

SCIENCE

I. Choose the correct answer from the given alternatives: ×1

- $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$
The above reaction is an example of
(a) combination reaction (b) double displacement reaction
(c) decomposition reaction (d) displacement reaction
- What happens when hydrogen gas is passed over heated copper oxide?
(a) Black coating on the surface turns blue
(b) Black coating on the surface turns brown
(c) Black coating on the surface turns green
(d) Black coating on the surface turns white
- $\text{Acid} + \text{Metal} \rightarrow \text{Salt} + ?$
(a) Oxygen gas (b) Hydrogen gas
(c) Water (d) Nitrogen
- pH of milk of magnesia is
(a) 2.2 (b) 7.4
(c) 10 (d) 14
- Which among the following is the most reactive metal?
(a) Magnesium (b) Calcium
(c) Zinc (d) Aluminium
- Solder is an alloy of
(a) Cu and Zn (b) Cu and Sn
(c) Pb and Sn (d) Pb and Zn
- Alcohols may be represented by the general formula
(a) $\text{C}_n\text{H}_{2n+2}-\text{OH}$ (b) $\text{C}_n\text{H}_{2n}-\text{OH}$
(c) $\text{C}_n\text{H}_{2n+1}-\text{OH}$ (d) $\text{C}_n\text{H}_{2n-1}-\text{OH}$
- Pentane has molecular formula C_5H_{12} . How many covalent bonds are there?
(a) 5 (b) 12
(c) 16 (d) 17
- The element with atomic number 14 is hard and forms acidic oxide with a covalent halide. Which category does the element belong?
(a) Metal (b) Metalloid
(c) Non-metal (d) Left hand side elements
- The atomic number of an element is a more fundamental property than atomic mass. This was showed by
(a) Henry Mosely (b) J. Dobereiner
(c) John Newland (d) Dmitri Ivanovich Mendeleev
- What prevents backflow of blood inside the heart during contraction?
(a) Valves in the heart
(b) Thick muscular walls of ventricles
(c) Thin walls of atria
(d) All of the above

12. The xylem in plants is responsible for
 (a) transport of water (b) transport of food
 (c) transport of amino acids (d) transport of oxygen
13. The growth of pollen tubes towards ovules is due to
 (a) hydrotropism (b) chemotropism
 (c) geotropism (d) phototropism
14. The gap between two neurons is called a
 (a) dendrite (b) synapse
 (c) axon (d) impulse
15. Characters transmitted from parents to offspring are present in
 (a) cytoplasm (b) ribosome
 (c) golgi bodies (d) genes
16. The anther contains
 (a) sepals (b) ovules
 (c) pistil (d) pollen grains
17. In evolutionary terms, we have more in common with a
 (a) Chinese school boy (b) Chimpanzee
 (c) spider (d) bacterium
18. In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F₂ is
 (a) 1:3 (b) 3:1
 (c) 1:1 (d) 2:1
19. Which of the following cannot be used to make a lens?
 (a) Water (b) Glass
 (c) Plastic (d) Clay
20. A beam of light incident on a plane mirror forms a real image on reflection. The incident beam is
 (a) parallel (b) Convergent
 (c) Divergent (d) Not certain
21. A person cannot see distinctly objects kept beyond 2m. this defect can be corrected by using lens of
 (a) - 0.2 D (b) - 0.5 D
 (c) + 0.2 D (d) + 0.5 D
22. The human eye forms the image of an object at its
 (a) cornea (b) iris
 (c) pupil (d) retina
23. Which of the following gases is filled in electric bulbs?
 (a) Helium and Neon (b) Neon and Argon
 (c) Argon and Nitrogen (d) Argon and Hydrogen
24. Coulomb is the S.I unit of
 (a) charge (b) current
 (c) resistance (d) potential difference
25. The nature of magnetic field line passing through the centre of a current carrying circular loop is
 (a) circular (b) ellipse
 (c) parabolic (d) straight line

26. Ocean thermal energy is due to
 (a) energy stored by waves in the ocean
 (b) temperature difference at different levels in the ocean
 (c) pressure difference at different levels in the ocean
 (d) tides arising out in the ocean
27. Solar cells are made of
 (a) germanium (b) silver
 (c) silicon (d) copper
28. In an ecosystem, the 10% of energy available for transfer from one trophic level to the next is in the form of
 (a) heat energy (b) light energy
 (c) chemical energy (d) mechanical energy
29. The percentage of solar radiation absorbed by all the green plants for the process of photosynthesis is about
 (a) 1% (b) 3%
 (c) 5% (d) 10%
30. In a food chain, the second trophic level is always occupied by
 (a) carnivores (b) herbivores
 (c) decomposers (d) producers

II. Answer the following questions in one word or one sentence: ×1

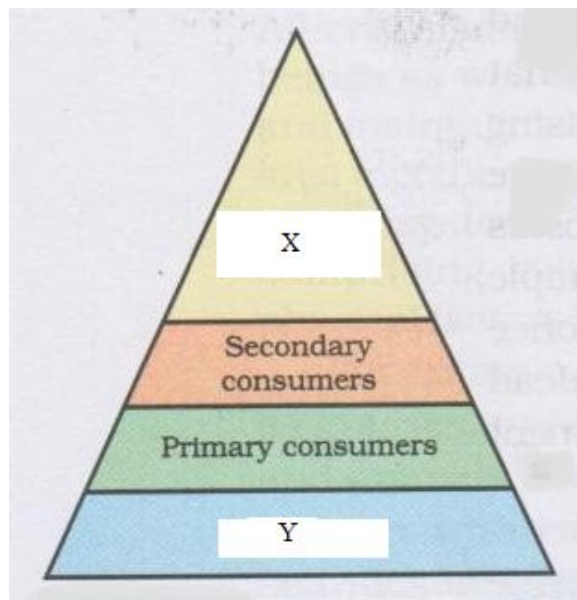
1. Define rancidity.
2. What is the chemical formula of marble?
3. What is an alkali?
4. Name the hardest substance in the human body.
5. What is meant by water of crystallization?
6. Name the liquid non-metal.
7. Give the full form of PVC.
8. What is Anodising?
9. What are structural isomers?
10. Complete the reaction
 $\text{NaOH} + \text{CH}_3\text{COOH} \rightarrow ? + ?$
11. Which element has two shells, both of which are completely filled?
12. Name any semi-metal.
13. The kidneys in human beings are part of which system?
14. Name the enzyme present in saliva.
15. Give an example of plant hormone which promotes growth.
16. Name the hormone secreted by testes.
17. Name one organism which reproduces through budding.
18. What is the full form of DNA?
19. *Spirogyra* filaments can grow fully from the pieces we cut. What is this asexual mode of reproduction called?
20. Who is known as the Father of Genetics?
21. Name one vestigial organ in human beings.
22. Name a mirror that can give an erect and enlarged image of an object.
23. What type of mirror is used in a search light?

24. Write the lens formula.
25. What is the front transparent part of the human eye called?
26. Define 1 watt hour.
27. Why are coils of electric irons made of alloy rather than pure metal?
28. What is a solenoid?
29. Why does a compass needle get deflected when brought near a magnet?
30. What is a magnetic field?
31. Name the main constituent of biogas.
32. What is the minimum velocity required for obtaining useful energy with a windmill?
33. What is nuclear fission?
34. Why are green plants called producers?
35. State one reason for the conservation of forest and wild life.

III. Answer the following questions in about 20-30 words:

1. Why should magnesium ribbon be cleaned before burning in air? 2
2. Oil and fat containing food items are flushed with nitrogen. Why? 2
3. What are antacids? Explain their role in providing relief from stomach ache. 1+1=2
4. While diluting an acid, why is it recommended that the acid should be added to water and not water to acid? 2
5. Define (a) Ore (b) Gangue 1+1=2
6. Why do ionic compounds have high melting points? Give two points. 1×2=2
7. Name two metals which are found in nature in the free state. 1+1=2
8. What are the two properties of carbon which lead to the huge number of carbon compounds we see around? 1×2=2
9. What is substitution reaction? Give one example. 1+1=2
10. Write two consequences of deficiency of haemoglobin in our body. 1×2=2
11. What is the role of acid in our stomach? 2
12. Tendrils encircle or coil around the object in contact with it. Elaborate. 2
13. Why are some patients of diabetes treated by giving injections of insulin? 2
14. Differentiate between binary fission and multiple fission? 1+1=2
15. Give two advantages of sexual reproduction over asexual reproduction. 1×2=2
16. What is the importance of DNA copying in reproduction? Give two points. 1×2=2
17. Only variations that confer an advantage to an individual organism will survive in a population. Justify the statement giving two points. 1×2=2
18. Explain the term homologous organs with one example. 1+1=2
19. Mention two factors that lead to the rise of a new species? 1×2=2
20. Explain why we see mirror image of the word AMBULANCE in front of some vehicles. 2
21. The radius of curvature of a spherical mirror is 30cm. What is its focal length? 2
22. A concave mirror is used in the headlight of vehicles. Why is it so? Explain. 2
23. What is the far point and near point of the human eye with normal vision? 1+1=2
24. A student has difficulty reading the blackboard while sitting in the last row. What could be the defect the child is suffering from? How can it be corrected? 1+1=2
25. State Ohm's law. Express it mathematically. 1+1=2
26. The potential difference between the terminals of an electric heater is 80V when it draws a current of 5A from the source. What current will the heater draw if the potential difference is increased to 160V? 2

27. Give a note on magnetism in human beings. 2
28. Why don't two magnetic lines of force intersect each other? Give two reasons. 1×2=2
29. List any two advantages of solar cells. 1×2=2
30. Why is bio-gas plant safe and efficient method of waste disposal? 2
31. What are hot spots and hot springs in geothermal energy? 1+1=2
32. What are the two main components of an ecosystem? 1×2=2
33. Write the appropriate name of the tropical level x and y in the given figure with an example. 1×2=2

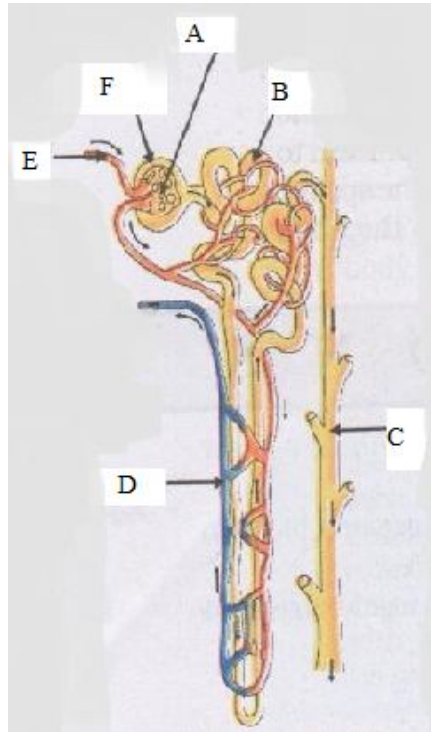


34. List any two hazards of using nuclear energy. 1×2=2
35. Mention any two advantages of storing water underground. 1×2=2

IV. Answer the following questions in about 40-60 words:

1. Balance the following equations
- (a) $\text{HNO}_3 + \text{Ca(OH)}_2 \rightarrow \text{Ca(NO)}_2 + \text{H}_2\text{O}$
- (b) $\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$
- (c) $\text{Fe} + \text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$ 1×3=3
2. Lead nitrate solution is taken in a test tube. Potassium iodide solution is added to this solution. A precipitate forms. Name the colour of the precipitate formed. Name the compound that is precipitated. Name the type of reaction that has taken place. 1+1+1=3
3. A solution of a substance X is used for white washing a room.
- (a) Name the substance X.
- (b) Write its chemical formula.
- (c) Write the reaction of the substance X with water. 1×3=3
4. What is Aqua regia? Give two uses of it. 1+2=3
5. Give three reasons why copper is used to make hot water tanks and not steel. 1×3=3
6. What is hydrogenation? Write any two of its industrial application. 1+2=3
7. What is a homologous series? Explain two examples. 1+2=3
8. The electronic configuration of an element X is 2,8,8,2. To which period and group does it belong? State its valency. Justify your answer in each case. 1+1+1=3

9. Explain the trends in the Modern Periodic Table. **1×3=3**
10. What is meant by atomic radius or atomic size of an atom? How does it vary along a group and a period? **1+2=3**
11. What are the necessary conditions for autotrophic nutrition and what are its by-products? **3**
12. Label the indicated parts in the given figure. **½×6=3**



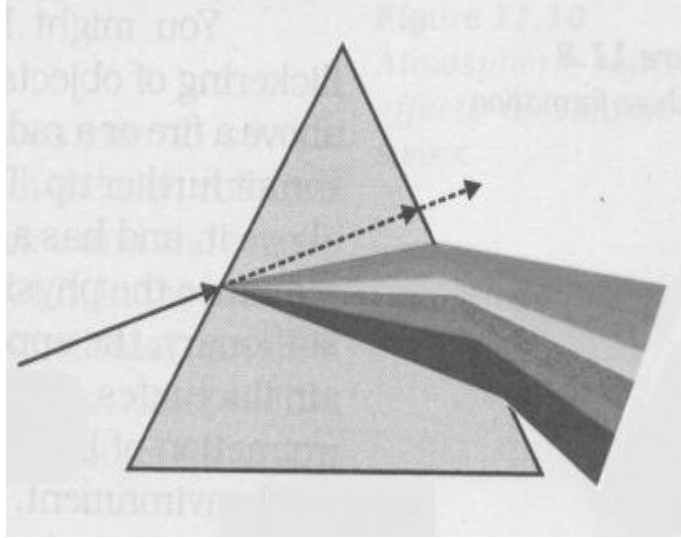
13. Design an experiment to demonstrate hydrotropism. **3**
14. Compare and contrast nervous and hormonal mechanisms for control and coordination in animals, giving three points each. **1×3=3**
15. Which is the main thinking part of the brain? State how it functions. **1+2=3**
16. What are the changes seen in girls at the time of puberty? Give three points. **1×3=3**
17. Give three advantages of vegetative propagation for growing some types of plants. **1×3=3**
18. Give three reasons for adopting contraceptive methods. **1×3=3**
19. What are fossils? What do they tell us about the process of evolution? **1+2=3**
20. A doctor has prescribed a corrective lens of +1.5D. Find the focal length of the lens. Is the prescribed lens diverging or converging? **2+1=3**
21. What is meant by power of a lens? Give its S.I unit. When two or more lenses are placed in contact, what will be their combined power? **1+1+1=3**
22. A concave mirror produces three times magnified of an object placed at 10cm in front of it. Where is the image located? **3**
23. Explain the terms-
 (a) Ciliary muscles (b) Accomodation (c) Blind spot **1×3=3**
24. State two main causes of a person developing near sightedness. How can this defect be corrected? **2+1=3**

25. Draw a schematic diagram of a circuit consisting of battery of three cells of 2V each, 5Ω resistor, an 8Ω resistor and a 12Ω resistor, and a plug key, all connected in series. **3**
26. Two lamps, one rated 100W at 220V, and the other 60W at 220V are connected in parallel to an electric main supply. What current is drawn from the line if the supply voltage is 220V? **3**
27. State the factors on which the resistance of a conductor depends. **$1 \times 3 = 3$**
28. What is the function of an earth wire? Why is it necessary to earth metallic appliances? **$1 + 2 = 3$**
29. Draw the pattern of magnetic field lines around a bar magnet. **3**
30. List any three qualities of an ideal source of energy. **$1 \times 3 = 3$**
31. Write any three disadvantages of using fossil fuels. **$1 \times 3 = 3$**
32. What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem? **$1 + 2 = 3$**
33. Why bacteria and fungi are called decomposers? Write two advantages of decomposers to the environment. **$1 + 2 = 3$**
34. List any three suggestions for reducing the problem of waste disposal. **$1 \times 3 = 3$**
35. How are forests important for the local people? Give three points. **$1 \times 3 = 3$**

V. Answer the following questions in about 70-100 words:

1. What are exothermic and endothermic reactions? How is it represented? Give one example each. **$2 + 2 + 1 = 5$**
2. What is a pH scale? What is the range of the pH scale? Give any three applications of the pH scale. **$1 + 1 + 3 = 5$**
3. What is the chemical name of Plaster of Paris? Give the reaction between plaster of Paris and water. Write any two uses of plaster of Paris. **$1 + 2 + 2 = 5$**
4. Explain electrolytic refining of metals with the help of a labelled diagram. **$3 + 2 = 5$**
5. Differentiate between metal and non-metal on the basis of their chemical properties. **$1 \times 5 = 5$**
6. Explain cleansing action of soap with the help of a diagram. **$3 + 2 = 5$**
7. State Newland's Law of Octaves? What were the limitations of Newlands Octaves? **$1 + 4 = 5$**
8. Write four differences between aerobic and anaerobic respiration. Name one organism each which uses aerobic and anaerobic mode of respiration. **$1 + 4 = 5$**
9. Give five points each to show how the movement of leaves of sensitive plant is different from the movement of a shoot towards light. **$1 \times 5 = 5$**
10. Draw a labelled diagram of neuron and explain its function. **$2 + 3 = 5$**
11. (a) What are sexually transmitted diseases? Name any one which is caused by bacteria and one caused by viral infection. **$1 + 2 + 2 = 5$**
 (b) Mention any two methods to avoid such diseases. **$1 + 4 = 5$**
12. How does vegetative propagation occur in nature? Explain with four examples. **$1 + 4 = 5$**
13. Explain how sexual reproduction gives rise to more viable variations than asexual reproduction. How does this affect the evolution of those organisms that reproduce sexually? **5**
14. How is the sex (gender) of a child determined in human beings? Explain. **5**
15. An object 5cm in length is held away from a converging lens of focal length of 10cm. Draw the ray diagram and find the position, size and the nature of the image formed. **5**
16. Draw ray diagrams for the following (convex lens) when an object is placed at-
 (a) Infinity (b) F (c) 2F (d) Between P and F (e) Between F and 2F **$1 \times 5 = 5$**

17. How is a rainbow formed? Given below is a figure. What is the phenomenon taking place in the figure? Identify the colours which are expected after the phenomenon. 2+1+2=5



18. What is heating effect of electric current? Write any four applications of heating effect of electric current. 1+4=5
19. Draw a labelled diagram of an electric motor. Explain its principle and working. 2+3=5
20. Explain the principle and working of an electric generator by drawing a labelled diagram. 3+2=5
21. With the help of a labelled diagram, explain the working of a bio-gas plant. 2+3=5
22. What are the environmental consequences of the increasing demand for energy? Suggest four steps to reduce energy consumption? 1+4=5
23. What is ozone layer? How is ozone formed in the upper atmosphere? Give three reasons why the damage of ozone layer is a cause for concern for all? 1+1+3=5
24. List five benefits of water harvesting. 1×5=5
25. What do 5 R's refer to save the environment? Elaborate. 1×5=5
