

Assignment No. 2

Q1) Use replacement selection to produce sorted runs from the following file. Assume $P=3$

33 18 24 58 14 17 21 67 12 547 16 ← front string

Solⁿ:-

Remaining input	Memory	Output run (A)
33, 18, 24, 58, 14, 17, 21, 67, 12	5, 47, 16	-
33, 18, 24, 58, 14, 17, 21, 67	12, 47, 16	5
33, 18, 24, 58, 14, 17, 21	67, 47, 16	12, 5
33, 18, 24, 58, 14, 17, 7	67, 47, 21	16, 12, 5
33, 18, 24, 58, 14, 17	67, 47, (7)	21, 16, 2, 5
33, 18, 24, 58, 14, 7	67, (17), (7)	47, 21, 16, 2, 5
33, 18, 24, 58	(14), (17), (7)	67, 47, 21, 16, 2, 5




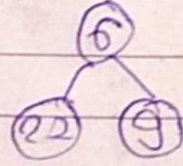
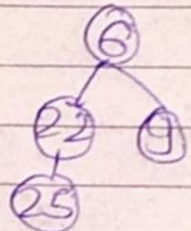
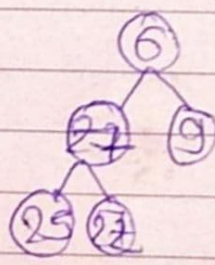
Remaining First Run complete; Start building Second

Remaining input	Memory	Output Run (B)
33, 18, 24, 58	14, 17, 7	-
33, 18, 24	14, 17, 58	7
33, 18,	24, 17, 58	14, 7
33	24, 18, 58	17, 14, 7
-	24, 33, 58	18, 17, 14, 7
-	- 33, 58	24, 18, 17, 14, 7
-	- - 58	33, 24, 18, 17, 14, 7
-	- - -	58, 33, 24, 18, 17, 14, 7

Q2 showing all the steps construct the following list of unsorted keys using heap building & heap sorting

9 22 6 25 7 2 10 14 3 15

Soln:-

New key to be inserted	Heap after insertion of new key	selected heaps in the tree
9	9	
22	9 22	 
6	6 9 22	
25	6 9 22 25	
7	6 9 7 2 25	

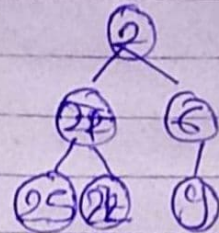
New key to be inserted

Heap after insertion of new key

Selected heaps in the tree

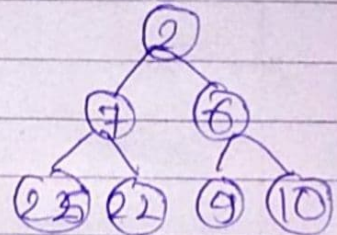
2

2 7 6 22 9



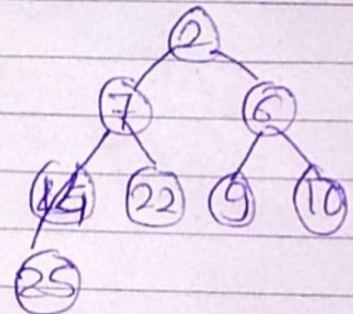
10

2 7 6 25 22 9 10



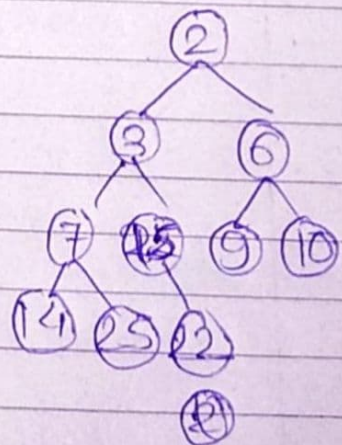
14

2 7 6 14 22 9 10 25



8

2 3 6 7 22 14 25 19 22





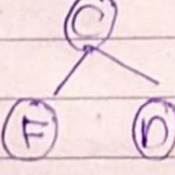
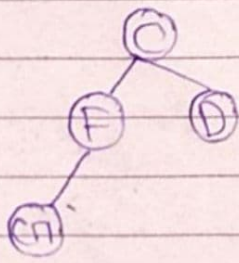
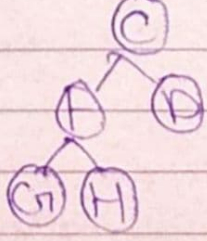
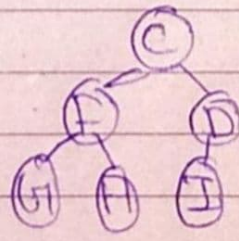
15

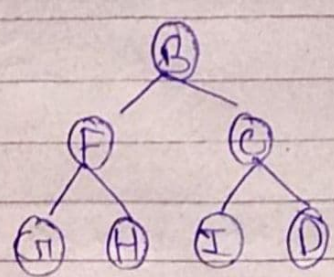
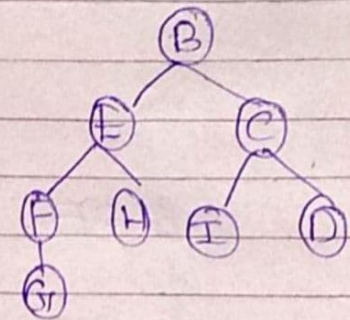
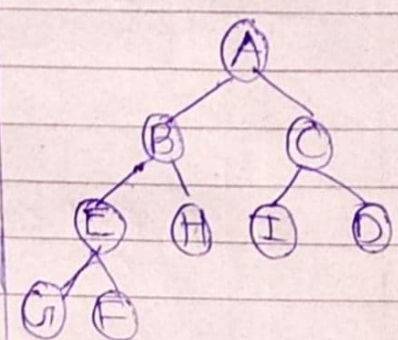
2 3 6 7 15 9 10 14 25 22

Q3. Showing all the steps construct the heap from following list of unsorted keys using heap building and heap sorting

F D C G H I B E A

Solⁿ:-

New key to be inserted	Heap after insertion of the new key	Selected heap in form of tree
F	F	
D	F D	
C	C F D	
G	C F D G	
H	C F D G H	
I	C F D G H I	

New key to be inserted	Heap after insertion of the new key	Selected Heap in the tree
B	B F C G H I D	 <pre> graph TD B((B)) --- F((F)) B --- C((C)) F --- G((G)) F --- H((H)) C --- I((I)) C --- D((D)) </pre>
E	B E C F H I D G	 <pre> graph TD B((B)) --- E((E)) B --- C((C)) E --- F((F)) E --- H((H)) F --- G((G)) C --- I((I)) C --- D((D)) </pre>
A	A B C E H I D G F	 <pre> graph TD A((A)) --- B((B)) A --- C((C)) B --- E((E)) B --- H((H)) E --- G((G)) E --- F((F)) C --- I((I)) C --- D((D)) </pre>

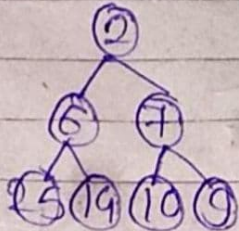
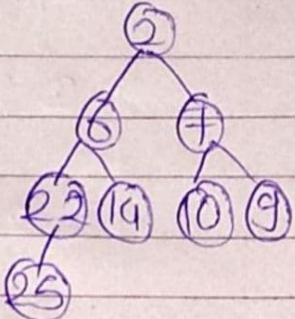
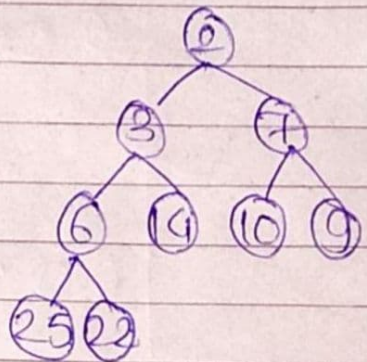
Q4

showing all the steps construct the heap following list of unsorted keys using heap building and heap sorting

6 25 7 2 14 10 9 22 3 15

Ans:-

New keys to be inserted	Heap after insertion of the new key	Selected heaps in the tree
6	6	(6)
25	6 25	(6)
7	6 25 7	(25) (6) (25 7)
2	2 6 7 25	(2) (6 7) (25)
14	2 6 7 25 14	(2) (6 7) (25 14)
10	2 6 7 14 25 10	(2) (6 7) (25 14 10)

New keys to be inserted	Heap after insertion of the new key	Heapified tree in the tree
9	2, 6, 7, 25, 14, 10, 9	
22	2, 6, 7, 22, 14, 10, 9, 25	
8	2, 8, 7, 6, 14, 10, 9, 25, 22	
15	2, 6, 7, 16, 14, 10, 9, 25, 22, 15	