

## GROUP DECISION MAKING UNDER MULTIPLE CRITERIA

### 2017-2018 FINAL EXAM – PART 2

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*You may use lecture notes and other sources as well as your computer for pdf documents and mathematical calculations.*

*Please turn off internet property of your computer!*

*Duration: 70 minutes.*

(The first part of the exam – take home – is worth 60 points)

### QUESTIONS

1. (10 pts.) We will have a presidential election in Turkey on 24<sup>th</sup> June, 2018. Which method is used to select the president in Turkey? What may be the other alternative methods? Give two alternative methods and explain advantages and disadvantages of all three methods.

2. (20 pts.) Suppose that the overall preferences of decision makers in a multiple attribute group decision making problem is calculated as follows (all values are in 1-10 scale, no need to normalize):

Alternatives	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>
x <sub>1</sub>	4.3	6.5	8.2
x <sub>2</sub>	8.5	6.3	6.8
x <sub>3</sub>	7.4	4.6	3.7
x <sub>4</sub>	6.5	8.1	2.3

- Calculate a collective preference of the group using an OWA operator assuming the OWA weights are (0.1, 0.3, 0.6).
- Calculate the consistency of the individual preference values given by the second decision maker (D<sub>2</sub>) with respect to collective preference. Use the Definition 3 at Pang and Liang (2012).

3. (10 pts.) What are the differences and similarities between “soft coincidence” and “strict coincidence” in the consensus models. Explain with an example.

4. (10 pts.) Classify and explain the properties of group decision making approach in Banaeian et al. (2017) based on the classification scheme presented in Kabak and Ervural (2017).

### References:

- Banaeian N., Mobli H., Fahimnia B., Nielsen I., and Omid M., (2016) Green Supplier Selection Using Fuzzy Group Decision Making Methods: A Case Study from the Agri-Food Industry, *Computers and Operation Research* , 89, January 2018, 337-347.
- Pang, J., Liang. J. (2012) Evaluation of the results of multi-attribute group decision-making with linguistic information. *Omega* 40 , 294–301.
- Kabak, Ö., Ervural, B. (2017). Multiple Attribute Group Decision Making: A generic conceptual framework and a classification scheme. *Knowledge-Based Systems*, 123, 13-30