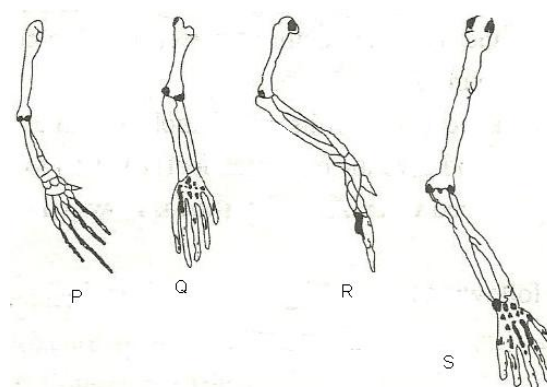1. The refractive index of diamond is 2.42 and the speed of light in air is 3×10^8 m/s. Calculate the speed of light in diamond?   (1)

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

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

4. Complete and balance the following reaction:
    $C_2H_5OH + Na \longrightarrow$ (1)

5. How do the following organs serve as an evidence for evolution?   (1)

6. Draw a diagram to show dispersion of white light by a glass prism. Label the color that appears at the two ends of the color bands.   (2)

7. What are micelles? How does the formation of a micelle help to clean the clothes?   (2)

8. Work out a cross between tall and short pea plants over two generations and answer the following:
    (a) What genetic principle is involved in the F_1?   (2)
    (b) What is the phenotypic and genotypic ratio of tall and short plants in the F2 generation?

9. (a) What were the limitations of Mendeleev's classification?(any two)   (3)
    (ii) An element X has atomic number 19.
        (a) Write its electronic configuration.
        (b) To which group of the modern periodic table does it belong?
        (c) State the nature of the compound formed by element X with chlorine.
        (d) Write the valency of element X.

10. A doctor has prescribed corrective lens of power -4D. What is the nature and focal length   (3)
    of the lens? An object is kept at a distance of 100cm from the lens. Calculate the image
    distance and magnification?

11. (a) Draw a neat diagram of female reproductive system, and label the following parts: (3)
        (i) that produces eggs,   (ii) where implantation occurs.
    (b) Name two surgical methods of contraception.

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