

## GROUP DECISION MAKING UNDER MULTIPLE CRITERIA

### FINAL EXAM – PART 2

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Duration: 60 minutes.

### QUESTIONS

1. (10 pts.) Suppose that Phd students will select a representative. There are four candidates for the position. As most of the students get the *GDM under Multiple Criteria* course, they collect the votes of the students using a preferential voting system (i.e., voter provide ranking of the candidates rather than a single vote). Among Schulze Method (Schulze, 2011), Copeland's function, and Borda's function, which method would you suggest for selecting the representative? Explain advantages and disadvantages of these methods, and give reasons of your suggestion.
2. (10 pts.) What are the differences between criteria based assessment and alternative based assessment? Give one example paper for each type of assessment from the list of presentation papers.
3. (10 pts.) Explain the differences among the classical TOPSIS, the A-TOPSIS and the M-TOPSIS methods based on Tavana and Hatami-Marbini (2011).
4. (10 pts.) Compare peer-to-peer dynamic adaptive consensus reaching process of Dong and Cooper (2016) and consensus process in Cabrerizo et al. (2010). What are the similarities and differences of these processes? What is the advantage/disadvantage of peer-to-peer concept?
5. (10 pts.) Classify Heravi et al. (2017)'s paper based on the classification scheme presented in Kabak and Ervural (2017).

### References:

- Schulze, M. (2011). A new monotonic, clone-independent, reversal symmetric, and condorcet-consistent single-winner election method. *Social Choice and Welfare*, 36(2), 267-303.
- Tavana, M., & Hatami-Marbini, A. (2011). A group AHP-TOPSIS framework for human spaceflight mission planning at NASA. *Expert Systems with Applications*, 38(11), 13588-13603.
- Qingxing Dong, Orrin Cooper, A peer-to-peer dynamic adaptive consensus reaching model for the group AHP decision making, *European Journal of Operational Research*, 250, 521-530,
- F. J. Cabrerizo, J. M. Moreno, I. J. Perez, E. Herrera-Viedma (2010) Analyzing consensus approaches in fuzzy group decision making: advantages and drawbacks, *Soft Computing* 14, 451–463
- Heravi, G., Fathi, M., Faeghi, S. (2017). Multi-criteria group decision-making method for optimal selection of sustainable industrial building options focused on petrochemical projects. *Journal of Cleaner Production*, 142, 2999-3013.
- Kabak, Ö., Ervural, B. (2017). Multiple Attribute Group Decision Making: A generic conceptual framework and a classification scheme. *Knowledge-Based Systems*, 123, 13-30