

CAREERS 360
PRACTICE Series

Bihar Board Class 10

**Science
Answer Key 2025
(All Sets)**

Multiple Choice Question

1. A horizontal magnet hanging freely in air always comes to rest in

- (A) Any direction
- (B) East-West direction
- (C) North-South direction
- (D) None of these

Solution:

Correct Answer: (C) North-South direction

Explanation: A freely suspended magnet aligns itself in the Earth's magnetic field and comes to rest along the North-South direction due to the Earth's geomagnetic field.

2. If a compass is placed near a wire carrying electric current, the the compass needle

- (A) Will be deflected
- (B) The current carrying wire will be deflected
- (C) Will not be deflected
- (D) None of these

Solution:

Correct Answer: (A) Will be deflected

Explanation: A current-carrying wire generates a magnetic field around it, which interacts with the magnetic field of the compass needle, causing it to deflect.

3. Faraday made many revolutionary discoveries, including

- (A) Electromagnetic induction
- (B) Law of electrolysis
- (C) Both (A) and (B)
- (D) None of these

Solution:

Correct Answer: (C) Both (A) and (B)

Explanation: Michael Faraday discovered electromagnetic induction, which is the generation of electric current due to changing magnetic fields, and also formulated the laws of electrolysis related to the chemical effects of electric current.

4. An electric motor converts

- (A) Chemical energy into electrical energy
- (B) Electrical energy into mechanical energy
- (C) Mechanical energy into electrical energy
- (D) Electrical energy into chemical energy

Solution:

Correct Answer: (B) Electrical energy into mechanical energy

Explanation: An electric motor works on the principle of electromagnetic force, converting electrical energy into mechanical energy to drive machinery.

5. In Fleming's left-hand rule, the index finger of the left hand indicates
(A) Direction of magnetic field
(B) Direction of electric force applied on the conductor
(C) Direction of electric current flowing in the conductor
(D) None of these

Solution:

Correct Answer: (A) Direction of magnetic field

Explanation: In Fleming's Left-Hand Rule, the index finger represents the magnetic field direction, the middle finger represents current direction, and the thumb represents force (motion).

6. When electric current flows through a conducting wire, what type of magnetic field is generated above and below the wire?
(A) Opposite type
(B) Similar type
(C) Not of any kind
(D) None of these

Solution:

Correct Answer: (A) Opposite type

Explanation: According to Ampere's Right-Hand Rule, the magnetic field lines around a current-carrying conductor form circular loops in opposite directions above and below the wire.

7. What type of energy source is hydroelectric energy?
(A) Renewable
(B) Non-renewable
(C) Both (A) and (B)
(D) None of these

Solution:

Correct Answer: (A) Renewable

Explanation: Hydroelectric energy is a renewable energy source because it uses the natural water cycle (flowing water) to generate electricity without depleting resources.

8. Which gas is responsible for global warming?
(A) Nitrogen
(B) Carbon dioxide
(C) Oxygen
(D) None of these

Solution:

Correct Answer: (B) Carbon dioxide

Explanation: Carbon dioxide (CO₂) is a major greenhouse gas that traps heat in the Earth's atmosphere, contributing to global warming.

9. Bile juice is secreted by
(A) Oral cavity
(B) Liver
(C) Small intestine
(D) Stomach

Solution:

Correct Answer: (B) Liver

Explanation: Bile juice is produced by the liver and stored in the gallbladder. It helps in the digestion and emulsification of fats.

10. What is the function of the villi located in small intestine?

- (A) Blocking absorption
- (B) Reducing the surface area of absorption
- (C) Increasing the surface area of absorption
- (D) None of these

Solution:

Correct Answer: (C) Increasing the surface area of absorption

Explanation: Villi are small finger-like projections in the small intestine that increase the surface area for efficient absorption of nutrients from digested food.

11. The posterior part of the oral cavity is

- (A) Esophagus
- (B) Pharynx
- (C) Duodenum
- (D) Pancreas

Solution:

Correct Answer: (B) Pharynx

Explanation: The pharynx is the posterior part of the oral cavity that connects the mouth to the esophagus and also serves as a passageway for air to the larynx.

12. The transfer of O₂ from outside environment to cells and removal CO₂ is referred to as

- (A) Exhalation
- (B) Respiration
- (C) Inhalation
- (D) None of these

Solution:

Correct Answer: (B) Respiration

Explanation: Respiration is the biological process where oxygen (O₂) is taken in from the environment and transported to cells, while carbon dioxide (CO₂) is expelled as a byproduct of metabolism.

13. The basic source of oxygen in photosynthesis is

- (A) Chlorophyll
- (B) CO₂
- (C) Water
- (D) Solar energy

Solution:

Correct Answer: (C) Water

Explanation: In photosynthesis, oxygen is released as a byproduct from the splitting of water

molecules (H_2O) during the light-dependent reactions.

14. Which of the following is known as the 'energy currency' of the cell?

- (A) ATP
- (B) ADP
- (C) DTP
- (D) None of these

Solution:

Correct Answer: (A) ATP

Explanation: Adenosine triphosphate (ATP) is known as the energy currency of the cell because it stores and provides energy for cellular processes.

15. Xylem in plant is responsible for

- (A) Carrying of food
- (B) Carrying of oxygen
- (C) Carrying of amino acid
- (D) Carrying of water

Solution:

Correct Answer: (D) Carrying of water

Explanation: Xylem is the vascular tissue in plants that transports water and minerals from the roots to the leaves.

16. Apart from plasma, which of the following is found in blood?

- (A) White Blood Cells (WBC)
- (B) Red Blood Cells (RBC)
- (C) Blood platelets
- (D) All of these

Solution:

Correct Answer: (D) All of these

Explanation: Apart from plasma, blood contains Red Blood Cells (RBCs) for oxygen transport, White Blood Cells (WBCs) for immunity, and platelets for blood clotting.

17. An aqueous solution of an acid conducts electricity because the acid dissolves in water

- (A) gets ionized
- (B) is soluble
- (C) is insoluble
- (D) none of these

Solution:

Correct Answer: (A) Gets ionized

Explanation: Acids ionize in water, releasing H^+ ions, which make the solution conductive. Strong acids ionize completely, while weak acids ionize partially.

18. Which of the following is not an olfactory indicator?

- (A) Clove oil
- (B) Vanilla

- (C) Sweet potato
- (D) All of these

Solution:

Correct Answer: (C) Sweet potato

Explanation: Olfactory indicators change smell in acidic or basic conditions. Clove oil and vanilla are olfactory indicators, but sweet potato is not.

19. Which acid is found in ant sting?

- (A) Citric acid
- (B) Acetic acid
- (C) Methanoic acid
- (D) None of these

Solution:

Correct Answer: (C) Methanoic acid

Explanation: Ant sting contains methanoic acid (formic acid), which causes irritation and pain when injected into the skin.

20. Which of the following is kept immersed in water?

- (A) White phosphorus
- (B) Red phosphorus
- (C) Iodine
- (D) Sulphur

Solution:

Correct Answer: (A) White phosphorus

Explanation: White phosphorus is highly reactive and catches fire in air, so it is kept immersed in water to prevent oxidation.

21. The substances, present as impurities in on ore, are called

- (A) Slag
- (B) Gangue
- (C) Mineral
- (D) None of these

Solution:

Correct Answer: (B) Gangue

Explanation: Gangue refers to unwanted impurities (like sand, clay, and rock) present in an ore that must be removed during extraction.

22. Which of the following metals can be easily cut with a knife?

- (A) Na
- (B) Cu
- (C) Ni
- (D) Al

Solution:

Correct Answer: (A) Na (Sodium)

Explanation: Sodium (Na) is a soft metal that can be easily cut with a knife due to its low density and weak metallic bonding.

23. Which metal is mixed with gold to make an alloy?

- (A) Fe
- (B) Cu
- (C) Zn
- (D) Ag

Solution:

Correct Answer: (B) Cu (Copper)

Explanation: Copper (Cu) is mixed with gold to form an alloy that increases its hardness and durability for making jewelry.

24. Silicon is a/an •

- (A) Non-metal
- (B) Metal
- (C) Alloy
- (D) Metalloid

Solution:

Correct Answer: (D) Metalloid

Explanation: Silicon (Si) is a metalloid, meaning it has properties of both metals and non-metals, and is widely used in semiconductors.

25. Double circulation is not found in

- (A) Frog
- (B) Fish
- (C) Bird
- (D) Human

Solution:

Correct Answer: (B) Fish

Explanation: Fish have a single circulation system, where blood flows through the heart only once per cycle, unlike mammals, birds, and amphibians that have double circulation.

26. From where does urea enter the blood?

- (A) Kidney
- (B) Lungs
- (C) Liver
- (D) None of these

Solution:

Correct Answer: (C) Liver

Explanation: Urea is produced in the liver as a result of protein metabolism and is then transported into the blood for excretion via the kidneys.

27. Where does glucose reabsorption occur?

- (A) In PCT
- (B) In DCT
- (C) In Henle's loop
- (D) All of these

Solution:

Correct Answer: (A) In PCT (Proximal Convoluted Tubule)

Explanation: Glucose reabsorption mainly occurs in the PCT (Proximal Convoluted Tubule) of the nephron in the kidneys to prevent its loss in urine.

28. The mechanism for removing harmful substances formed as a result of various activities from the body is called

- (A) Digestive system
- (B) Circulatory system
- (C) Excretory system
- (D) Nervous system

Solution:

Correct Answer: (C) Excretory system

Explanation: The excretory system removes harmful substances like urea, excess salts, and toxins from the body through urine and sweat.

29. What can happen due to spinal cord injury?

- (A) Goitre
- (B) Dwarfism
- (C) Diabetes
- (D) Paralysis

Solution:

Correct Answer: (D) Paralysis

Explanation: Spinal cord injury can disrupt nerve signals, leading to paralysis in different parts of the body depending on the injury location.

30. The largest gland in the human body is

- (A) Adrenal
- (B) Liver
- (C) Ovary
- (D) Pancreas

Solution:

Correct Answer: (B) Liver

Explanation: The liver is the largest gland in the human body, playing a key role in detoxification, digestion (bile secretion), and metabolism.

31. Plant hormone is called

- (A) Pheromone
- (B) Phytohormone

(C) Enzyme
(D) None of these

Solution:

Correct Answer: (B) Phytohormone

Explanation: Plant hormones, also known as phytohormones, regulate plant growth and development, examples include auxins, gibberellins, and cytokinins.

32. An example of vegetative propagation through leaves is

(A) Onion
(B) Potato
(C) Rose
(D) Bryophyllum

Solution:

Correct Answer: (D) Bryophyllum

Explanation: Bryophyllum reproduces by vegetative propagation through leaves, where small plantlets grow from the leaf margins and develop into new plants.

33. If the focal length of the lens is f and power is P then

(A) $f \div P = 0.5$
(B) $f \times P = 1$
(C) $P + f = 1$
(D) $P \div f = 2$

Solution:

Correct Answer: (B) $f \times P = 1$

Explanation: The relationship between focal length (f) and power (P) of a lens is given by $P = 1/f$, so $f \times P = 1$.

34. Which part of camera acts like the retina of the eye?

(A) Aperture
(B) Lens
(C) Film
(D) Shutter

Solution:

Correct Answer: (C) Film

Explanation: In a camera, the film (or sensor in digital cameras) acts like the retina of the human eye by capturing the image.

35. For a healthy human eye, the near point and far point are respectively

(A) 0 and infinity
(B) 25 cm and 250 cm
(C) 25 cm and infinity
(D) 0 and 25 cm

Solution:

Correct Answer: (C) 25 cm and infinity

Explanation: For a healthy human eye, the near point (closest distance for clear vision) is 25 cm, and the far point (farthest distance seen clearly) is infinity.

36. To an astronaut standing on the moon, the sky appears to be

- (A) Red
- (B) Blue
- (C) Black
- (D) White

Solution:

Correct Answer: (C) Black

Explanation: On the Moon, there is no atmosphere to scatter sunlight, so the sky appears black to an astronaut.

37. The decreased accommodative ability of the eye causes

- (A) Farsightedness
- (B) Presbyopia
- (C) Nearsightedness
- (D) Colourblindness

Solution:

Correct Answer: (B) Presbyopia

Explanation: Presbyopia is caused by the decreased accommodative ability of the eye due to aging, leading to difficulty in focusing on near objects.

38. The unit of resistivity in a conductor is

- (A) Ωm
- (B) Ω/m
- (C) Ω^{-1}
- (D) None of these

Solution:

Correct Answer: (A) Ωm (Ohm meter)

Explanation: The unit of resistivity in a conductor is Ohm meter (Ωm), given by $\rho = R \times A/L$ (where ρ is resistivity).

39. How many calories are there in 1 joule?

- (A) 0.23
- (B) 0.19
- (C) 0.21
- (D) 0.25

Solution:

Correct Answer: (A) 0.23

Explanation: 1 joule = 0.23 calories, which is a unit conversion between joules (J) and calories (cal) for energy.

40. The filament in an electric bulb is made of which of the following metals?

- (A) Iron
- (B) Aluminium
- (C) Tungsten
- (D) Copper

Solution:

Correct Answer: (C) Tungsten

Explanation: Tungsten is used in electric bulb filaments because it has a high melting point and resists high temperatures without melting.

41. The changes that occur during adolescence are called

- (A) Diversity
- (B) Germination
- (C) Puberty
- (D) None of these

Solution:

Correct Answer: (C) Puberty

Explanation: The physical and hormonal changes occurring during adolescence are called puberty, which includes growth spurts and reproductive maturity.

42. Which of the following is an effective measure used in family planning?

- (A) Diaphragm
- (B) Condom
- (C) Copper T and loop
- (D) All of these

Solution:

Correct Answer: (D) All of these

Explanation: Diaphragm, condoms, and Copper-T (IUDs) are effective contraceptive methods used in family planning to prevent pregnancy.

43. What is the meaning of atavism?

- (A) Inheritance of parental characteristics in progeny
- (B) No inheritance of parental characteristics in progeny
- (C) Inheritance of ancestral characteristics in progeny, which are not in parents
- (D) All of these

Solution:

Correct Answer: (C) Inheritance of ancestral characteristics in progeny, which are not in parents

Explanation: Atavism refers to the reappearance of ancestral traits in an organism that were absent in the immediate parents but present in distant ancestors.

44. The genetic structure of an organism is called

- (A) Phenotype
- (B) Genotype

- (C) Heredity
- (D) Diversity

Solution:

Correct Answer: (B) Genotype

Explanation: The genetic structure of an organism, including its genetic makeup, is called its genotype, while its physical expression is called phenotype.

45. The evolution of organisms by natural selection is called

- (A) Mendelism
- (B) Lamarckism
- (C) Micro-development
- (D) Darwinism

Solution:

Correct Answer: (D) Darwinism

Explanation: Darwinism refers to evolution by natural selection, a theory proposed by Charles Darwin, explaining how species evolve over time based on survival advantages.

46. The chemical which shows biomagnification is

- (A) CFC
- (B) ADP
- (C) ATP
- (D) DDT

Solution:

Correct Answer: (D) DDT

Explanation: DDT (Dichlorodiphenyltrichloroethane) is a pesticide that undergoes biomagnification, accumulating in higher concentrations as it moves up the food chain.

47. Primary consumers are called

- (A) Decomposer
- (B) Omnivorous
- (C) Carnivorous
- (D) Vegetarian

Solution:

Correct Answer: (D) Vegetarian

Explanation: Primary consumers are herbivores that feed directly on plants (producers), making them vegetarians in the ecological food chain.

48. CFC is widely used in

- (A) Jet engines
- (B) Refrigerators
- (C) Air conditioners
- (D) All of these

Solution:

Correct Answer: (D) All of these

Explanation: Chlorofluorocarbons (CFCs) are widely used in refrigerators, air conditioners, and jet engines, but they contribute to ozone layer depletion.

49. How many isomers of butane are possible?

- (A) 2
- (B) 3
- (C) 4
- (D) 5

Solution:

Correct Answer: (A) 2

Explanation: Butane (C_4H_{10}) has two isomers: **n**-butane (straight-chain) and iso-butane (branched-chain).

50. The shape of methane molecule is

- (A) Linear
- (B) Annular
- (C) Tetrahedral
- (D) Octahedral

Solution:

Correct Answer: (C) Tetrahedral

Explanation: Methane (CH_4) has a tetrahedral shape due to sp^3 hybridization, where the four hydrogen atoms are symmetrically arranged around the central carbon atom.

51. The valency of carbon in organic compounds is

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Solution:

Correct Answer: (D) 4

Explanation: Carbon has a valency of 4, meaning it forms four covalent bonds in organic compounds to satisfy the octet rule.

52. Which of the following is saturated hydrocarbon?

- (A) Alkane
- (B) Akene
- (C) Alkyne
- (D) None of these

Solution:

Correct Answer: (A) Alkane

Explanation: Alkanes are saturated hydrocarbons because they contain only single bonds (C-C), whereas alkenes and alkynes have double and triple bonds, respectively.

53. IUPAC name of ethylene is

- (A) Ethane
- (B) Ethyne
- (C) Ethene
- (D) None of these

Solution:

Correct Answer: (C) Ethene

Explanation: The IUPAC name of ethylene is ethene (C_2H_4), which belongs to the alkene group containing a double bond between carbon atoms.

54. Which was a defect of Mendeleev's periodic table?

- (A) Not giving proper place to oxygen
- (B) Not giving proper place to Cl
- (C) Not giving proper place to hydrogen
- (D) None of these

Solution:

Correct Answer: (C) Not giving proper place to hydrogen

Explanation: A major defect of Mendeleev's periodic table was the unclear placement of hydrogen, as it showed similarities with both alkali metals and halogens.

55. Who among the following propounded the laws of octave?

- (A) Mendeleev
- (B) Newlands
- (C) Lothen Meyer
- (D) Dobereiner

Solution:

Correct Answer: (B) Newlands

Explanation: John Newlands proposed the Law of Octaves, which stated that every eighth element had properties similar to the first when elements were arranged by increasing atomic mass.

56. Which of the following compounds would be the most basic?

- (A) SO_2
- (B) Na_2O
- (C) Al_2O_3
- (D) NO_2

Solution:

Correct Answer: (B) Na_2O (Sodium Oxide)

Explanation: Sodium oxide (Na_2O) is the most basic among the given compounds, as it forms a strongly basic solution ($NaOH$) in water.

57. A group of rays is called

- (A) Light beam
- (B) Ray beam

(C) Both (A) and (B)
(D) None of these

Solution:

Correct Answer: (A) Light beam

Explanation: A group of light rays traveling together is called a light beam, which can be parallel, convergent, or divergent.

58. The light rays travel in

(A) any direction
(B) oblique line
(C) a straight line
(D) none of these

Solution:

Correct Answer: (A) Light beam

Explanation: A group of light rays traveling together is called a light beam, which can be parallel, convergent, or divergent.

59. Which type of mirror is a concave mirror?

(A) Divergent
(B) Convergent
(C) Both convergent and divergent
(D) None of these

Solution:

Correct Answer: (B) Convergent

Explanation: A concave mirror is a converging mirror because it focuses parallel light rays to a single point, known as the focus.

60. Which of the following types of mirror is used in the headlight of a car?

(A) Convex mirror
(B) Concave mirror
(C) Plane mirror
(D) None of these

Solution:

Correct Answer: (B) Concave mirror

Explanation: Concave mirrors are used in car headlights as they focus the light rays into a powerful, parallel beam for better visibility.

61. The focal length of a concave mirror is

(A) Positive
(B) Negative
(C) both (A) and (B)
(D) . None of these

Solution:

Correct Answer: (B) Negative

Explanation: The focal length of a concave mirror is considered negative in the mirror formula ($1/f = 1/v - 1/u$) because the focus is on the same side as the object.

62. Which mirror always forms an image smaller than the object?

- (A) Concave
- (B) Plane
- (C) Convex
- (D) None of these

Solution:

Correct Answer: (C) Convex

Explanation: A convex mirror always forms an image that is smaller than the object, virtual, and erect, making it useful for rear-view mirrors in vehicles.

63. The speed of light in air as compared to vacuum is

- (A) Less
- (B) More
- (C) Same
- (D) None of these

Solution:

Correct Answer: (A) Less

Explanation: The speed of light in air is slightly less than in a vacuum because air molecules cause minimal obstruction, reducing the speed slightly.

64. Which phenomenon exhibited by light is demonstrated in the twinkling of stars?

- (A) Reflection
- (B) Dispersion
- (C) Scattering
- (D) Refraction

Solution:

Correct Answer: (D) Refraction

Explanation: The twinkling of stars is due to the refraction of light caused by atmospheric turbulence, which bends starlight and causes apparent brightness variations.

65. In which state is the Kalpakkam Nuclear Power Plant located?

- (A) Karnataka
- (B) Tamil Nadu
- (C) Uttar Pradesh
- (D) Gujarat

Solution:

Correct Answer: (B) Tamil Nadu

Explanation: The Kalpakkam Nuclear Power Plant is located in Tamil Nadu, India, and is one of India's major nuclear power stations.

66. The main component of domestic gas (LPG) is

- (A) Ethane
- (B) Propane
- (C) Butane
- (D) Methane

Solution:

Correct Answer: (C) Butane

Explanation: Liquefied Petroleum Gas (LPG) mainly consists of butane and propane, but butane is the dominant component used in domestic cooking gas.

67. The two non-renewable sources of energy are

- (A) Gobar gas and biomass
- (B) Coal and petroleum
- (C) Biomass and petroleum
- (D) None of these

Solution:

Correct Answer: (B) Coal and petroleum

Explanation: Coal and petroleum are non-renewable energy sources because they take millions of years to form and are being depleted faster than they are naturally replaced.

68. Which type of reaction is respiration?

- (A) Combination
- (B) Reduction
- (C) Endothermic
- (D) Oxidation

Solution:

Correct Answer: (D) Oxidation

Explanation: Respiration is an oxidation reaction where glucose ($C_6H_{12}O_6$) reacts with oxygen to form carbon dioxide, water, and energy (ATP).

69. Compounds formed by transfer of electrons are called

- (A) Organic.
- (B) Covalent
- (C) Electrovalent
- (D) None of these

Solution:

Correct Answer: (C) Electrovalent

Explanation: Compounds formed by the transfer of electrons between atoms are called electrovalent (ionic) compounds, such as NaCl (sodium chloride).

70. Which of the following reactions is an example of decomposition reaction?

- (A) $H_2 + I_2 \rightarrow 2HI$
- (B) $NH_4CNO \rightarrow H_2NCONH_2$

(C) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
(D) $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$

Solution:

Correct Answer: (D) $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$

Explanation: A decomposition reaction occurs when a single compound breaks down into two or more simpler substances. Here, potassium chlorate (KClO_3) decomposes into potassium chloride (KCl) and oxygen (O_2).

71. In which of the following is tartaric acid found?

(A) Orange
(B) Tamarind
(C) Tomato
(D) Vinegar

Solution:

Correct Answer: (B) Tamarind

Explanation: Tartaric acid is found in tamarind, grapes, and bananas and gives a sour taste to these fruits.

72. What is the chemical name of slaked lime?

(A) Calcium oxychloride.
(B) Calcium chloride
(C) Calcium oxide
(D) Calcium hydroxide

Solution:

Correct Answer: (D) Calcium hydroxide

Explanation: Slaked lime is the common name for calcium hydroxide ($\text{Ca}(\text{OH})_2$), which is used in whitewashing and as a mild base.

73. Magnesium is a member of which group of the periodic table?

(A) Group VIII
(B) Group I
(C) Group II
(D) Nonmetallic element

Solution:

Correct Answer: (C) Group II

Explanation: Magnesium (Mg) is a member of Group II (Alkaline Earth Metals) in the periodic table and is known for its reactivity and biological importance.

74. How many periods are there in the periodic table?

(A) 12
(B) 9

- (C) 8
- (D) 7

Solution:

Correct Answer: (D) 7

Explanation: The modern periodic table consists of 7 periods (horizontal rows), each representing elements with the same number of electron shells.

75. Which of the following is not an ancient method of water harvesting?

- (A) Katta
- (B) Kulh
- (C) Dug well
- (D) Irish

Solution:

Correct Answer: (D) Irish

Explanation: Irish is not an ancient Indian water harvesting method. Traditional methods like Katta (Maharashtra), Kulh (Himachal Pradesh), and Dug wells were used for water conservation in different regions.

76. What was the objective of construction of Tehri Dam?

- (A) Electricity generation
- (B) Land irrigation
- (C) Water supply
- (D) All of these

Solution:

Correct Answer: (D) All of these

Explanation: The Tehri Dam, built on the Bhagirathi River, was constructed for electricity generation, land irrigation, and water supply to nearby regions.

77. What is the new concept of waste management?

- (A) Reuse
- (B) Recycle
- (C) Reduce
- (D) All of these

Solution:

Correct Answer: (D) All of these

Explanation: The new concept of waste management follows the 3R principle: Reduce, Reuse, and Recycle, which helps in minimizing waste and promoting sustainability.

78. Which of the following is a renewable resource?

- (A) Coal
- (B) Forest
- (C) Petroleum
- (D) None of these

Solution:

Correct Answer: (B) Forest

Explanation: Forests are a renewable resource as they can be replenished through natural growth and sustainable management, whereas coal and petroleum are non-renewable.

79. Which of the following is the main component of biogas?

- (A) Carbon dioxide
- (B) Hydrogen sulphide
- (C) Water vapour
- (D) Methane

Solution:

Correct Answer: (D) Methane

Explanation: Biogas mainly consists of methane (CH_4), which is produced during the anaerobic decomposition of organic matter in biogas plants.

80. Peptic ulcer can be caused by

- (A) Eating less food
- (B) Eating normal food
- (C) Prolonged starvation
- (D) None of these

Solution:

Correct Answer: (C) Prolonged starvation

Explanation: Peptic ulcers can be caused by prolonged starvation, as excess stomach acid, in the absence of food, can damage the stomach lining. *Helicobacter pylori* infection and excessive NSAID use are also major causes.

Short Answer Type Questions (Physics)

1. Why do planets not twinkle? Explain.

Answer:

Planets do not twinkle because they are much closer to Earth and appear as extended sources of light. Atmospheric refraction affects different parts of a planet's disk equally, averaging out the variations and preventing twinkling.

2. What is called absolute refractive index?

Answer:

The absolute refractive index (n) of a medium is the ratio of the speed of light in a vacuum (c) to the speed of light in that medium (v). It is given by:

$$n = \frac{c}{v}$$

3. What is farsightedness?

Answer:

Farsightedness (Hypermetropia) is a vision defect where a person can see distant objects clearly but has difficulty focusing on nearby objects. It occurs due to the shortening of the eyeball or low converging power of the eye lens and is corrected using a convex lens.

4. What do you understand by electromagnetic induction?

Answer:

Electromagnetic induction is the phenomenon of generating an electric current in a conductor by changing the magnetic field around it. This was discovered by Faraday, and it is the working principle behind generators and transformers.

5. Why is inert gas filled in electric bulb?

Answer:

Inert gases such as argon or nitrogen are filled in electric bulbs to prevent the filament from burning out quickly by reducing oxidation and prolonging the bulb's lifespan.

6. What do you understand by potential difference?

Answer:

Potential difference is the amount of work done to move a unit charge from one point to another in an electric circuit. It is measured in volts (V) and is given by:

$$V = \frac{W}{Q}$$

where W = work done and Q = charge.

7. What is called the best source of energy?

Answer:

The best source of energy is one that is efficient, renewable, easily available, and eco-friendly. Examples include solar energy, wind energy, and hydropower, as they are sustainable and cause minimal pollution.

8. What is dynamo? What is its use?

Answer:

A dynamo is a device that converts mechanical energy into electrical energy using the principle of electromagnetic induction. It is commonly used in bicycles, power plants, and generators to produce electricity.

Long answer type questions

9. What are defects of vision? What are their types? How are the defects resolved?

Solution:

Defects of vision are conditions where the eye is unable to focus light properly on the retina, causing blurred or improper vision. These defects occur due to irregularities in the shape of the eye lens, cornea, or eyeball length.

Types of Vision Defects:

1. Myopia (Nearsightedness):

A person with myopia can see nearby objects clearly but has difficulty seeing distant objects.

Cause:

Eyeball is too long, or the lens is too curved, causing light to focus before the retina.

Correction:

A concave lens (diverging lens) is used to spread light rays before they reach the eye, shifting the focus onto the retina.

2. Hypermetropia (Farsightedness):

A person with hypermetropia can see distant objects clearly but has difficulty seeing nearby objects.

Cause:

Eyeball is too short, or the lens is too flat, causing light to focus behind the retina.

Correction:

A convex lens (converging lens) is used to bring the light rays together before entering the eye, shifting the focus onto the retina.

3. Presbyopia:

This defect occurs with aging, where both near and distant vision become weak due to reduced flexibility of the eye lens.

Cause:

Weakening of ciliary muscles and loss of lens elasticity due to aging.

Correction:

Bifocal lenses with convex lenses for near vision and concave lenses for distant vision are used.

4. Astigmatism:

A person with astigmatism experiences blurred vision due to an irregularly shaped cornea or lens.

Cause:

Uneven curvature of the cornea or lens results in improper focusing of light on the retina.

Correction:

Cylindrical lenses are used to correct the curvature and properly focus light onto the retina.

10. Describe the structure and working method of a biogas plant.

Solution:

A biogas plant is a system that converts organic waste (like cow dung, agricultural waste, and sewage) into biogas (mainly methane) through the anaerobic digestion process.

Structure of a Biogas Plant:

A typical biogas plant consists of the following parts:

Inlet Chamber: Organic waste (cow dung, kitchen waste, etc.) is mixed with water to form a slurry and fed into the plant through this chamber.

Digester Tank: A large, sealed chamber where the decomposition of organic matter occurs under anaerobic (oxygen-free) conditions. It contains methanogenic bacteria that break down the organic material.

Gas Holder/Dome: A storage space above the digester that collects the biogas produced during decomposition.

Outlet Chamber: The spent slurry (digested material) exits through this chamber and can be used as organic fertilizer.

Gas Pipe: A pipeline that carries the produced biogas to homes or industries for use.

Short answer Type Questions (Chemistry)

11. Write three information obtained from chemical equation.

Answer:

A chemical equation provides the following information:

Reactants and Products: It shows the substances that react (reactants) and the substances formed (products) in a chemical reaction.

Mole Ratio of Substances: It provides the quantitative relationship between reactants and products using balanced coefficients (stoichiometry).

Physical States: It indicates the physical states of substances (solid (s), liquid (l), gas (g), and aqueous (aq)).

12. Why is an aqueous solution of sodium carbonate alkaline?

Answer:

Sodium carbonate (Na_2CO_3) dissolves in water to form carbonate ions (CO_3^{2-}), which undergo hydrolysis:



The production of hydroxide ions (OH^-) makes the solution alkaline (basic) in nature.

13. What is an indicator? Write the name of an indicator.

Answer:

An indicator is a substance that changes color in the presence of an acid or a base, helping to determine the pH of a solution.

Example: Litmus indicator turns red in acids and blue in bases.

14. What is the difference between an atom and an ion?

Answer:

Atom	Ion
An atom is the smallest unit of an element that retains its identity.	An ion is a charged particle formed when an atom gains or loses electrons.
It is electrically neutral (number of protons = number of electrons).	It carries a positive or negative charge.
Example: Na (sodium atom)	Example: Na^+ (sodium ion), Cl^- (chloride ion)

15. Define ores.

Answer:

Ores are naturally occurring minerals from which metals can be economically extracted. These minerals contain high concentrations of a particular metal along with impurities. Example: Bauxite ($\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$) is an ore of aluminum.

16. Why have detergents replaced soap?

Answer:

Detergents have replaced soap because:

They work efficiently in both hard and soft water, while soap forms scum in hard water. They have stronger cleaning properties, removing grease and stains more effectively. They do not react with mineral ions in water, ensuring better foaming and cleaning action. They are synthetic and long-lasting, making them more effective for modern cleaning needs.

17. What are fossil fuels?

Answer:

Fossil fuels are non-renewable sources of energy formed from the remains of ancient plants and animals over millions of years. These include:

Coal

Petroleum (Crude oil and its derivatives like diesel, petrol, and kerosene)

Natural gas (Methane - CH_4)

Fossil fuels are widely used for energy production, transportation, and industrial applications, but they contribute to pollution and global warming.

18. What do you understand by short and long periods of periodic table?

Answer:

- Short periods: These are the first three periods of the periodic table (Period 1,2 and 3), which contain fewer elements.
- Period 1 → 2 elements
- Period 2 and 3 → 8 elements each
- Long periods: These are Periods 4, 5, 6, and 7, which have more elements (18 to 32 elements) and include transition metals and lanthanides/actinides.
- Period 4 and 5 → 18 elements each
- Period 6 and 7 → 32 elements each

Long periods accommodate more complex electron configurations and elements with heavier atomic numbers.

Long Answer Type Questions

19. Differentiate between metals and non-metals on the basis of physical and chemical properties.

Answer:

Differences Based on Physical Properties:

Property	Metals	Non-Metals
Appearance	Lustrous (shiny)	Non-lustrous (except iodine)

State	Mostly solids (except mercury)	Solids, liquids, or gases
Hardness	Generally hard (except sodium & potassium)	Usually soft (except diamond)
Malleability	Can be beaten into sheets	Brittle, cannot be beaten into sheets
Ductility	Can be drawn into wires	Not ductile
Conductivity	Good conductors of heat and electricity	Poor conductors (except graphite)
Density	High density	Low density

Differences Based on Chemical Properties:

Property	Metals	Non-Metals
Reaction with Oxygen	Forms metal oxides (basic in nature)	Forms non-metal oxides (acidic in nature)
Reaction with Water	Some react to form metal hydroxides	Generally do not react with water
Reaction with Acids	React with acids to release hydrogen gas	Do not react with acids
Reaction with Bases	Mostly no reaction (except amphoteric metals)	Some form salts with bases
Electronegativity	Low (lose electrons to form cations)	High (gain electrons to form anions)

20. What is energy crisis ? Mention the measures to resolve it.

Answer:

An energy crisis refers to the shortage of energy resources, leading to a lack of electricity, fuel, and power supply for industries, transportation, and households. This happens due to overconsumption, depletion of fossil fuels, and poor energy management.

Causes of Energy Crisis:

1. Overuse of Fossil Fuels – Excessive reliance on coal, petroleum, and natural gas.
2. Deforestation – Leads to loss of biomass fuel sources.
3. Population Growth – Increased demand for electricity and fuel.
4. Industrialization – High energy consumption in factories and manufacturing units.
5. Wastage of Energy – Inefficient use of energy in daily life.

Measures to Resolve Energy Crisis:

1. Use of Renewable Energy Sources:

- Promote solar, wind, hydro, geothermal, and biomass energy.
- Encourage solar panels for homes and industries.

2. Energy Conservation:

- Use energy-efficient appliances (LEDs, energy-saving fans, etc.).
- Turn off lights and devices when not in use.
- Improve insulation in buildings to reduce energy wastage.

3. Increase in Alternative Fuel Use:

- Promote electric vehicles (EVs) to reduce fuel consumption.
- Develop biofuels from agricultural waste.

4. Reducing Dependence on Fossil Fuels:

- Develop nuclear energy plants for electricity production.
- Encourage hydropower projects.

Short Answer Type Question (Biology)

21. Write the names of four organelles of a cell.

Answer:

Four important organelles of a cell are:

Nucleus – Controls cell activities and contains genetic material (DNA).

Mitochondria – The powerhouse of the cell, responsible for energy production (ATP synthesis).

Endoplasmic Reticulum (ER) – Helps in protein and lipid synthesis (Smooth ER & Rough ER).

Golgi Apparatus – Modifies, sorts, and packages proteins for transport.

22. Define respiration.

Answer:

Respiration is a biological process in which cells break down glucose in the presence of oxygen to release energy (ATP). The general equation for aerobic respiration is:



23. What is the difference between xylem and phloem?

Feature	Xylem	Phloem
Function	Transports water and minerals	Transports food (sugars) from leaves to other parts
Direction of Flow	Unidirectional (roots to leaves)	Bidirectional (both upward and downward)
Composition	Made of tracheids, vessels, fibers, and parenchyma	Made of sieve tubes, companion cells, fibers, and parenchyma
Living/Dead Cells	Mostly dead cells	Mostly living cells
Location in Plant	Found in inner part of vascular bundles	Found in outer part of vascular bundles

24. What is excretion? Write the names of its two main parts.

Answer:

Excretion is the biological process by which waste products of metabolism are removed from the body to maintain homeostasis.

The two main parts of the human excretory system are:

Kidneys – Remove nitrogenous waste (urea) and regulate water balance.

Lungs – Remove carbon dioxide (CO₂) produced during respiration.

25. What is phototropism?

Answer:

Phototropism is the growth movement of plants in response to light.

Positive phototropism – Growth toward the light (e.g., shoot).

Negative phototropism – Growth away from the light (e.g., roots).

It is controlled by the plant hormone auxin.

26. What is pollination?

Answer:

Pollination is the transfer of pollen grains from the anther (male part) to the stigma (female part) of a flower.

Types of pollination:

Self-pollination – Pollen transfers within the same flower or plant.

Cross-pollination – Pollen transfers from one plant to another.

27. How is DNA the basis of heredity?

Answer:

DNA (Deoxyribonucleic Acid) carries genetic instructions that determine the traits of an organism. It is composed of nucleotides (Adenine, Thymine, Guanine, Cytosine) arranged in a double-helix structure.

During reproduction, DNA is passed from parents to offspring, ensuring inheritance of characteristics.

Genes on DNA control protein synthesis, influencing growth, appearance, and metabolism.

28. What are the harmful effects of aerosol chemicals?

Answer:

- **Aerosol chemicals**, like **CFCs (Chlorofluorocarbons)**, have several harmful effects:
- **Ozone layer depletion** – CFCs break down ozone (O₃), increasing UV radiation exposure.
- **Global warming** – Aerosols contribute to greenhouse gas effects, raising Earth's temperature.
- **Respiratory problems** – Inhalation can cause lung diseases and allergies.
- **Water and soil pollution** – Aerosol residues contaminate natural ecosystems.
- **Climate change** – Aerosols impact **cloud formation** and disrupt weather patterns.

Long Answer Type Questions

29. What is photosynthesis? Describe it with a suitable diagram.

Answer:

Photosynthesis is the process by which green plants, algae, and some bacteria use sunlight, carbon dioxide, and water to produce glucose (food) and oxygen. This process takes place in the chloroplasts of plant cells and involves the green pigment chlorophyll.

Photosynthesis Equation:



(Carbon dioxide + Water + Sunlight \rightarrow Glucose + Oxygen)

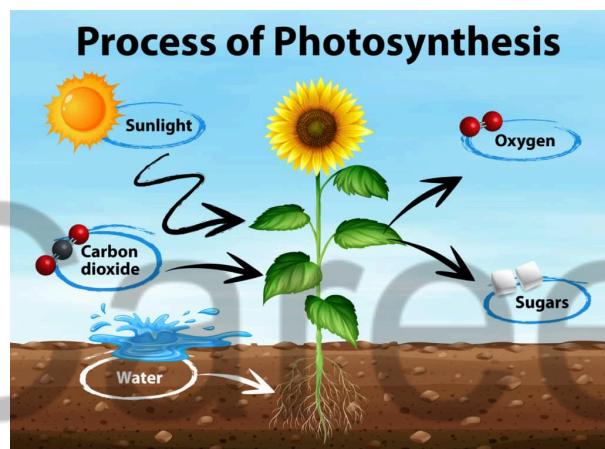
Steps of Photosynthesis:

1. Light-dependent Reactions (Occurs in Thylakoid Membrane):

- Sunlight is absorbed by chlorophyll.
- Water molecules (H_2O) are split, releasing oxygen (O_2).
- ATP (energy) and NADPH (electron carrier) are produced.

2. Light-independent Reactions (Calvin Cycle, Occurs in Stroma):

- Carbon dioxide (CO_2) is used to synthesize glucose ($\text{C}_6\text{H}_{12}\text{O}_6$).
- ATP and NADPH from light-dependent reactions help in glucose formation.



30. Explain recycling of waste materials with examples.

Answer:

Recycling is the process of converting waste materials into reusable products to reduce environmental pollution, conserve natural resources, and promote sustainability.

Steps in Recycling:

Collection and Sorting: Waste materials are collected and separated based on their type (plastic, paper, metal, etc.).

Processing: The waste is cleaned, melted, or broken down into raw materials.

Manufacturing: New products are made from recycled materials.

Reuse and Distribution: The recycled products are sold and used again.

Examples of Recycling:

Plastic Recycling: Used plastic bottles are melted and reprocessed into new bottles, containers, or synthetic fibers.

Paper Recycling: Old newspapers and cardboard are shredded, pulped, and made into new paper products.

Metal Recycling: Aluminum cans are melted and reshaped into new cans or other metal products.

Glass Recycling: Used glass bottles are crushed, melted, and reshaped into new glass items.