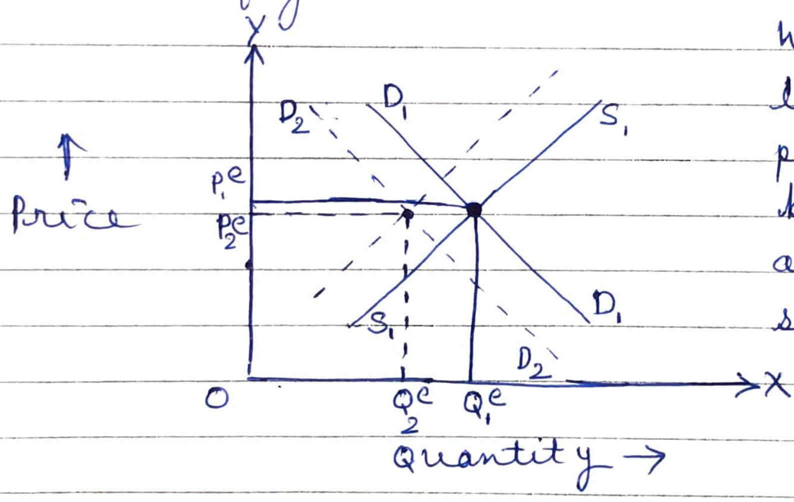
Q. Firstly, we will try to understand the question then we would discuss each option. Here, four cases have been given and under each of the cases, we have to analyze in which case will not change the equilibrium output.

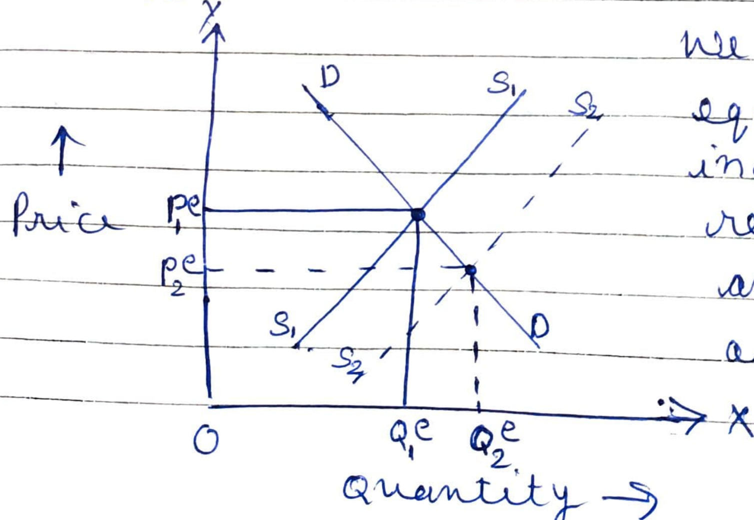
So, suppose that initially, there exists an equilibrium.

Now, if (i) Demand decreases and supply decreases. then equilibrium output and price both will change as shown in the fig.



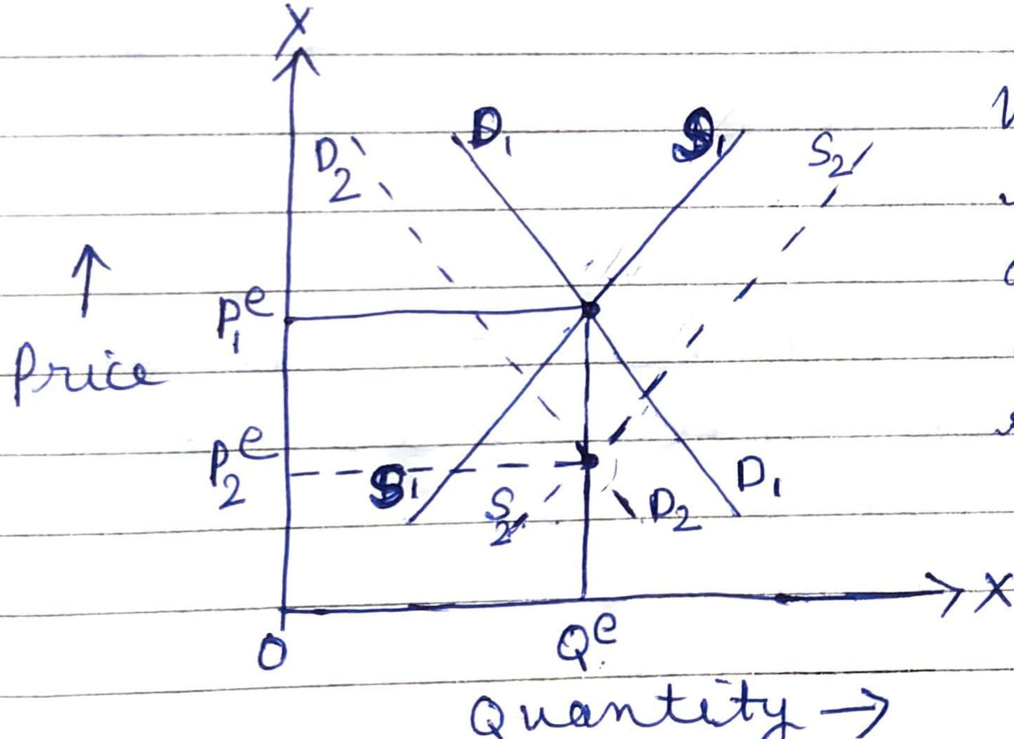
We can see that equilibrium output and price both decreases as demand and supply decreases.

(ii) Demand remains constant and supply increases.



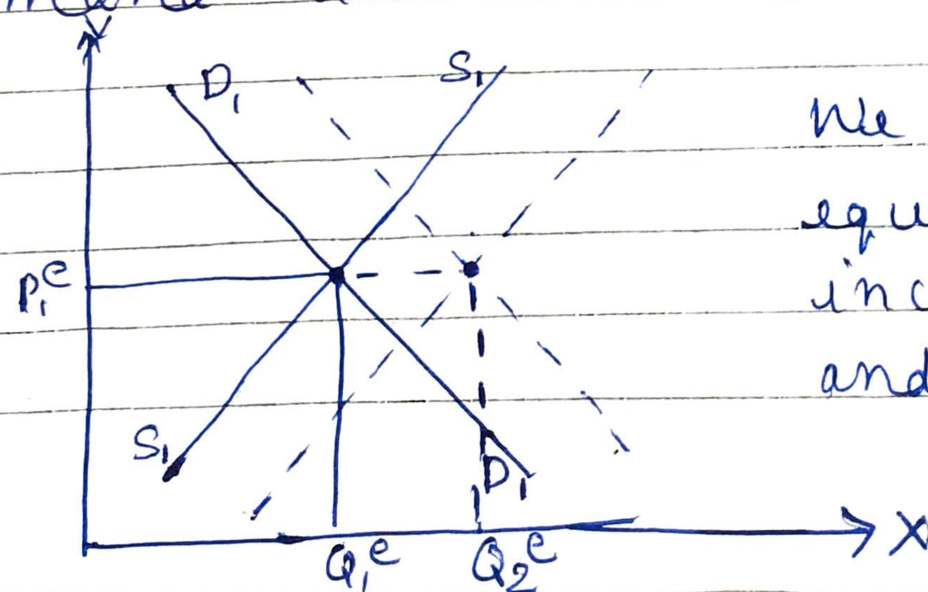
We can see that equilibrium output increases as demand remains constant and supply increases.

(iii) Demand decreases and supply increases



We can see that equilibrium output does not change as demand ~~and supply~~ decreases and supply increases.

(iv) Demand increases and Supply increases



We can see that equilibrium output increases as demand and supply both increases.

Hence, we have found only one case where the equilibrium output does not change where demand decreases and supply increases.

So, the option (iii) is correct.