Scenario 1 :-

The glass jar continues the table edge, the carpet just slides off the table & at that instant, the jar has velocity less than carpet. Time for carpet to slide off is $\frac{l}{V_c}$. Now, in this duration, the displ. of jar is $\frac{1}{2}(\mu g)\frac{l^2}{V_c^2}$.

So, $\frac{1}{2}(\mu g)\frac{l^2}{V_c^2} = x$

$V_c^2 = \frac{\mu g l^2}{2x}$. Now,

in this duration, the velocity of jar must be less than velocity of carpet to prevent falling.

$$\mu g\left(\frac{l}{v_c}\right) < v_c. \qquad v_c^2 > \mu g l$$

So, $\frac{\mu g l}{2x} > \mu g$

$$\boxed{x < \frac{l}{2}}$$

So, this is possible only if $x < \frac{l}{2}$.

So, limiting velocity of carpet for this case is

$$v_c > \sqrt{\frac{\mu g x^2}{2x}}, \quad x < \frac{l}{2}.$$

The other scenario is the jar falls off the carpet before carpet slides off the table. From carpet frame, the time taken for jar to fall off is

$$(V_c)t - \frac{1}{2}\mu g t^2 = (l - x).$$

Now, we have to ensure that when jar reaches end of carpet, its velocity is less than carpet. So,

$$(\mu g t) < V_c.$$

$$-\left(\frac{\mu g}{2}\right)t^2 + (V_c)t - (l-x) = 0$$

For real 't' to exist,

$$V_c^2 > 4\left(\frac{\mu g}{2}\right)(l-x)$$

$$V_c > \sqrt{2\mu g(l-x)}$$. Now,

for this duration, $t < \frac{l}{V_c}$.

Also, $t < \frac{V_c}{\mu g}$.

$$(\mu g)\left(\frac{l}{V_c}\right) < V_c \qquad \boxed{V_c^2 > \mu g l}$$

Since the previous scenario was possible only when $x < l/2$.

This above mentioned case will be valid only when x is greater than $l/2$. So finally, the cond. for successful demonstration of exp will be

$$V_c > \sqrt{\frac{\mu g l^2}{2x}}, \quad x < \frac{l}{2},$$

$$V_c > \sqrt{2\mu g(l-x)}, \quad x > \frac{l}{2}$$