c) April 22   d) October 2

178. Cancer cells are more easily damaged by radiations than normal cells because they are

 a) Different in structure

 b) Non dividing

 c) Starved mutation

 d) Undergoing rapid division

179. Which type of cancer affects lymph nodes and spleen?

a) Carcinoma b) Sarcoma

c) Leukemia   d) Lymphoma

180. Excessive consumption of alcohol leads to

a) Loss of memory

b) Cirrhosis of liver

c) State of hallucination

d) Supression of brain

181. 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

182. Cancer of the epithelial cells is called

 a) Leukemia   b) Sarcoma

 c) Carcinoma   d) Lipoma

183. Metastasis isassociated with

a) Malignant tumour

 b) Benign tumour

c) Both (a) and (b)

d) Crown gall tumour

184. Polyphagia is a condition seen in

a) Obesity

b) Diabetes mellitus

c) Diabetes insipidus

d) AIDS

185. Where does alcohol effect immediately after drinking?

a) Eyes   b) Auditory region

c) Liver   d) Central nervous system

22. ENVIRONMENTAL MANAGEMENT

186. 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

187. 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

188. 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

189. Soil erosion can be prevented by

a) deforestation   b) afforestation

c) over grazing   d) removal of vegetation

190. A renewable source of energy is

a) petroleum   b) coal

c) nuclear fuel   d) trees

191. Soil erosion is more where there is

a) no rain fall

b) low rainfall

c) rain fall is high

d) none of these

192. An inexhaustible resources is

a) wind power

b) soil fertility

c) wild life

d) all of the above

193. Common energy source in village is

a) electricity   b) coal   c) biogas

d) wood and animal dung

194. Green house effect refers to

a) cooling of earth

b) trapping of UV rays

c) cultivation of plants

d) warming of earth

195. A cheap, conventional, commercial and inexhaustible source of energy is

a) hydropower

b) solar energy

c) wind energy

d) thermal energy

196. Global warming will cause

a) raise in level of oceans

b) melting of glaciers

c) sinking of islands

d) all of these

197. 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.

23. VISUAL COMMUNICATION

198. Which software is used to create animation ?

a) Paint b) PDF c) MS Word

d) Scratch

199. All files are stored in the _____.

a) Folder b) box   c) Pai

d) scanner

200. Which is used to build scripts?

a) Script area

b) Block palette

c) stage

d) sprite

201. Which is used to edit programs?

a) Inkscape   b) script editor

c) stage   d) sprite

202. Where you will create category of blocks?

a) Block palette   b) Block menu

c) Script area   d) sprite

Answers

1. c) mass of the object
2. c) change of momentum
3. c) both (a) & (b)
4. c) Force
5. c) cycling
6. b) NKg^{-1}
7. c) 98 × 10^4 dyne
8. d) M
9. d) increase by 300%
10. d) both a and c
11. a) A
12. b) 2f
13. c) a parallel beam of light
14. c) either positive or negative
15. b) infinity
16. c) –0.25 m
17. c) in front of the retina
18. d) Bi focal lenses
19. a) A convex lens of focal length 5 cm
20. c) VB < VG < VR
21. d) 8.31 mol^{-1}K^{-1}
22. c) zero
23. c) both (a) and (b)
24. c) difference in T.E. and P.E
25. a) A ← B, A ← C, B ← C
26. b) Rate of change of charge is current
27. c) Ohm
28. b) closing the switch completes the circuit
29. c) electrical energy

30. a) vibrate along the direction of the wave motion
31. a) 330 ms^{-1}
32. b) 20 kHz
33. c) 330 ×√2 ms^{-1}
34. c) 0.02752 m
35. d) none of these
36. c) 25 m
37. d) a & c
38. d) all the above
39. b) Irene Curie
40. b) (ii) and (iii) are correct
41. b) Radio Cobalt
42. c) it produces genetic disorder
43. c) Lead
44. d) (iii) & (iv) are correct
45. c) Nuclear fusion
46. b) 8, 4
47. a) Kalpakkam
48. b) (i) & (ii) are correct
49. b) 1 atom of He
50. c) Carbon dioxide
51. b) 2.24 litre
52. d) 14 g
53. c) 1/12th of the mass of C-12 atom
54. c) One mole of hydrogen gas contains Avogadro's number of atoms.
55. c) 22.4 litre
56. b) 20 protons and 20 neutrons
57. c) 32 g
58. (a) 6.023 × 10^{23}
59. d) 7,18
60. a) atomic number
61. a) 17th

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62. d) Electronegativity

63. c) $Fe_2O_3.xH_2O$

64. b) reducing agent

65. c) galvanization

66. a) He

67. b) Stable configuration of electrons

68. b) Hg

69. a) homogeneous

70. a) 2

71. c) Water

72. a) Saturated solution

73. d) sulphur in carbon–di–sulphide

74. b) increases

75. b) 11g

76. c) 25 ml alcohol in 75 ml of water

77. a) Strong affinity to water

78. c) silica gel

79. b) Combination Reaction

80. c) light

81. d) i, ii and iv

82. c) Precipitation

83. a) i, ii and iii

84. d) i and iv

85. c) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

86. c) $A(aq) + B(aq) \rightarrow C(s) + D(aq)$

87. c) 1×10^{-11} M

88. a) large surface area

89. b) alkene

90. d) Alcohol

91. c) – al

92. a) C_3H_8 and C_4H_{10}

93. b) Combustion of ethanol

94. a) 95.5%

95. b) Ethers

96. c) fatty acid

97. a) It is a sodium salt of long chain fatty acids

98. d) Endodermis

99. b) Stem

100. c) Conjoint

101. b) Ethyl alcohol

102. b) Mitochondrial matrix

103. c) When H_2O is splitted

104. a) Anterior sucker (or) b) Posterior sucker
    d) Constraction and relaxation of muscles

105. a) Metameres (somites)

106. b) Nervous system

107. c) Pharynx

108. b) 33 segments

109. b) Warm blooded

110. b) Viviparous

111. d) All of the ab ve

112. d) Xylem

113. c) Water

114. d) Both b and c

115. a) Active transport

116. d) All of the above

117. c) Atrium – Ventricle – Arteries – Vein

118. a) O g oup

119. a) SA node

121. a) Retina of eye

122. c) Brain

123. d) Receptor, spinal cord, muscle

124. b) Towards, away from

125. c) Duramater

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126. a) 12, 31

127. c) Efferent neuron

128. c) Corpus callosum

129. b) Axons

130. a) Medulla oblongata

131. b) Sarcolemma

132. d) Hypothalamus

133. b) Elongation of dwarf plants

134. b) Auxin

135. a) 2, 4–D

136. d) F.W. Went

137. d) Ethylene

138. c) Anterior pituitary

139. c) Salivary gland

140. a) Pancreas

141. b) Pituitary gland

142. d) Bryophyllum

143. b) Yeast

144. c) Zygote

145. d) Androecium and Gynoecium

146. d) Large feathery stigma

147. a) Generative cell

148. d) They are formed from gonads

149. a) Epididymis

150. b) Sertoli cells

151. c) Graffian follicle

152. a) Copper – T

153. b) Responsible for character

154. c) Independent assortment

155. c) Centromere

156. b) Metacentric

157. d) Sugar phosphate

158. d) DNA ligase

159. a) 22 pairs of autosomes and 1 pair of allosomes.

160. b) Aneuploidy

161. b) Ontogeny recapitulates phylogeny

162. c) Jean Baptiste Lamarck

163. b) Fossil evidences

164. a) Radio–carbon method

165. b) J.W. Harsbberger

166. b) Mass selection

167. c) Cow pea

168. d) Wheat

169. a) IR 8

170. d) both (a) and (b)

171. b) Restriction endonucleases

172. c) Recombinant of vector DNA and desired DNA

173. d) Repititive

174. d) Both a and b

175. d) n = 21 and x = 7

176. a) Nicotine

177. a) May31

178. d) Undergoing rapid division

179. c) Lymphoma

180. b) Cirrhosis of liver

181. d) Insufficient blood supply to heart muscles

182. c) Carcinoma

183. a) Malignant tumour

184. b) Diabetes mellitus

185. d) Central nervous system

186. c) ii and iii

187. d) All of the above

188. d) i, ii and iii

189. b) Afforestation

190. d) trees

191. c) rain fall is high

192. a) Wind Power

193. d) wood and animal dung

194. d) warming of earth

195. a) hydropower

196. d) all of these

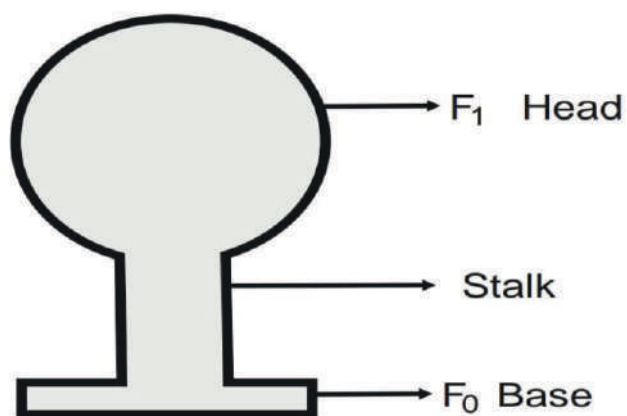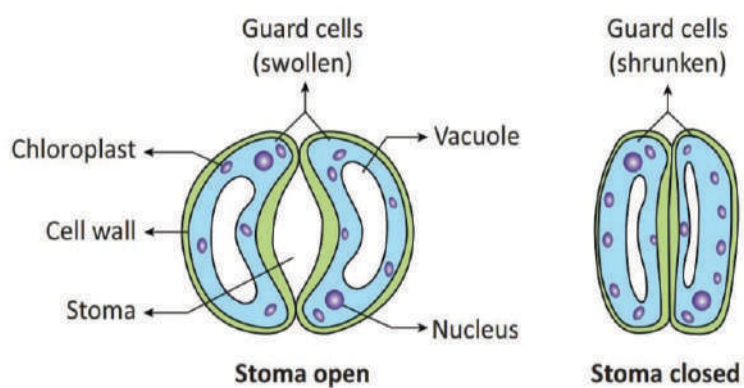197. b) the blades of wind mill are operated with the help of electric motor
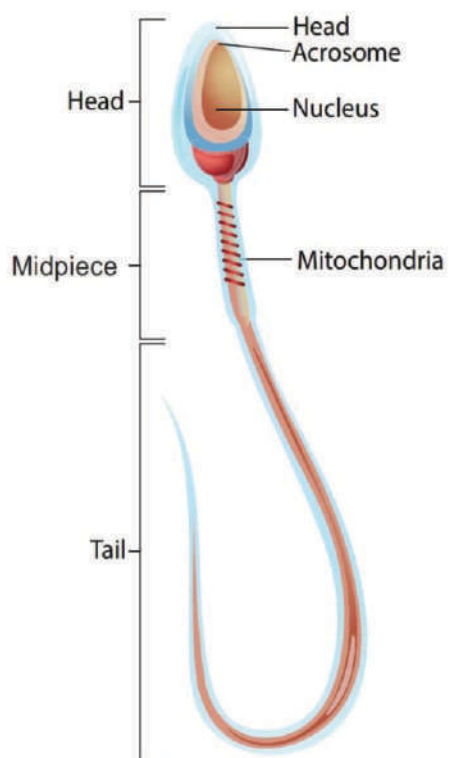
198. d) Scratch

199. a) Folder

200. a) Script area

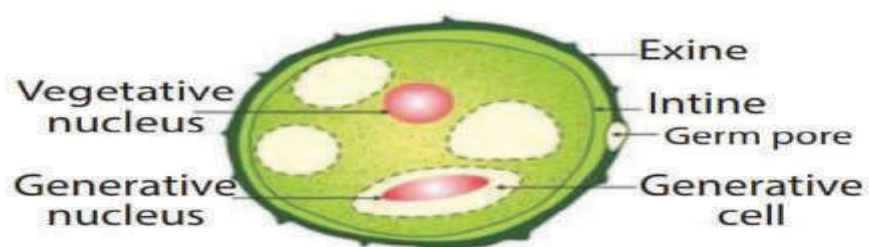201. b) Script editor

202. b) Block menu

SOME IMPORTANT SCIENCE DIAGRAMS

1. **OXYSOMES.**

Figure 12.11 Structure of Oxysomes

2. **GUARD CELL**

Figure. 14.7 Guard cell in turgid and flaccid condition

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3. SPERM CELL

Figure 17.15 Structure of sperm
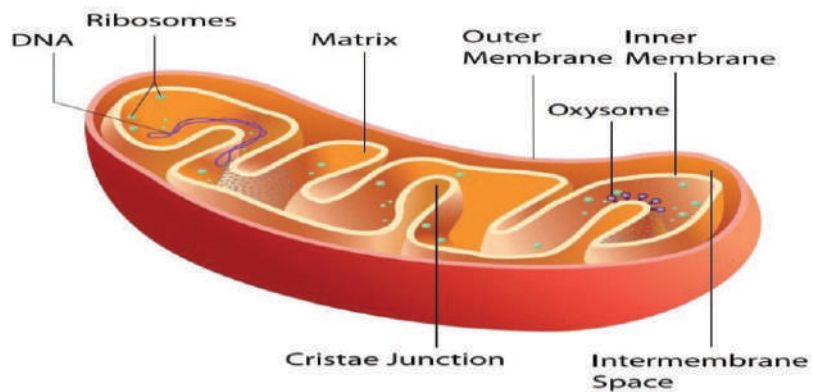
4. POLLEN GRAIN

Pollen Grain

5. ADRENAL GLAND
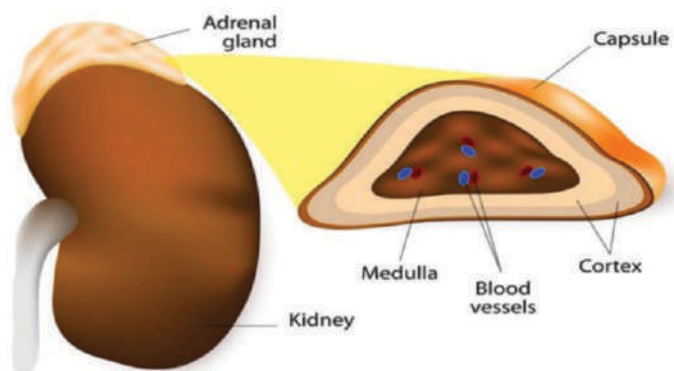
Figure 16.11 Adrenal Gland
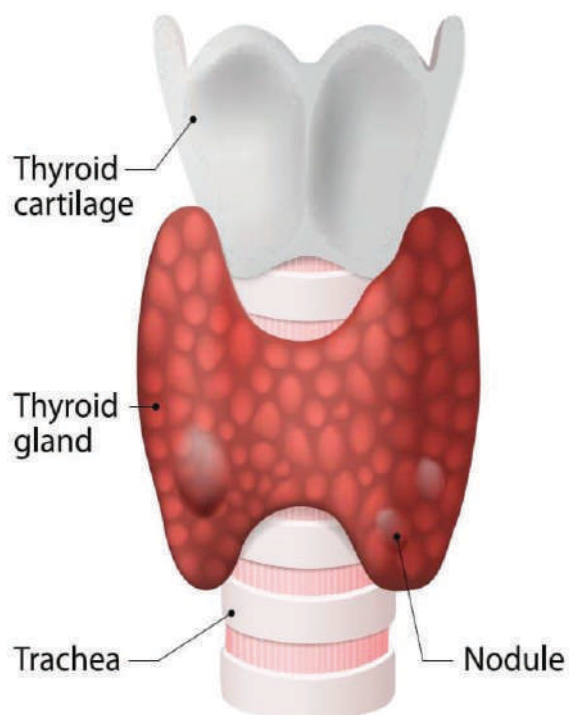
6. PANCREAS
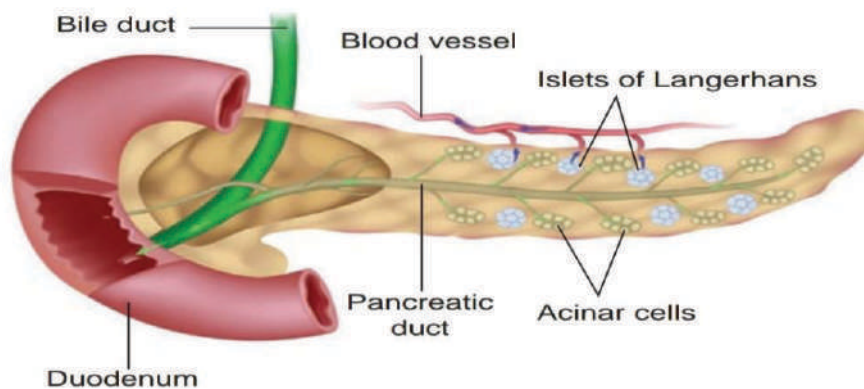
Figure 16.10 Pancreas

7. MITOCHONDRIA

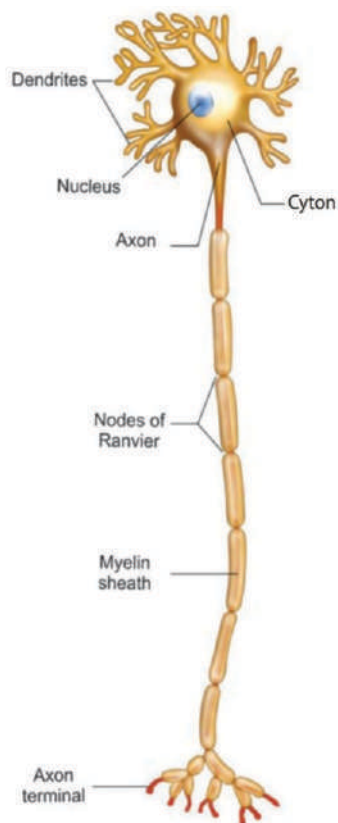**Figure 12.10** Structure of Mitochondria

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8. CHLOROPLAST

Figure 12.8 Ultrastructure of Chloroplast
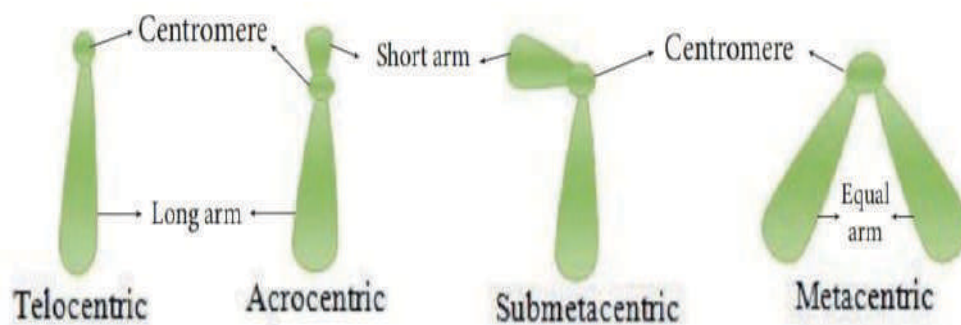
9. THYROID GLAND

Figure 16.8 Thyroid Gland

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10. NEURON DIAGRAM
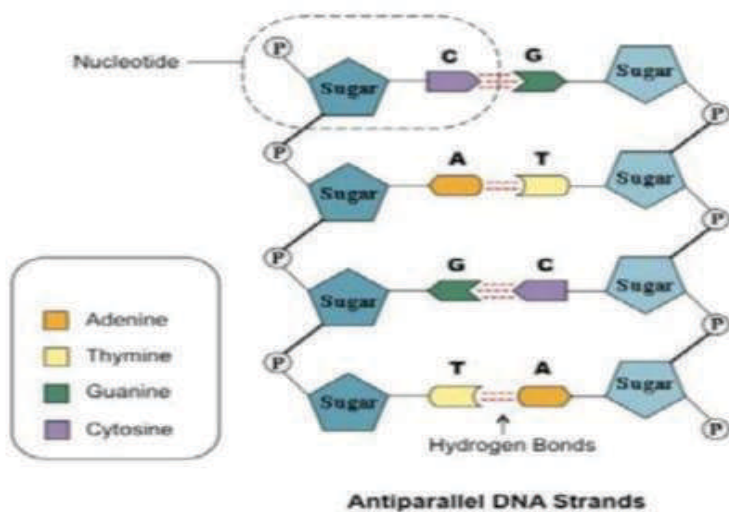

Fig. 15.1 **Structure of Neuron**

11. TYPES OF CHROMOSOMES

Figure 18.4 Types of chromosomes based on position of centromere

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12. STRUCTURE OF DNA

Figure 18.7 Nucleotides in a DNA