4. A line with direction cosines proportional to 2, 1, 2 meets each of the lines x = y + a = z and x + a = 2y = 2z. The co-ordinates of each of the point of intersection are given by

A. (3a, 3a, 3a), (a, a, a)

B. (3a, 2a, 3a), (a, a, a)

C. (3a, 2a, 3a), (a, a, 2a)

D. (2a, 3a, 3a), (2a, a, a)

B. (3a, 2a, 3a), (a, a, a)

Any point on the line $\frac{x}{1} = \frac{y+a}{1} = \frac{z}{1} = t_1$ (say) is $(t_1, t_1 - a, t_1)$ and any point on the line $\frac{x+a}{2} = \frac{y}{1} = \frac{z}{1} = t_2$ (say) is $(2t_2 - a, t_2, t_2)$

Now direction cosine of the lines intersecting the above lines is proportional to $(2t_2 - a - t_1, t_2 - t_1 + a, t_2 - t_1)$.
Hence $2t_2 - a - t_1 = 2k$, $t_2 - t_1 + a = k$ and $t_2 - t_1 = 2k$

On solving these, we get $t_1 = 3a$, $t_2 = a$. Hence points are (3a, 2a, 3a) and (a, a, a).