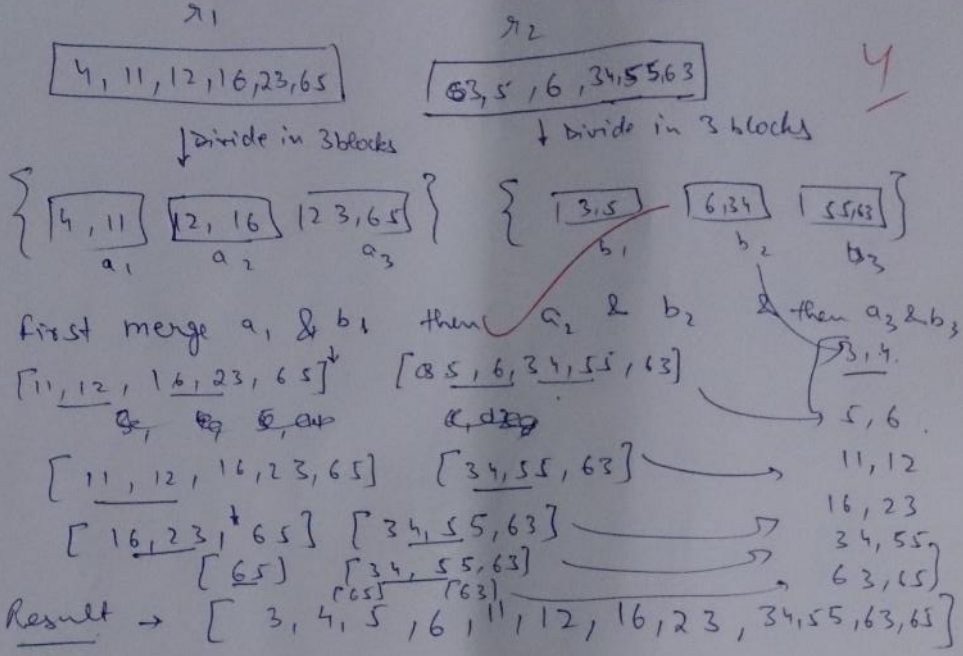
Name: ANSHUL GOYAL
Entry No.: 2012ME20904
Group 02

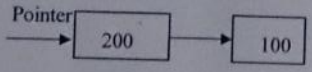
Q5. (8)

a. (4) Assume that you have internal memory of 6 locations of integer type. Sort the list [23, 12, 4, 16, 65, 11, 34, 55, 5, 63, 3, 6] of integers using external sorting technique. Show the steps of each pass.

Divide it into 2 runs & sort them internally.



b. (2+2) Give a of sequence of requests for memory requirement that can be met by BF and not FF and vice versa if you are given following available memory chunks.



BF and not FF

(i) 50

(ii) 200

2

FF and not BF

Not possible

(i) 90

(ii) 110

(iii) 100

2

110, 100 (100) ✓
10
200 1 90, 10
50 → 30
50
200
50 → 30

150. 100
FF 100 - 100
70.
BF 200
90
FF 110 100
BF 200 10
100
10

Q-2 (b) is not checked which is done at back of the page.

Name: ANSHUL GOYAL
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Group: 02

MINOR II : CSL201
(Data Structures)

Max. Time - 1 hr **Max. Marks 40** **Date: 25/March/2014**

NOTE:

i. *Write your name, entry number and group in all the sheets.*
ii. *Answer all questions in the space provided and continue on the back page of the question if required.*
iii. *Answer given elsewhere will be ignored.*
iv. *For rough work use blank page at the end and space in right margin of each sheet.*
v. *No marks for only answers. Show the working if required.*

32

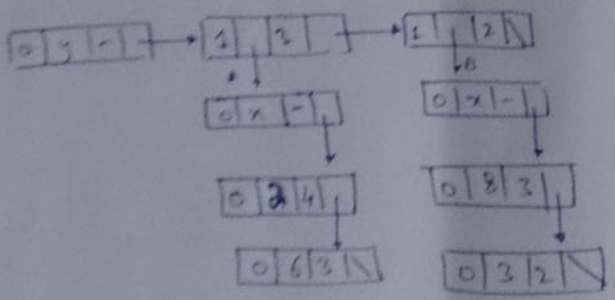
Q1 - 6	Q2 - 7	Q3 - 7	Q4 - 6	Q5 - 6	Q6 - 8	Total - 40
4	1.5	5½	3	6	8	~~28~~

$= (2x^4 - 6x^3)y^3 + (8x^3 + 3x^2)y^2$
$= Ay^3 + By^2$

Q1. (6)

a. (4) Represent the following polynomial $2x^4y^3 + 6x^3y^3 + 8x^3y^2 + 3x^2y^2$ using generalized list structure having node structure as (tag, data/dlink, exp, link). Note that tag=0 if field contains data else 1 if field contains dlink.

4



4/

b. (1+1) If a binary tree T contains 120 nodes.

i. What is the maximum height of T?

7/

0/

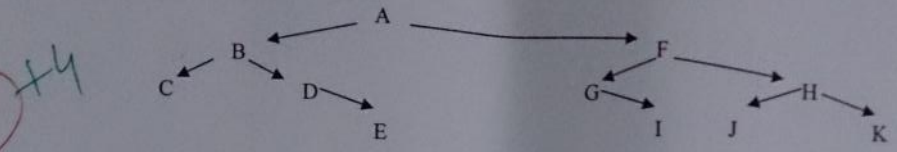
ii. If number of terminal nodes are 50, what is the number of nodes with degree one?

@ 1/4

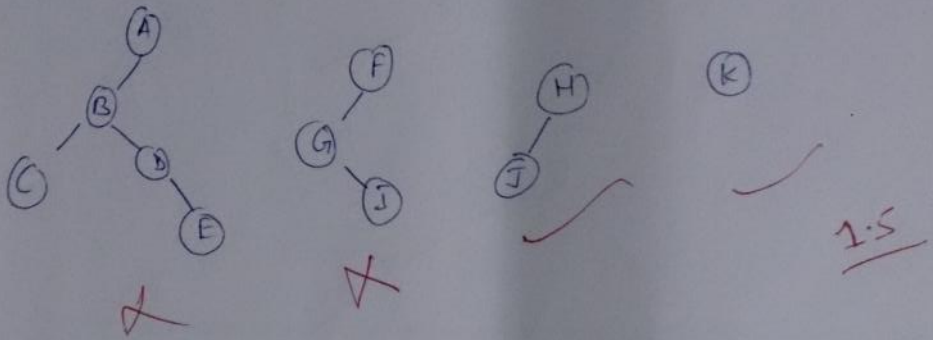
Name: ANSHUL GOYAL
Entry No.: 2012ME20904
Group 02

Q2. (7)

a. (3) Given below is a binary tree corresponding to a forest. What are the trees of this forest?



1.5 +4



4

X

1.5

b. (4) Draw a binary tree corresponding to an arithmetic expression a + (b - c) / (d * e) * f + g so that **preorder, inorder** and **postorder** traversal of this binary tree comes out to be prefix, infix and postfix expression respectively.

a + (b-c)/(d*e) * f + g

= {a + (b-c)/(d*e) * f} + g

= {a + ([(b-c)/(d*e)] * f)} + g

X

0

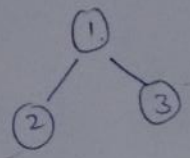
Name: ANSHUL GOYAL
Entry No.: 2012ME20904
Group 02

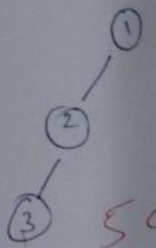
Q3. (7)

a. (3) Draw all possible binary trees whose preorder traversal sequence is 1, 2, 3?

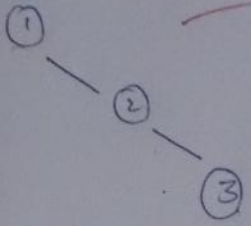
(V L R)

Pre order 1, 2, 3





5 cases



5 1/2

1 1/2

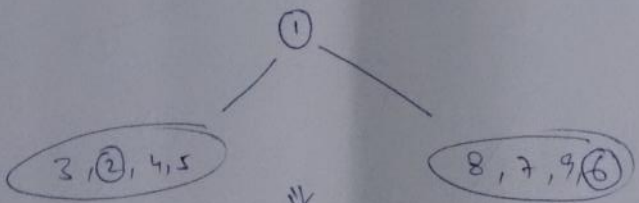
b. (4) You are given postorder and inorder traversal sequences of a binary tree as **postorder: 3, 5, 4, 2, 8, 9, 7, 6, 1 & inorder: 3, 2, 4, 5, 1, 8, 7, 9, 6**. Construct a binary tree from above sequences.

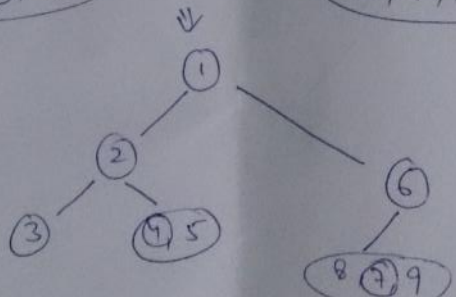
Postorder : 3, 5, 4, 2, 8, 9, 7, 6, (1) Root — L R V

Inorder : (3, 2, 4, 5,) 1, (8, 7, 9, 6) — L V R

Left Right

4



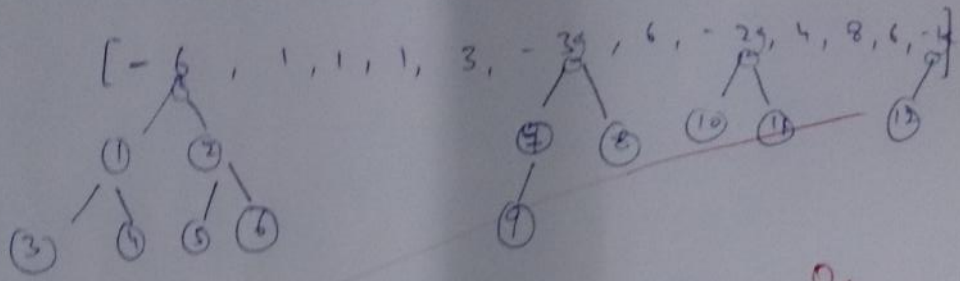


Name: ANSHUL GOYAL
Entry No.: 2017ME20904
Group OD

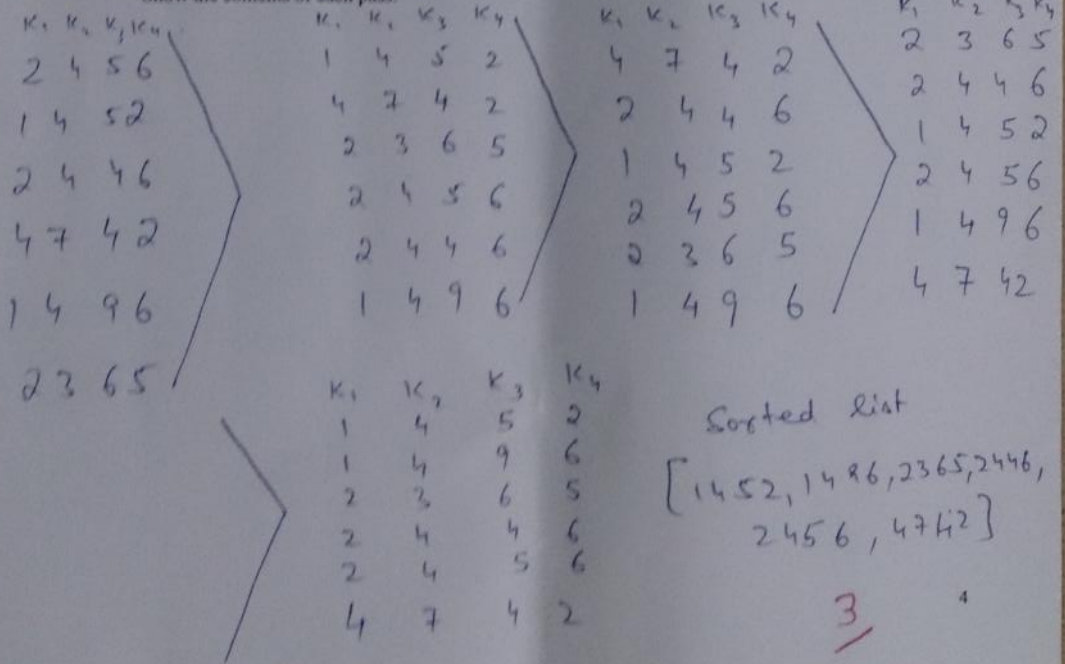
Q4. (6)

a. (3) You are given a parent array [-6,1,1,1,3,-3,6,-2,4,8,6,-1] of elements in a set S = {1,2,3,4,5,6,7,8,9,10,11,12}. Draw the corresponding trees of the disjoint sub- sets generated from S. Note that root of tree has parent link containing "-" number of elements in the tree.

(3)



b. (3) Sort the list [2456, 1452, 2446, 4742, 1496, 2365] using radix sort method as discussed in the class. Show the contents of each pass.



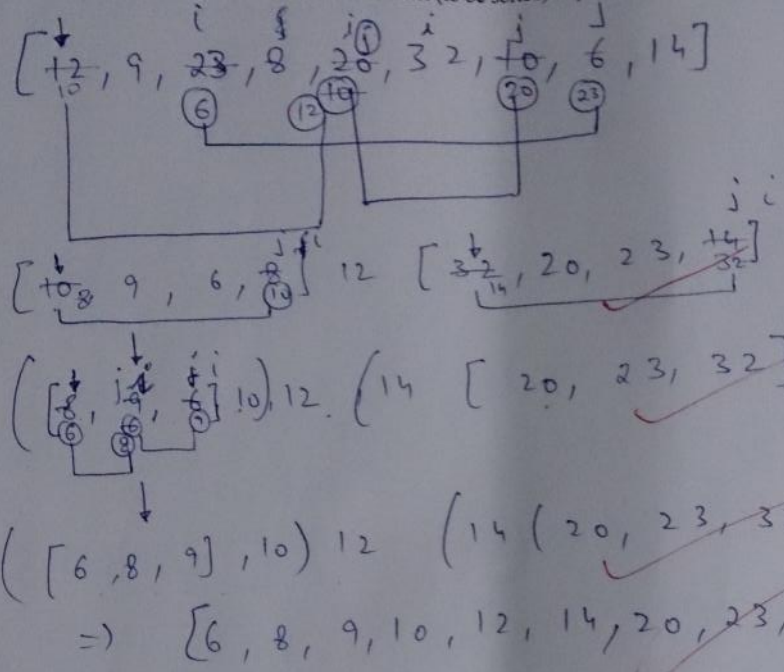
3

4

Name: ANSHUL GOYAL
Entry No.: 2012ME20904
Group 02

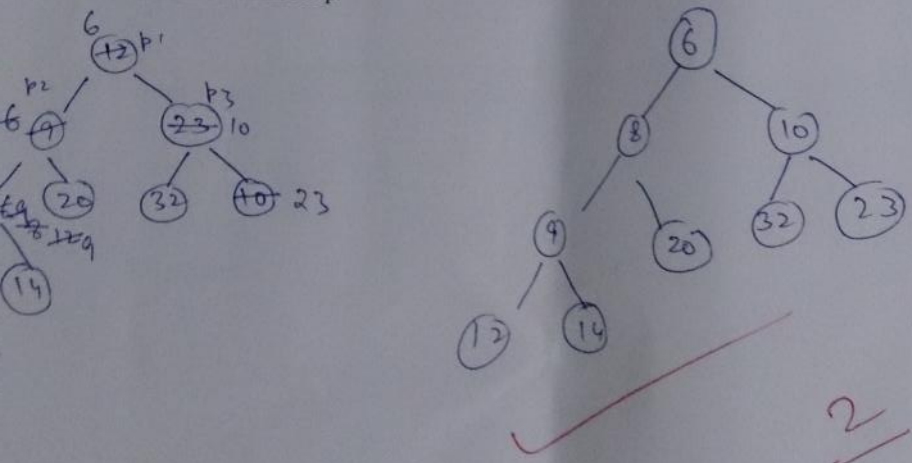
Q5. (4+2) You are given a list [12, 9, 23, 8, 20, 32, 10, 6, 14] of integer values. Sort it in ascending order using following techniques. Show all the steps.

a. Quick Sort: Choose first element of a list (to be sorted) as pivot point.



4

b. Create initial Min Heap.



2