Q2: An unstable heavy nucleus at rest breaks into two nuclei which move away with velocities in the ratio of 8: 27. The ratio of the radii of the nuclei (assumed to be spherical) is

(a) 3: 2

(b) 2: 3

(c) 4: 9

(d) 8: 27

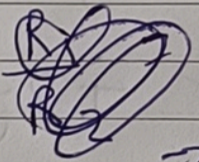**Q3** By conservation of linear momentum

$$m_1 v_1 = m_2 v_2$$

$$\frac{v_2}{v_1} = \frac{8}{27} = \frac{m_1}{m_2} = \frac{\frac{4}{3}\, 8\pi\, r_2^3}{\frac{4}{3}\, 8\pi\, r_1^3}$$

$$\frac{r_2}{r_1} = \frac{2}{3}$$

$$\Rightarrow \frac{r_1}{r_2} = \frac{3}{2}$$