1 **JEE Main 2017 (Offline)**

MCQ (Single Correct Answer)

If $(2+\sin x)\frac{dy}{dx}+(y+1)\cos x=0$ and y(0) = 1,

then $y\left(\frac{\pi}{2}\right)$ is equal to

A $-\frac{2}{3}$

B $-\frac{1}{3}$

C $\frac{4}{3}$

D $\frac{1}{3}$

Explanation

$(2+\sin x)\frac{dy}{dx}+(y+1)\cos x=0$

$\Rightarrow \frac{d}{dx}(2+\sin x)(y+1)=0$

On integrating, we get

(2 + sin x) (y + 1) = C

At x = 0, y = 1 we have

(2 + sin 0) (1 + 1) = C

$\Rightarrow$ C = 4

$\Rightarrow (y+1)=\frac{4}{2+\sin x}$

$\Rightarrow$ y = $\frac{4}{2+\sin x}-1$

Now $y\left(\frac{\pi}{2}\right)=\frac{4}{2+\sin\frac{\pi}{2}}-1$

= $\frac{4}{3}-1$ = $\frac{1}{3}$