INDIAN STATISTICAL INSTITUTE
THIRD SEMESTER EXAMINATION, 2020/22 SESSION
PAPER - 13: INFORMATION STORAGE, RETRIEVAL AND DBMS
(MASTER IN LIBRARY INFORMATION SCIENCE)
29th December 2021 (10:00-13:00) (3 Hours)

This Question paper consists of one page. **Attempt Questions and/or Sub-Questions to score maximum marks.** Please print all your answers in the Answer Booklet provided. Scientific Calculator is allowed.

QUESTION 1. Write briefly about

(i) Role of Information Retrieval in Library Information Science **[4 marks]**
(ii) Role of RDBMS in Library Information Science **[4 marks]**
(iii) Information dimension computation via multifractal spectra **[6 marks]**
(iv) Mahalanobis Distance in grouping and clustering **[6 marks]**

QUESTION 2. Explain how to plot the histogram for the data created of your choice within the range of 4 bits/pixel, and threshold that data by choosing the threshold value more than the mean value of the data. **[8 marks]**

QUESTION 3. Write briefly about the Rectangular Granulometries and on how granulometries would help in quantifying the geometric complexity of delimiter space that appears on the first-pages of technical periodicals. **[10 marks]**

QUESTION 4. Explain in detail the K-Mixture Model, with relevant equations and parameters, which is popular in automatically summarizing the documents. **[10 marks]**

QUESTION 5. How to compute spatial autocorrelation via Moran's Index for a spatial field of your choice? Show all steps involved in estimating Moran's I. Write its importance in the context of information retrieval. **[10 marks]**

QUESTION 6. Explain the following three morphology-based interpolations with the support of illustrations and equations. Briefly explain under what situation in the context of information science one employs the following morphological interpolations? **[12 marks]**

a. Skeletonization by Influence Zones (SKIZ), and Weighted SKIZ
b. Binary Morphological Median
c. Grayscale Morphological Median Function

QUESTION 7. Write a simple morphology-based algorithm to compute the ranks for pairing the three spatial fields with similar size configurations such as f^1, f^2, and f^3. **[10 marks]**

END OF PAPER