Q.2. Construct $a_{2\times 2}$ matrix where

(i) $a_{ij} = \frac{(i-2j)^2}{2}$ (ii) $a_{ij} = |-2i+3j|$

Sol.(i) We have, $A = [a_{ij}]_{2\times 2}$

Such that, $a_{ij} = \frac{(i-2j)^2}{2}$; where $1 \le i \le 2$, $1 \le j \le 2$.

$\therefore a_{11} = \frac{(1-2)^2}{2} = \frac{1}{2}$ $a_{12} = \frac{(1-2\times 2)^2}{2} = \frac{9}{2}$

$a_{21} = \frac{(2-2\times 1)^2}{2} = 0$ $a_{22} = \frac{(2-2\times 2)^2}{2} = 2$

So, $A = \begin{bmatrix} \frac{1}{2} & \frac{9}{2} \\ 0 & 2 \end{bmatrix}$.

(ii) We have; $A = [a_{ij}]_{2\times 2}$

Such that $a_{ij} = |-2i+3j|$; where $1 \le i \le 2$, $1 \le j \le 2$

$\therefore a_{11} = |-2\times 1 + 3\times 1| = 1$ $a_{12} = |-2\times 1 + 3\times 2| = 4$

$a_{21} = |-2\times 2 + 3\times 1| = 1$ $a_{22} = |-2\times 2 + 3\times 2| = 2$

$\therefore A = \begin{bmatrix} 1 & 4 \\ 1 & 2 \end{bmatrix}$.