

Dr. Greetanjali

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T3 EXAMINATION- DEC 2019

B.Tech. VII & M.Tech. I Semester

COURSE CODE: 10M11CI111

MAX. MARKS: 35

COURSE NAME: Advance Data Structures

COURSE CREDITS: 03

MAX. TIME: Two Hour

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. Describe inverted index data structure for text searching from a collection of documents. Compute construction cost and search cost of inverted index. Construct inverted index for the following collection. **[3 MARKS]**
  - Doc1: breakthrough drug for schizophrenia
  - Doc2: new schizophrenia drug
  - Doc3: new approaches for treatment of schizophrenia
  - Doc4: new hopes for schizophrenia patients
2. What are bloom filters? How to determine optimal size of bloom filters. Explain practical application of compact approximates with proper justification? **[1+2+2=5 MARKS]**
3. What is splay tree? Create a splay tree of following items: {13, 10, 9, 12, 8, 5, 11, and 16} **[2 MARKS]**
4. a) What is cuckoo hashing? Explain how insertion process in a cuckoo hashing is successful if associated graph contain one or no cycle? **[2+3=5 MARKS]**
5. a) Explain certain parameters to analyze the performance of skip lists.  
b) Draw the skip list of following items with their mentioned heads: 8 with head 2, 3 with head 1, 20 with head 1, 15 with head 1, 22 with head 2 and 30 with head 2. Write the number of counts after inserting 25 in the skip list.

c) Explain inverted index. Further, describe the creation and compression of inverted index.

[2+2+2=6 Marks]

6. a) What is KD tree. Explain the difference between KD tree and Quad tree in detail.

b) Let  $T$  be a quad tree with  $m$  nodes. Then the balanced version of  $T$  has  $O(m)$  nodes and can be constructed in  $O((d + 1)m)$  time. Justify the answer through an example.

[2+3=5 Marks]

7. Explain the example of stack and binary counter in potential and aggregate analysis.

[2+2=4 Marks]

8. What is locality sensitive hashing? Explain the need of buffer tree in dynamic data structure in detail.

[2+3=5 Marks]

JUIT 13 EXAMINATION DEC 2019