1. The refractive index of water is 1.33 and the speed of light in air is 3×10^8 m/s. Calculate the speed of light in water? (1)

2. A person is advised to wear spectacles with concave lenses. What type of defective vision is he suffering from? (1)

3. How will you convert ethanol to ethanoic acid? (1)

4. Complete and balance the following reaction: (1)

$$CH_3COOH + Na_2CO_3 \longrightarrow$$

5. Give a common term for the pictures shown below and give its significance in evolution. (1)

6. Draw a ray diagram to show the formation of rainbow and mark the point showing -
   (i) dispersion   (ii) internal reflection. (2)

7. Explain the cleansing action of soap. (2)

8. Depict with a cross, how equal genetic contribution of male and female parents are ensured in the progeny. (2)

9. A doctor has prescribed corrective lens of power +2D. What is the nature and focal length of the lens? An object is kept at a distance of 100cm from the lens. Calculate the image distance and magnification? (3)

10. (a) What were the limitations of Newlands' law of octaves? (any two) (3)
    (b) An element belongs to third period and second group of the periodic table.
        (i) State number of valence electrons in it.
        (ii) Is it a metal or a non-metal?
        (iii) Name the element.
        (iv) Write the formula of its oxide.

11. (a) Draw a neat diagram of female reproductive system, and label the following parts: (3)
        (i) where implantation occurs   (ii) that produces eggs.
     (b) Name a sexually transmitted disease caused by bacteria and virus.

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