QUES 01:-

The ranges and heights for two projectiles projected with the same initial velocity at angles $42°$ and $48°$ with the horizontal are R_1, R_2 and H_1, H_2 respectively. Choose the correct option : [Sep. 1, 2021 (II)]

(a) $R_1 > R_2$ and $H_1 = H_2$
(b) $R_1 = R_2$ and $H_1 < H_2$
(c) $R_1 < R_2$ and $H_1 < H_2$
(d) $R_1 = R_2$ and $H_1 = H_2$

(b) For projectile motion,

$$\text{Range } R = \frac{u^2 \sin 2\theta}{g}$$

As range is same for angle of projection θ and $90-\theta$. So, range is same for $42°$ and $48°$.

$$\text{Height in projectile motion, } H = \frac{u^2 \sin^2 \theta}{2g}$$

$$\Rightarrow H \propto \sin^2 \theta$$

So H is higher for $48°$ than H for $42°$.