Question : The perimeter of a rectangle, a square and a circle are all equal. Whose area is the maximum?

(1) Rectangle (2) Square (3) Circle (4) All are same

Answer : choice (3) .

SOLUTION : Let us first consider a square and a rectangle.

Both have perimeter of P meters.

$2(L + B) = P$ .....(1)

Side of the square = P/4 m.....(2)

Area of the square = $(P^2 / 16)$

If L = B = P/4 then it becomes the square.

Instead if L = P/3 and B = P/6 then perimeter is P and area is $(P^2 / 18)$ which is less than $(P^2 / 16)$. For any other value other than P/4 the rectangle has more area. Therefore always it can be understood that the square has more area.

Now comparing the square and the circle,

$2 \pi R = P$; Radius of the circle = $P / (2 \pi)$

Area of the circle = π X R X R = π X $(P / 2 \pi)$ X $(P / 2 \pi)$

= $P^2 / (4 X 3.142)$ which is more than $(P^2 / 16)$.

So the circle has maximum area.