Q. 05
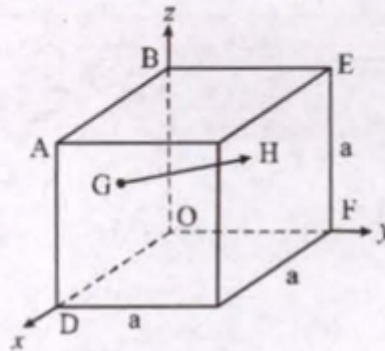
In the cube of side 'a' shown in the figure, the vector from the central point of the face ABOD to the central point of the face BEFO will be: [Main 10 Jan. 2019 (I)]

(a) $\dfrac{1}{2}a\left(\hat{k}-\hat{i}\right)$

(b) $\dfrac{1}{2}a\left(\hat{i}-\hat{k}\right)$

(c) $\dfrac{1}{2}a\left(\hat{j}-\hat{i}\right)$

(d) $\dfrac{1}{2}a\left(\hat{j}-\hat{k}\right)$

(c) From figure,

$$\vec{r}_G = \frac{a}{2}\hat{i} + \frac{a}{2}\hat{k} \implies \vec{r}_H = \frac{a}{2}\hat{j} + \frac{a}{2}\hat{k}$$

$$\therefore \vec{r}_H - \vec{r}_G = \left(\frac{a}{2}\hat{j} + \frac{a}{2}\hat{k}\right) - \left(\frac{a}{2}\hat{i} + \frac{a}{2}\hat{k}\right) = \frac{a}{2}\left(\hat{j}-\hat{i}\right)$$