Let $f(n) = n$ and $g(n) = 2^{\sqrt{\log n}}$. Circle one of the following alternatives:

$$f \text{ is } o(g) \qquad \boxed{g \text{ is } o(f)} \qquad f \text{ is } \Theta(g)$$

Justify your answer.

Solution: g is $o(f)$ because

$$\frac{g(n)}{f(n)} = \frac{2^{\sqrt{\log n}}}{n} = \frac{2^{\sqrt{\log n}}}{2^{\log n}} = 2^{\sqrt{\log n}(1-\sqrt{\log n})} \to 2^{-\infty} = 0.$$