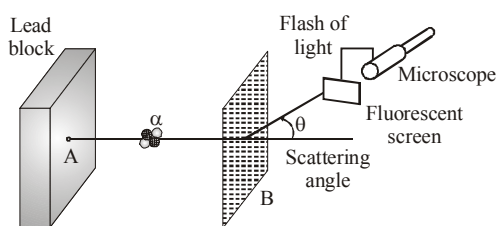


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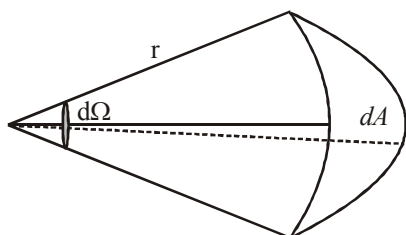
Physical World, Units AND MEASUREMENTS

Diagram Based Questions :

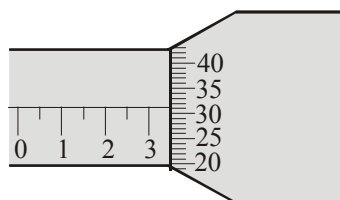
1. In Rutherford, alpha particle scattering experiment as shown in given figure, A and B refer to



- (a) polonium sample and aluminium foil
 (b) polonium sample and gold foil
 (c) uranium sample and gold foil
 (d) uranium sample and aluminium foil
2. For the given figure solid angle, $d\Omega$ is equal to



- (a) $r^2 dA$ steradian (b) dA/r^2 steradian
 (c) $\frac{r^2}{dA}$ steradian (d) dA/r steradian
3. The accompanying diagram represents a screw gauge. The circular scale is divided into 50 divisions and the linear scale is divided into millimeters. If the screw advances by 1 mm when the circular scale makes 2 complete revolutions, the least count of the instrument and the reading of the instrument in figure are respectively.



- (a) 0.01 mm and 3.82 mm
 (b) 0.02 mm and 3.70 mm
 (c) 0.11 mm and 4.57 mm
 (d) 1.0 mm and 5.37 mm
4. In a screw gauge, the zero of mainscale coincides with fifth division of circular scale in figure (i). The circular division of screw gauge are 50. It moves 0.5 mm on main scale in one rotation. The diameter of the ball in figure (ii) is

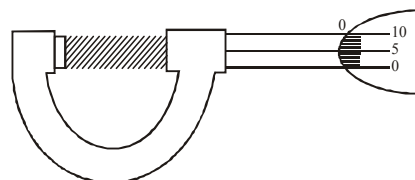


Figure (i)

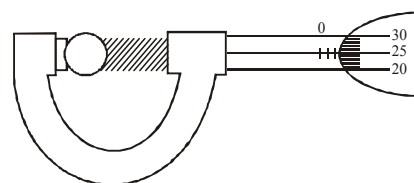


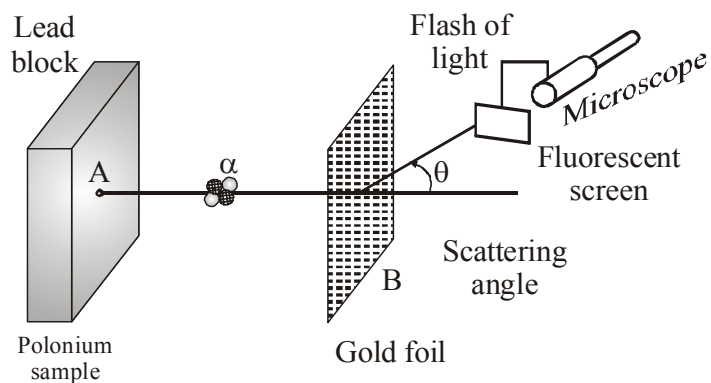
Figure (ii)

- (a) 2.25 mm (b) 2.20 mm
 (c) 1.20 mm (d) 1.25 mm



Solution

1. (b) The alpha particle scattering experiment of Rutherford gave the nuclear model of the atom as shown in figure



2. (b) 3. (a)

4. (c) Least count = $\frac{0.5}{50} = 0.01 \text{ mm}$

$$\text{Zero error} = 5 \times L.C = 5 \times 0.01 \text{ mm} \\ = 0.05 \text{ mm}$$

$$\text{Diameter of ball} = [\text{Reading on main scale}] + \\ [\text{Reading on circular scale} \times L.C] \\ - \text{Zero error} \\ = 0.5 \times 2 + 25 \times 0.01 - 0.05 = 1.20 \text{ mm}$$