Cairo University	Cairo University – Institute Of Statistical Studies And Researches			
	Department: Information Technology			
	Academic Year: 2017/2018 Semester: 1			
	Date: 25/2/2018 Level: Pre Doctoral			
Course Title: Selected Topics in Information Systems	**Course code:** IT703	**Time:** 3 Hours	**Exam marks:** Max 60	**# Exam. Sheets:** 2
Exam. Instructions : Answer all questions				

Question One: (10 Marks)

a) Compare between Information Retrieval (IR), Information Extraction (IE) and Question Answering (QA) systems. Explain how QA systems benefit from IR and IE techniques. *(3 marks)*

b) Briefly describe passage retrieval phase in the above model. What are the most common features used for rule-based passage scoring classifier? *(3 marks)*

c) Discuss some problems in using pattern matching to solve the answer extraction task in IR-based question answering and describe a potential solution. *(4 marks)*

Question Two: (10 Marks)

a) Compare between IR-based and knowledge-based question answering approaches in terms of typical system components and resources they use. *(3 marks)*

b) Which one of the above approaches is more suitable for visual question answering? Justify your answer. *(3 marks)*

c) Describe an approach for visual question answering using neural networks focusing on how they are used and constructed. *(4 marks)*

Question Three: (10 Marks)

a) Discuss the importance of relation extraction in question answering. *(3 marks)*

b) Discuss one problem in bootstrapping technique for relation extraction and try to find a potential solution. *(4 marks)*

c) Describe one technique to represent free-text question as more structured form so it can be used to search for an answer in knowledge bases. *(3 marks)*

Question Four: (10 Marks)

a) Define Answer Sentence Selection and Answer Justification problems in IR-based question answering systems and discuss their effect on system performance. *(4 marks)*

b) Enhanced Lexical Semantic models proposed by Wen-tau et al (2013) are claimed to be more efficient than semantic parsing in solving the above problems. Describe their models and compare them with semantic parsing in terms of computational complexity and performance *(6 marks)*

Question Five: (10 Marks)

a) Discuss the vocabulary mismatch problem in IR-based question answering systems and its impact on system performance. *(3 marks)*

b) Describe three approaches to solve the above problem suitable for open-ended question answering system. *(3 marks)*

c) Discuss drawbacks of query expansion approach for solving the above problem, describe and discuss the proposed approach to alleviate this problem by Saeedeh et al (2017). *(4 marks)*

Question Six: (10 Marks)

a) Jovita et al (2015) proposed a vector space model for question answering system, describe their approach and discuss its results regarding accuracy and runtime speed. *(4 marks)*

b) In your opinion, what is the main drawback in the above approach and what caused it? *(3 marks)*

c) Do you think recall is a good metric measure question answering system performance? Why or why not? If not, what is the best metric in your opinion and why? *(3 marks)*

Best Wishes **Assoc. Prof. Mervat Gheith**

Dr. Waleed Arafa