Question:

Following is given a joint probability distribution for discrete random variables X and Y:

		Y			
		1	2	3	4
X	1	6/30	3/30	2/30	4/30
	2	4/30	2/30	4/30	0
	3	2/30	1/30	0	2/30

A. Calculate marginal probability of X i.e. g(x).
B. Calculate marginal probability of Y i.e.. h(y).
C. Calculate H(3).
D. Calculate g(1).

Ans:

		Y				g(x)
		1	2	3	4	
X	1	6/30	3/30	2/30	4/30	15/30
	2	4/30	2/30	4/30	0	10/30
	3	2/30	1/30	0	2/30	5/30
h(x)		12/30	6/30	6/30	6/30	1

A. Calculate marginal probability of X i.e. g(x).

X	g(x)
1	15/30
2	10/30
3	5/30

B. Calculate marginal probability of Y i.e.. h(y).

X	hx)
1	12/30
2	6/30
3	6/30
4	6/30

C. Calculate H(3).

$$¿\sum_{x=1}^{3} f(x,3)$$ (1,3),(2,3),(3,3)

g(3) = 2/30+4/30+0 = 6/30 = 1/5

D. Calculate g(1).

$$¿\sum_{y=1}^{4} f(1,y)$$ (1,1),(1,2),(1,3),(1,4)

g(1) = 6/30+3/30+2/30+4/30 = 15/30 = 1/2