

GUJARAT TECHNOLOGICAL UNIVERSITY**ME – SEMESTER – I (New)– EXAMINATION – WINTER-2019****Subject Code: 3710215****Date: 03-01-2020****Subject Name: Advanced Data Structures****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss Open Addressing in Collision Resolution in Hashing. **07**
 (b) 1. What is Dictionary? How can Dictionary be implemented? **03**
 2. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function $h(k) = k \text{ mod } 10$ and linear probing. What is the resultant hash table? **04**
- Q.2** (a) Explain k-D tree. **07**
 (b) Write algorithm for Searching in Priority Search Tree. **07**
- OR**
- (b) Explain Quad tree. **07**
- Q.3** (a) Discuss algorithm of Search operation in Skip list. Also give one example to explain it. **07**
 (b) Explain Two Dimensional Range Searching. **07**
- OR**
- Q.3** (a) Discuss Insert algorithm for Insert operation in Binary Search Tree. Also give one example to explain it. **07**
 (b) Discuss 4 rotation operations for Insert operation in AVL tree with example. **07**
- Q.4** (a) What is B-Tree? Discuss advantage of using it. Show one example of such tree of order 4. **07**
 (b) Define Red-Black tree. Also discuss solution of various cases of violations that occur while inserting a node in Red-Black tree. **07**
- OR**
- Q.4** (a) Discuss Brute-Force pattern matching algorithm. Count total number of comparison to search Pattern (P) from the Text (T), as given below: **07**
 T : *a b c a b b c a b b a*
 P : *a b b a*
 Show all intermediate comparisons.
- (b) What is the importance of Failure function in KMP (Knuth-Morris-Pratt) algorithm? Show KMP Failure function's value for the following pattern in form of a table. **07**
 P : *a a b c a d a a b e*
- Q.5** (a) Discuss KMP Match algorithm to find string index of the first substring of Text (T) matching Pattern (P). **07**
 (b) Explain Rehashing in Brief with Example. **07**
- OR**
- Q.5** (a) Discuss Standard Tries and Compressed Tries. **07**
 (b) Discuss Huffman coding method. Explain it with an example. **07**
