

NMSA413 Optimization Theory

Thematic rings for the exam:

1. Separation of sets.
T1.43 with proof, T1.44 with proof, T1.45 with proof, D1.48, T1.53 with proof, T1.54 without proof
2. Farkas' lemma, its relation to duality in LP.
T1.59 with proof, Ex2.42
3. LP - formulation, allowed transformations, set of all feasible solutions.
whole section 2.1, D2.1, L2.2 with proof
4. LP - existence of an optimal solution.
T2.15 with proof
5. Basic theorem of LP.
T2.21 without proof, L2.23 without proof, L2.25 without proof, T2.26 with proof, T2.30 with proof, T2.31 without proof
6. LP - weak duality.
dual pair, symmetric dual pair, T2.33 with proof, T2.34 with proof
7. LP - strong duality.
T2.35 with proof, T2.36 with proof, T2.37 without proof
8. FONC and FOSC for a MP with convex objective function and convex set of feasible solutions.
T4.1 with proof
9. FONC for a MP with concave objective function and convex set of feasible solutions.
T4.5 with proof
10. FONC, FOSC, SONC, SOSC for a MP with differentiable objective function and an inner point of feasible solutions.
T4.10 with proof, T4.11 with proof, T4.12 without proof, T4.13 without proof
11. MP - general setup.
D4.14, D4.17, T4.20 with proof, D4.21
12. Saddle point condition and FOSC for a general NLP.
D5.4, T5.5 with proof

13. Saddle point condition and FONC for a general NLP.
D5.4, D5.9, T5.10 without proof
14. Localized saddle point condition, FONC and FOSC for a general NLP.
D5.11, T5.12 without proof, D5.13, T5.14 without proof
15. KKT optimality conditions, basic theorem on KKT.
D5.17, D5.18, T5.19 with proof, D5.20, D5.21, T5.23 with proof, R5.47
16. K-T constraint qualifications, FONC, FOSC for a general NLP.
L5.24 without proof, D5.25, T5.27 with proof, T5.35 without proof
17. Constraint qualifications.
D5.28, T5.29 without proof, T5.30 without proof, D5.31, T5.32 without proof
18. SONC and SOSC for a general NLP.
D5.36, T5.37 without proof, D5.38, T5.39 without proof
19. Saddle point condition and KKT for a symmetric NLP.
D6.1, D6.2, T6.3 without proof, T6.4 with proof, T6.5 with proof, T6.8 without proof, T6.9 without proof

January 2, 2024

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