→ Joint Probability Density Function for the continuous RV's X & Y satisfies :

(i) $f_{XY}(x,y) \geq 0 \quad \forall\ x, y$

(ii) $\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} f_{XY}(x,y)\,dx\,dy = 1$

(iii) $\forall$ region $R \in 2D$, $P((X,Y) \in R) = \iint_R f_{XY}(x,y)\,dx\,dy$