Ⓥ Fractional knapsack Problem (Solved by Greedy Method)

There are 3 approaches of selecting the items :-

① Max. profit approach.
② Min. weight approach (to select more items)
③ $\left(\dfrac{Profit}{weight}\right)$ max approach.

Soln

Objects –	1	2	3	4	5	6	7	$W = 15$
Profit (P) –	5	10	15	7	8	9	4	$n = 7$
Weight (w) –	1	3	5	4	1	3	2	
p/w →	5	3.3	3	1.75	8	3	2	

1st approach (Max profit)

Objects	Profit (P)	Weight (w)	Remaining Weight
3	15	5	$15 - 5 = 10$
2	10	3	$10 - 3 = 7$
6	9	3	$7 - 3 = 4$
5	8	1	$4 - 1 = 3$
4	$7 \times \dfrac{3}{4}$ $= \dfrac{21}{4} = 5.25$	3	$3 - 3 = 0$
			Total P = 47.25

2nd approach (min weight)

1	5	1	$15 - 1 = 14$
5	8	1	$14 - 1 = 13$
7	4	2	$13 - 2 = 11$
2	10	3	$11 - 3 = 8$
6	9	3	$8 - 3 = 5$
4	7	4	$5 - 4 = 1$
3	$15 \times \dfrac{1}{5} = 3$	1	$1 - 1 = 0$
			Total P = 46

3rd approach (max p/w ratio)

5	8	1	$15 - 1 = 14$
1	5	1	$14 - 1 = 13$
2	10	3	$13 - 3 = 10$
3	15	5	$10 - 5 = 5$
6	9	3	$5 - 3 = 2$
7	4	2	$2 - 2 = 0$
			Total P = 51 ✓