Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 19 / 12/ 2025 **Time: 01:00pm – 04:00pm**

School: PSCS	**Program: ISE**	
Course Code: ISE2502	**Course Name: Information Retrieval**	
Semester: 5th	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**24**	**24**	**26**	**26**	**-**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Describe information need.	**2 Marks**	**L2**	**CO1**
2.	Explain query reformation with a simple example.	**2 Marks**	**L2**	**CO1**
3.	Describe inverted indexing.	**2 Marks**	**L2**	**CO2**
4.	Explain the need of reference collection.	**2 Marks**	**L2**	**CO2**
5.	Describe forward indexing with example	**2 Marks**	**L2**	**CO3**
6.	List any two challenges in indexing and searching	**2 Marks**	**L1**	**CO3**
7.	Explain near duplicate with example	**2 Marks**	**L2**	**CO3**
8.	List any three types of recommender systems.	**2 Marks**	**L1**	**CO4**
9.	Differentiate data sources and knowledge sources used in recommender systems.	**2 Marks**	**L2**	**CO4**
10.	List the advantages and limitations of CBF	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Interpret the architecture of a system designed to handle indexing, searching, and retrieval from large datasets and explain its working.	**10 Marks**	**L2**	**CO1**
	b.	Summarize the key milestones in development of information retrieval	**10 Marks**	**L2**	**CO1**
		Or			
12.	**a.**	Explain in detail the applications of Information retrieval with suitable examples.	**10 Marks**	**L2**	**CO1**
	b.	Differentiate data retrieval and information retrieval with appropriate examples.	**10 Marks**	**L2**	**CO1**

13.	**a.**	Explain in detail various approaches to user-based evaluation.	**10 Marks**	**L2**	**CO2**
	b.	Apply Boolean retrieval models for the given corpus and queries and list the retrieved documents by the model. • D1: "Python programming is widely used in data science" • D2: "C programming is suitable for system software" • D3: "Java programming is used in enterprise applications" • D4: "Python and machine learning work together" Query 1: Python AND programming Query 2: (Java OR C) AND NOT Python Query 3: Programming AND (data OR applications) Query 4: Machine AND learning Query 5: (Python OR Java) AND (science OR enterprise)	**10 Marks**	**L3**	**CO2**
		Or			
14.	**a.**	Differentiate system-based evaluation and user-based evaluation	**10 Marks**	**L2**	**CO2**
	b.	Compute Precision, Recall, F1-score, Precision@7 and fallout for the confusion matrix: Relevant (Actual) — Not Relevant (Actual) Retrieved — TP = 15 — FP = 5 Not Retrieved — FN = 5 — TN = 25	**10 Marks**	**L3**	**CO2**

15.	**a.**	, Explain the working if web crawlers with an architecture diagram	**10 Marks**	**L2**	**CO3**
	b.	Find the intersection of the two posting lists given below to determine documents that include both "machine" and "learning." Posting List 1 (Term: "machine") [2, 4, 5, 7, 9, 10, 13, 16] Posting List 2 (Term: "learning") [1, 4, 5, 8, 10, 12, 14, 16]	**10 Marks**	**L3**	**CO3**
		Or			
16.	**a.**	Explain types of indexing in detail.	**10 Marks**	**L2**	**CO3**
	b.	Text (T): ABACABABCABAB Pattern (P): ABABCAB Tasks: 1. Compute the LPS table for the pattern. 2. Perform detailed KMP matching showing when mismatches occur and which LPS values are used.	**10 Marks**	**L3**	**CO3**

17.	**a.**	Describe in detail the working principle of a content-based recommender system.	**10 Marks**	**L2**	**CO4**
	b.	Calculate Cosine similarity between U1 and all users. Use weighted average to predict U1's rating for "Pasta." using top-2 similar users. User Pizza Burger Pasta Salad Sushi U1 5 4 ? 2 3 U2 4 5 5 2 4 U3 2 2 1 4 1 U4 5 4 4 3 4 U5 3 3 2 3 2	**10 Marks**	**L3**	**CO4**
		Or			
18.	**a.**	Discuss the data and knowledge sources used in recommender systems.	**10 Marks**	**L2**	**CO4**
	b.	Compute similarity between U1 and others. Predict U1's rating for "Book3" using top-2 similar users. User Book1 Book2 Book3 Book4 Book5 U1 3 4 ? 2 3 U2 4 4 5 3 4 U3 2 3 2 1 2 U4 5 4 5 2 4 U5 1 2 1 1 2	**10 Marks**	**L3**	**CO4**