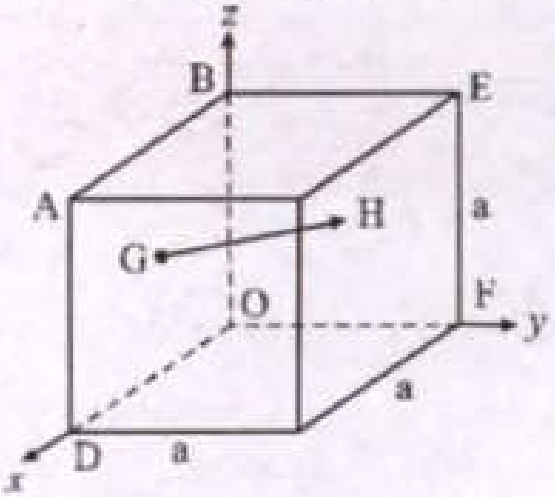
5. In the cube of side 'a' shown in the figure, the vector from the central point of the face ABOD to the central point of the face BEFO will be: [Main 10 Jan. 2019 (I)]



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

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

ans

(c) From figure,

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

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