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<th>VSA (1 mark)</th>
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Note: * - Internal Choice Questions of same chapter.
AR – Assertion, Reason based question
SECTION – A

1. Which of the following reactions will not take place?
   (a) Zn + CuSO₄ → ZnSO₄ + Cu
   (b) Zn + MgSO₄ → ZnSO₄ + Mg
   (c) 2KBr + Cl₂ → KCl + Br₂
   (d) Mg + FeSO₄ → MgSO₄ + Fe

2. Which of the following gives the correct increasing order of acidic strength?
   (a) Water < Acetic acid < Hydrochloric acid
   (b) Water < Hydrochloric acid < Acetic acid
   (c) Acetic acid < Water < Hydrochloric acid
   (d) Hydrochloric acid < Water < Acetic acid

3. Which of the following elements will form an acidic oxide?
   (a) An element with atomic number 7
   (b) An element with atomic number 3
   (c) An element with atomic number 12
   (d) An element with atomic number 19
   OR
   Which of the following set of elements is written in order of their increasing metallic character?
   (a) Be, Mg, Ca
   (b) Na, Li, K
   (c) Mg, Al, Si
   (d) C, O, N

4. The ability of eye lens to adjust its focal length to form a sharp image of the object at varying distances on the retina is called
   (a) Power of observation of the eye
   (b) Power of adjustment of the eye
   (c) Power of accommodation of the eye
   (d) Power of enabling of the eye
   OR
   The air layer of atmosphere whose temperature is less than the hot layer behave as optically
   (a) denser medium
   (b) rarer medium
   (c) inactive medium
   (d) either denser or rarer medium

5. Two wires of same length and area, made of two materials of resistivity \( \rho_1 \) and \( \rho_2 \) are connected in parallel V to a source of potential. The equivalent resistivity for the same length and area is
   (a) \( \rho_1 + \rho_2 \)
   (b) \( \frac{\rho_1 + \rho_2}{\rho_1 \rho_2} \)
   (c) \( \frac{\rho_1 \rho_2}{\rho_1 + \rho_2} \)
   (d) \( |\rho_1 - \rho_2| \)
6. If $R_1$ and $R_2$ be the resistance of the filament of 40 W and 60 W respectively operating 220 V, then
   (a) $R_1 < R_2$  
   (b) $R_2 < R_1$  
   (c) $R_1 = R_2$  
   (d) $R_1 \geq R_2$

7. Which of the following organism produces biogas from cow drug sherry in the biogas plant?
   (a) aerobic bacteria
   (b) anaerobic bacteria
   (c) protozoa
   (d) fungi

8. Ground water will not be depleted due to
   (a) afforestation
   (b) thermal power plants
   (c) loss of forest, and decreased rainfall
   (d) cropping of high water demanding crops
   OR
   Pick the right combination of terms which has no fossil fuel.
   (a) Wind, ocean and coal
   (b) Kerosene, wind and tide
   (c) Wind, wood, sun
   (d) Petroleum, wood, sun

9. What were the limitations of Newlands' Law of Octaves?

10. Write the molecular formula of benzene and state the number of double bonds in its structure.

11. Question number 11(i)-11(iv) are based on context and table given below. Study the context, table and answer the following questions.

(a) Calorific value of a fuel is defined as the amount of heat energy released in joule or kilo-joule by the complete burning of 1-gram fuel.
   Calorific values of different fuels are given below:

<table>
<thead>
<tr>
<th>Table: Calorific value of some fuels</th>
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</thead>
<tbody>
<tr>
<td>S. No.</td>
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</tbody>
</table>

11(i) What does ‘LPG’ stands for .
11(ii) Among the gaseous fuels, which fuel is ideal for burning?
(b) Two coils P and S are wound over the same iron core. Coil P is connected to battery and key and the coil S is connected to galvanometer.

11(iii) What will happen when current in the coil P is started by closing the key.  
11(iv) What will happen when current continues to flow in coil P.

12. Answer question numbers 12(i)-12(iv) on the basis of your understanding of the following paragraph and the related studied concepts.

Touching a hot object is an urgent and dangerous situation for us. We need to detect it, and respond to it. All information from our environment is detected by the specialized tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So, gustatory receptors will detect taste while olfactory receptors will detect smell. This information, acquired at the end of the dendrite tip of a nerve cell sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end. At the end of the axon, the electrical impulse sets off the release of some chemicals. These chemicals cross the gap, or synapse, and start a similar electrical impulse in a dendrite of the next neuron. This is a general scheme of how nervous impulses travel in the body.

12(i) Which type of cells detects the information from our environment?
(a) Axon  (b) Nucleus  (c) Dendrite  (d) Cell body

12(ii) What is the role of gustatory receptors and olfactory receptors?

12(iii) What is the tip of a nerve cell called?

12(iv) What is the type of signal used by the nervous system to transmit messages?
(a) electrical impulse  (b) nervous impulse  (c) gustatory receptors  (d) olfactory receptors

For question numbers 13 and 14, two statements are given— one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below

i) Both A and R are true and R is correct explanation of the assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true.
13. **Assertion (A):** Soaps are 100% biodegradable but do not work well with hard water.  
**Reason (R):** Some detergents are not biodegradable but work well with hard water.

14. **Assertion (A):** It is fatal to touch a live electric wire as the person gets a severe electric shock. In some cases, electric shock can even kill a person.  
**Reason (R):** The electric current passes through the body to the earth forming a circuit and burns the blood.

### SECTION – B

15. Rohit focused the image of a candle flame on a white screen using a convex lens. He noted down the position of the candle, screen and lens as under:

- Position of candle = 26.0 cm
- Position of convex lens = 50.0 cm
- Position of screen = 74.0 cm

i) What is the focal length of the convex lens?  
ii) Where will the image be formed if he shifts the candle towards the lens at a position of 38 cm?  
iii) Draw a ray diagram to show the formation of the image in case (ii) as said above?

16. The position of three elements A, B and C in the periodic table is shown below:

<table>
<thead>
<tr>
<th>Group</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
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<td>B</td>
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Giving reasons explain:
(a) Element A is a metal.  
(b) Element B has larger atomic size than the element C.  
(c) Element C has a valency of one.

17. What is baking soda chemically called? Give reaction involved in its preparation. Write one of its uses.  

**OR**

Name the products formed in each case when
(a) hydrochloric acid reacts with caustic soda.  
(b) granulated zinc reacts with caustic soda.  
(c) carbon dioxide is passed into lime water.

18. Write balanced equations for the following, mentioning the type of reaction involved.  
(a) Aluminium + Bromine $\rightarrow$ Aluminium bromide  
(b) Calcium carbonate $\rightarrow$ Calcium oxide + Carbon dioxide  
(c) Silver chloride $\rightarrow$ Silver + Chlorine

19. Explain the ways in which glucose is broken down in absence of oxygen.

20. How do Mendel’s experiments show that traits may be dominant or recessive?

21. What is a reflex arc? Draw a neat labelled diagram of the components in a reflex arc.
22. (a) What is the function of earth wire in electrical instruments?  
(b) Explain what is short circuiting an electric supply.  
(c) What is the usual current rating of the fuse wire in the line to feed (a) Lights and fans? (b) Appliances of 2kW or more power?

23. (a) What is ‘environmental pollution’?  
(b) Distinguish between biodegradable and non-biodegradable pollutants.  
(c) Choose the biodegradable pollutants from the list given below: Sewage, DDT, radioactive waste, agricultural waste.  

OR  
What is an ecosystem? List its two main components. We do not clean natural ponds or lakes but an aquarium needs to be cleaned regularly. Why is it so? Explain.

24. Define the term dispersion of white light. Name the colour of light which bends (i) the most, (ii) the least, while passing through a glass prism. Draw a ray diagram to justify your answer.  

OR  
What is atmospheric refraction? Use this phenomenon to explain the following natural events.  
(a) Twinkling of stars  
(b) Advanced sunrise and delayed sunset.

SECTION – C

25. State Ohm’s law. Write the necessary conditions for its validity. How is this law verified experimentally? What will be the nature of graph between potential difference and current for a conductor? Name the physical quantity that can be obtained from this graph.

26. (a) “A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it”. Draw ray diagram to justify this statement stating the position of the object with respect to the lens in each case.  
(b) An object of height 4 cm is placed at a distance of 20 cm from a concave lens of focal length 10 cm. Use lens formula to determine the position of the image formed.  

OR  
(a) Explain the following terms related to spherical lenses:  
(i) Optical centre (ii) Centres of curvature (iii) Principal axis (iv) Aperture (v) Principal focus  
(vi) Focal length  
(b) A converging lens has focal length of 12 cm. Calculate at what distance should the object be placed from the lens so that it forms an image at 48 cm on the other side of the lens.

27. (a) Define activity series of metals. Arrange the metals gold, copper, iron and magnesium in order of their increase in reactivity.  
(b) What will you observe when:  
(i) Some zinc pieces are put in copper sulphate solution.  
(ii) Some silver pieces are put into green coloured ferrous sulphate solution.  

OR  
(a) Give two methods to prevent the rusting of iron.  
(b) Name the ores of the following metals:  
(i) mercury, and  
(ii) zinc  
(c) Explain with the help of a diagram, how copper metal can be refined? Label the important arrangements in the experimental set up.

28. (a) Draw a diagram depicting Human Alimentary Canal and label on it : Gall bladder, Liver and Pancreas.  
(b) State the roles of Liver and Pancreas.  
(c) Name the organ which performs the following functions in humans:
(i) Absorption of digested food
(ii) Absorption of water.

29. List any four modes of asexual reproduction. Give one example of each. Explain any two modes of asexual reproduction.

OR

(a) Why does fertilisation occur only once in a month in a human female? Explain.
(b) Prenatal sex determination has been prohibited by law. State the necessity of enforcement of this law.
(c) Where are human testis located and why? State their functions.

30. What are micelles? Why does it form when soap is added to water? Will a micelle be formed in other solvents such as ethanol also? State briefly how the formation of micelles help to clean the clothes having oily spots.