Some Corrections to the Foundations of Combinatorial Optimization

1. p.7, l.5, change "$a'_{36} \neq 0$" to "$a'_{37} \neq 0$".
2. p.11, in Theorem (Greedy characterization of matroids), define a base of an independence system to be a maximal independent set.
3. p.17, l.12, change "$\mathbf{R}^{2^{E(G)}}$" to "$\mathbf{R}^{2^{E(M)}}$"
4. p.21, l.10, "notice that $J + e$ contains a unique circuit".
5. p.21, last line, "by noting that $\alpha = 0$ would imply $\mathcal{F}(T) = \mathcal{P}_{\mathcal{I}(M)}$, and $\alpha < 0$ would imply $T = \emptyset$."
6. p.24, Bellman-Ford Algorithm, step 2, I think you must state "$f_k(w) := \min(\{f_{k-1}(w)\} \cup \{f_{k-1}(t(e)) + c(e) : e \in \delta_G^-(w)\})$".
7. p.26, l.5 from the bottom, "At any stage of the algorithm".
8. p.28, try to clarify the statement, "It cannot be that w^* must be used by such an F' before the last interior vertex j, because (a) implies that there is a minimum-weight v-j dipath that does not use w^*."
9. p.29, Knapsack Problem/Exercise. I suggest in (a) giving a knapsack problem in which the slack variable is necessarily positive in the optimal solution.
10. p.33, l.−10, "that is, those induced by the rigid motions of $\mathbf{R}^d$".
11. p.35, l.6, "for any pair of matroids M_1, M_2".
12. p.46, in the Exercise, "$\mathcal{P}_{\mathcal{I}(M_1)} \cap \mathcal{P}_{\mathcal{I}(M_2)} \cap \mathcal{P}_{\mathcal{I}(M_3)}$".
13. p.49, line before Section 4.1, "minimum-weight matchings".
14. p.50, l.−10. I think this should say "there is some (alternating) path of $G.C$ with more vertices in Y than in X".
15. p.52, in Claim 1, mention that $S^1|_{G_1} \cup S^2|_{G_2}$ is a maximizing matching for α.
16. p.62, in the definition of Eulerian tour, specify that the directed walk must be closed.
17. p.67, l.3, "optimization".

18. p.73, l.19, “therefore $\sigma_i^k \leq \sigma_i^{k+1}$”.
19. p.73, l.-5, “Let’s”.
20. p.79, in the Example, “The choice of $u_1 = 0$, $u_2 = 1/2$, $u_3 = 1/2$ yields the cutting plane $-5x_1 - 3x_2 \leq -13$.”
21. p.85, equation ($\overline{2}$), change “$\frac{15}{22}$” to “$\frac{7}{22}$”.
22. p.93, l.1, “Assume that the data for IP”.
23. p.94, l.2, “is z^*.”
24. p.94, l.-6, “is not too large”.
25. p.95, first line of Proof, “is a feasible solution”.
26. p.95, fourth line of Proof, “are satisfied by x^*”.
27. p.98, l.4, “lifting the coefficients of x_1 and x_5” (double check this).
28. p.100, l.2, “with respect to the”.
29. p.106, Problem, l-2, change “more than” to “at least”. (This only makes a difference in the case $n = 1$.)
30. p.109, reverse the arc with cost 5/6 to go from 5 to 0.
31. p.109, l-8, “from vertex 4 to vertex 1”.
32. p.110, fourth line before the Exercise, “potential”.
33. p.110, just before the Exercise, clarify the branching procedure for the knapsack problem.
34. p.113, definition of $f(S)$, I think this should be “$f(S) := r_M(S) - \sum_{e \in S} x_e^*$.”
35. p.114, l-7, “$f'(x) := \sum_{j=1}^{m} \lambda_j f(S(x^j))$”.
36. p.115, l.2, “coefficients. Therefore”.
37. p.115, you need a summation on the right-hand side of both inequalities ($* \leq$) and ($* <$).
38. p.127, l.-3, “$\sum_{i=1}^{m} y_i a_{ij} = 0$, for $j = 1, 2, \ldots, n$”.