DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER IV [IT]
SUBJECT: (IT-406) DATA STRUCTURES AND ALGORITHMS

Examination	**: Third Sessional**	**Seat No.**	**: _____**
Date	**: 28/03/2014**	**Day**	**: Friday**
Time	**: 11:00 to 12:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

(b) Create an optimal trie for the data given below sampling from left to right one character at a time from the key values. **[3]**
amiot, avenger, avro, heinkel, helldiver, macchi, marauder, mustang, spitfire,sykhoi

(c) Write a recursive algorithm for quick sort. **[3]**

(d) Create a B-tree of order-3 for the following data: **[3]**
D, I, A, L, J, B, O, F, N, M, K, P, R.

(e) Create a digital search tree by inserting the following elements: **[3]**
1000, 0010, 1001, 1100, 0001, 0011, 0000

Q.2 Attempt *Any Two* from the following questions. **[12]**

(a) Write an algorithm for iterative merge sort and sort the following list showing the status after every pass: **[6]**
26, 5, 77, 1, 61, 11, 59, 15, 48, 19

(b) 1) What is hashing? Explain different hash functions that you know. **[3]**
2) What is collision? Explain collision resolution technique with example. **[3]**

(c) Write an algorithm for Heap sort and sort the following list showing the status after every pass: **[6]**
12, 2, 16, 30, 8, 28, 4, 10, 20, 6, 18

Q.3 (a) Construct an AVL search tree by inserting the following elements in the order of their occurrence: **[6]**
64, 1, 44, 26, 13, 110, 98, 85

(b) Construct a Red-Black tree by inserting the following elements in the order of their occurrence: **[6]**
Apr, Jan, Dec, Sep, Mar, Feb, Nov, Aug, Oct, Jun, May, Jul

OR

Q.3 (a) Construct a 2-3-4 search tree by inserting the following elements in the order of their occurrence: **[6]**
70, 30, 90, 50, 5, 95, 10, 40, 80, 7, 75, 85, 60, 35

(b) Delete the following elements from the above constructed 2-3-4 search tree: **[6]**
40, 80, 5, 60, 90
