

1. Why carbon forms strong bonds with other carbon atoms, hydrogen, oxygen, nitrogen or sulphur?
2. Name the part of eye responsible for conversion of light into electrical impulses.
3. a. How does valency vary in a group on going from top to bottom?    b. How does atomic size vary in a period on going from left to right?
4. Write one property of hydrogen which makes it resemble with (a) Alkali metals (b) Halogens.
5. a. Arrange the following common substances in the increasing order of refractive indices. Ice, Kerosene, Glass, Diamond, Alcohol, Water  
b. Is it necessary that optically dense medium possesses greater mass density? Give an example.
6. On reaction with sodium hydroxide, X yielded Ethanoic acid and ethanol.  
(a) Give the IUPAC name of X? (b) Name the reaction. (c) Give a chemical reaction for the above reaction.
7. (a) How does the electronic configuration of an atom related to its position in the Modern periodic table? Give one example.  
(b) Why nitrogen is more electronegative than phosphorus?
8. A concave lens has focal length of 25 cm. At what distance should the object from the lens be placed so that it forms an image at 20 cm distance from the lens? Also find the magnification produced by the lens.
9. Give an explanation for the formation of a rainbow.
10. How are we able to see distant and near by objects clearly? Which part of eye helps in changing curvature of lens? Why no image is formed at blind spot?
11. (a) Why magnification is taken negative for real images and positive for virtual images? (2)  
(b) Why convex mirror is used in rear view mirrors and not concave mirror? (2)  
(c) Power of concave lens is 4.5 D. Find its focal length. (1)
12. (a) Find the size, nature and position of image formed when an object of 1 cm is placed at a distance of 15 cm from a concave mirror of focal length 10 cm. (3)  
(b) Why does light travels faster in water in comparison to kerosene. (Refractive index of water and kerosene are 1.33 and 1.44 respectively) (2)
13. a. Which property of carbon leads to formation of large number of compounds? Define it  
b. What is the functional group in the following molecules?
  - i.  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
  - ii.  $\text{CH}_3\text{COOH}$
- c. Which of the following formula represents a saturated hydrocarbon?  
 $\text{C}_n\text{H}_{2n}$ ,  $\text{C}_n\text{H}_{2n+1}$ ,  $\text{C}_n\text{H}_{2n+2}$ ,  $\text{C}_n\text{H}_{2n-2}$
- d. What happens when methane is burnt in oxygen?
- e. Why is the conversion of ethanol to Ethanoic acid an oxidation reaction?
14. a. Give three points to distinguish between alkenes and alkynes.  
b. Explain the mechanism of cleaning action of detergents