

**Mid-term Examinations**  
**CSE508: Information Retrieval**

**Date: 26 Feb 2023**  
**Time: 10-11 am**

**Name:**

**Roll Number:**

**Instructions**

- It is a close book examination
- All questions are mandatory
- Calculator is not allowed
- There is no negative marking
- MCQ questions (2 marks each) may have more than one correct answers
- Short and long descriptive answers are of 3 and 5 marks, respectively
- There are total 8 questions (3 MCQs, 3 short answers, and 2 long answers)
- Maximum score is 25 marks  $[3 \times 2 + 3 \times 3 + 2 \times 5]$

**All the best!**

**Section A: MCQs [2 marks each]**

**Q1)** Mark all True sentences.

- A. Traditional Inverted Indexes are more powerful than Positional Inverted Indexes.
- B. Positional Inverted Indexes are more powerful than Traditional Inverted Indexes.
- C. Traditional Inverted Indexes require more computation than Positional Inverted I.
- D. Positional Inverted Indexes require more computation than Traditional Inverted I.

**Q2)** Which of the following is true for the query, mercy AND Caesar AND

	Antony and Cleopatra	Julius Caesar	The Tempest	Hamlet	Othello	Macbeth
Antony	1	1	0	0	0	1
Brutus	1	1	0	1	0	0
Caesar	1	1	0	1	1	1
Calpurnia	0	1	0	0	0	0
Cleopatra	1	0	0	0	0	0
mercy	1	0	1	1	1	1
worser	1	0	1	1	1	0

- A. 101100
- B. 100111
- C. 110011
- D. 100011

**Q3)** Which of the following cannot be input for an information retrieval system.

- A. Text
- B. Audio
- C. Image
- D. Gesture
- E. None of the above

**Section B: Short Answers [3 marks each]**

**Q4)** Describe Information Search, Information Retrieval, and Data Retrieval with an example.

**Q5)** List the issues/challenges in the information retrieval system.

**Q6)** What are the benefits of creating an inverted index for indexing documents in an information retrieval system? Explain with an example.

**Section C: Detailed Answers [5 marks each]**

**Q7)** What do you mean by web co-pilot? Why do we need the same? List down the benefits and limitations of web co-pilot with a real-world example.

**Q8)** Google claims to have a better information retrieval system than Microsoft. For a given query, returns the following 5 documents: d1, d2, d3, d4, and d5, with their relevance scores 0, 2, 1, 4, 2, respectively (a higher score indicates more relevant to the given query). New Bing + OpenAI based system returns the following results for the same query: d4, d1, d2, d3, d5. Old Bing returns the following documents: d1, d2, d4, d3, and d5 for the same query. Compare all IR systems based on DCG and NDCG metrics. For your reference, DCG is defined as follows:

$$DCG_p = rel_1 + \sum_{i=2}^p \frac{rel_i}{\log_2 i}$$

Additionally,  $\log_2 3$  and  $\log_2 5$  (all on base 2) are 1.59 and 2.32, respectively.