

Problem 1:

If  $x, y \in [-1, 0]$  and  $[\cdot]$  represents the greatest integer function, find the maximum value of  $[\cos^{-1}x] + [\cot^{-1}y]$ .

- (a) 2       (b) 5      (c) 3      (d) 4.

Solution:

$$-1 \leq x \leq 0 \Rightarrow \frac{\pi}{2} \leq \cos^{-1}x \leq \pi.$$

$$\Rightarrow [\cos^{-1}x] = 1, 2 \text{ or } 3.$$

$$-1 \leq y \leq 0 \Rightarrow \frac{\pi}{2} \leq \cot^{-1}y \leq \frac{3\pi}{4}.$$

$$\Rightarrow [\cot^{-1}y] = 1 \text{ or } 2$$

So, maximum possible value is  $3 + 2 = (5)$