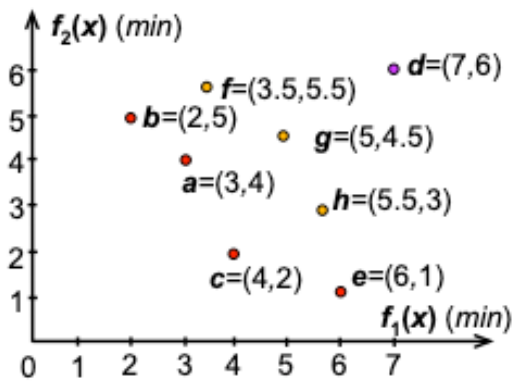


## DECISION ANALYSIS – SHORT EXERCISES XI – CLASSICAL METHODS FOR MULTIPLE OBJECTIVE OPTIMIZATION

I. Consider a set of solutions **a-h** in the objective space with two minimized objectives (see figure below).



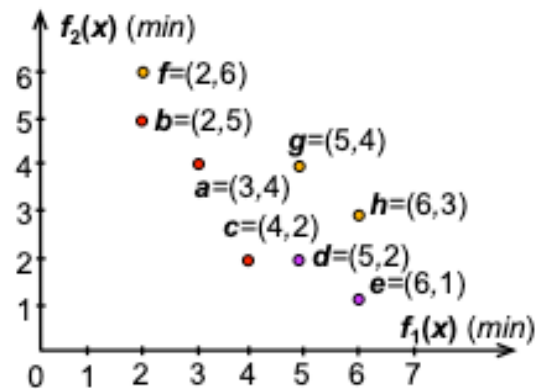
a) Compute the ideal point  $\mathbf{z}^{\text{ideal}}$ .

(2,1) infeasible

b) Compute the max point  $\mathbf{z}^{\text{max}}$ .

d=(7,6)

II. Consider a set of solutions **a-h** in the objective space with two minimized objectives (see figure below).



a) Identify weakly Pareto optimal solutions.

e=(6,1), f=(2,6)

b) What would be the solution returned by **WSM** with the following objective function: **Minimize**  $0.5 \cdot f_1(x) + 0.5 \cdot f_2(x)$ ?

c=(4,2)  $0.5 \cdot 4 + 0.5 \cdot 2 = 3$

c) What would be the solution returned by **ECM** with the following objective function and constraint: **Minimize**  $f_1(x)$ , s.t.  $f_2(x) \leq 4.5$ ?

a=(3,4)