

Internals -03

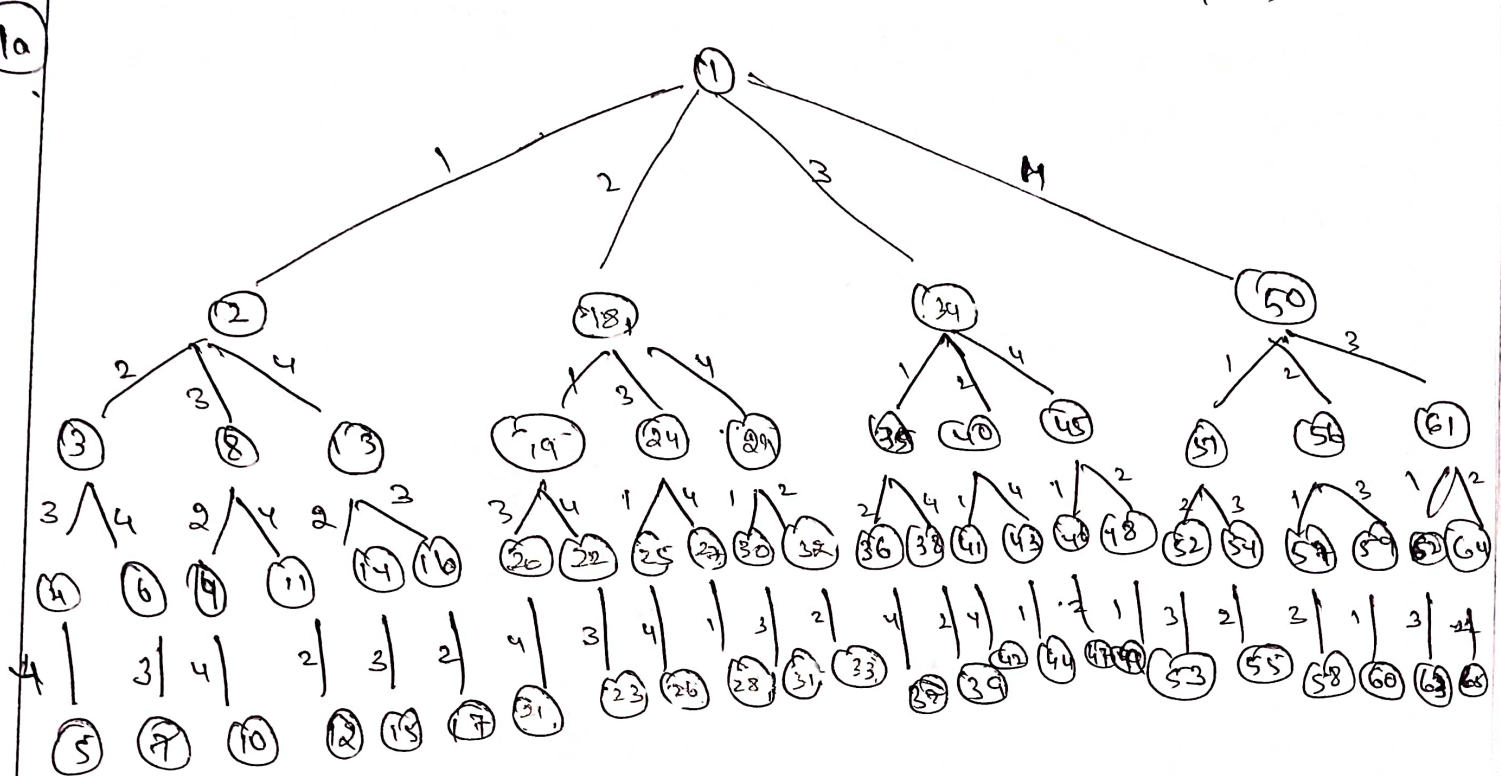
DAA (18CS42)

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CSE A'sec

4th Sem



1b Initially subset = {}

Sum = 0

5	5
5, 10	15 $\because 15 < 30$
5, 10, 12	27 $\because 27 < 30$
5, 10, 12, 13	40
5, 10, 12, 15	42
5, 10, 12, 18	45
5, 10	
5, 10, 13	28
5, 10, 13, 15	33

Then add next element

Add next element

Add next element

Sum ~~exceeds~~ $d = 30$

Sum exceeds $d = 30$

Sum exceeds $d = 30$

Not possible, backtracking

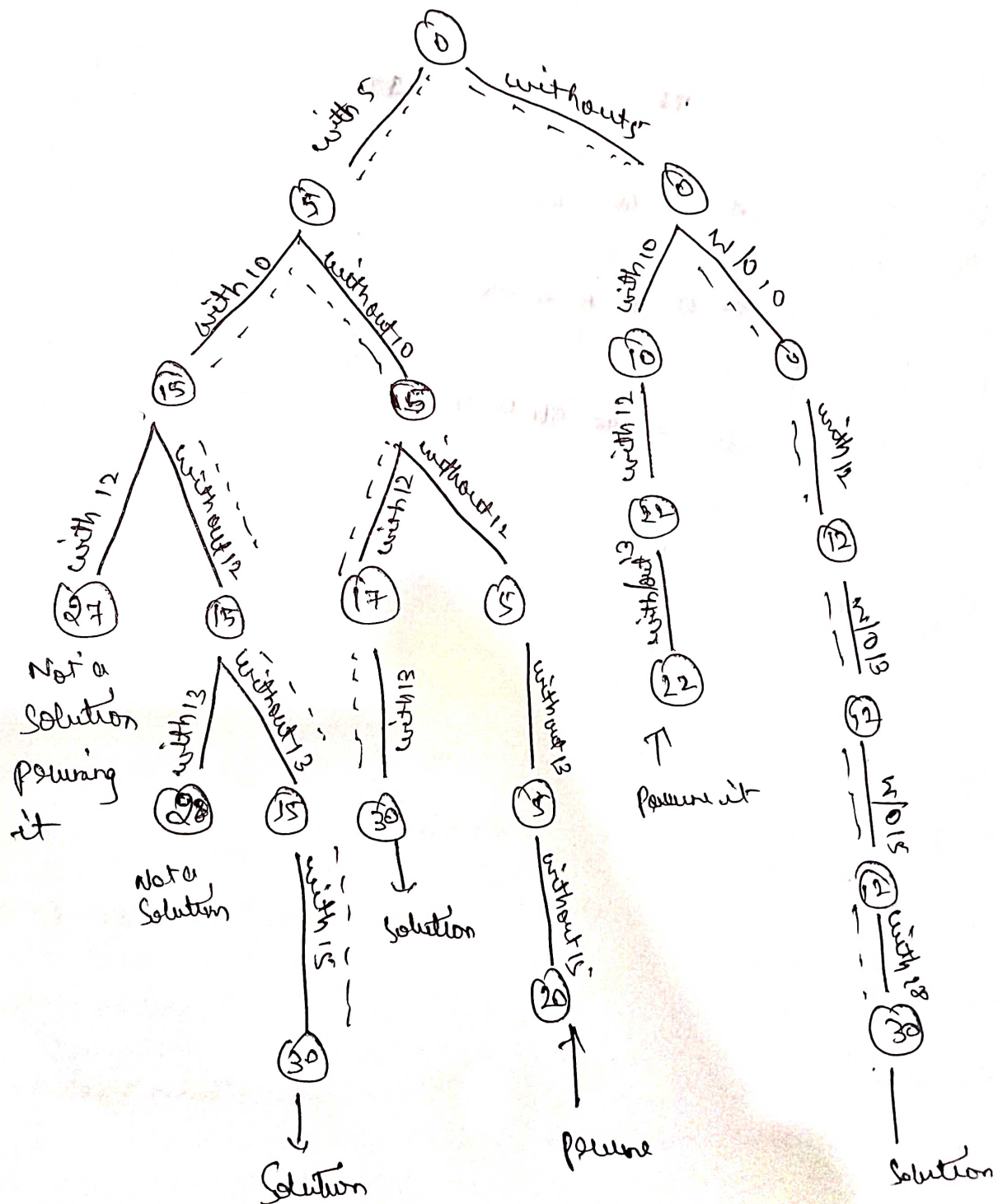
8, 10

5, 10, 15

30

Solution obtained as
Sum = 30 = d

The state space tree can be as follows,
(5, 10, 12, 13, 15, 17)



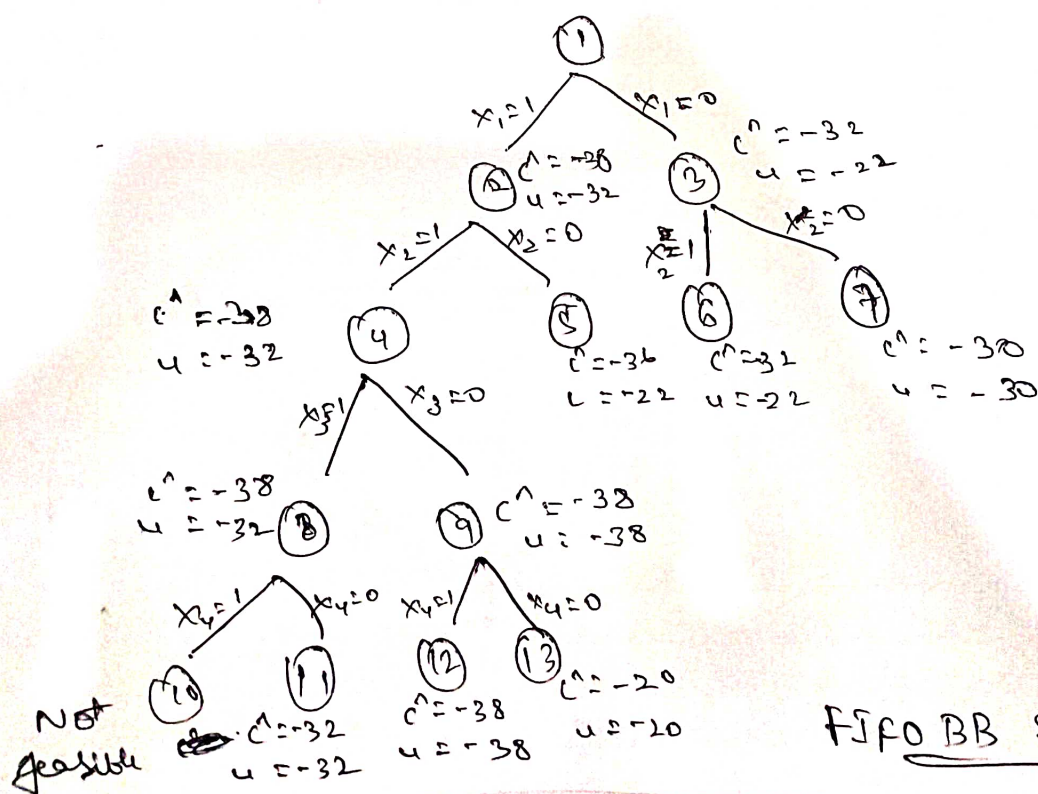
10a) The LC Branch and bound Solution can be obtained using fixed ~~by~~ triple size formulation.

Steps:

1. Draw Space tree
 2. Compute $c^*(.)$ and $u(.)$ for each node.
 3. if $c^*(x) > \text{upper}$ kill node x .
 4. otherwise the minimum cost $c^*(x)$ becomes E-node.
 5. Repeat Step 3 and 4 until all the nodes get covered.
 6. The minimum cost $c^*(x)$ becomes the answer node.
- Trace the path in back word direction from x to root for solution subset.

FIFO and Bound Solution:

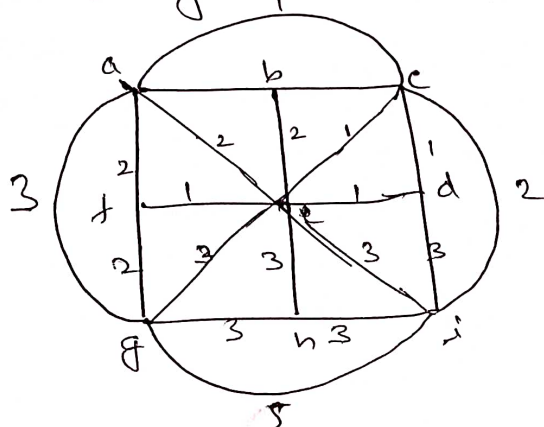
The space tree with variable triple size formulation can be drawn and $c^*(.)$ and $u(.)$ is computed.



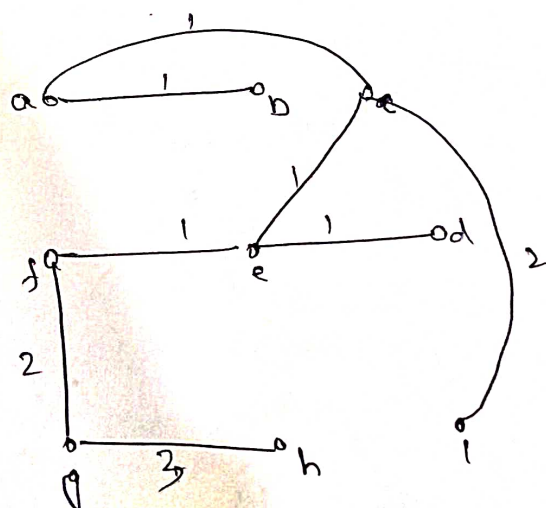
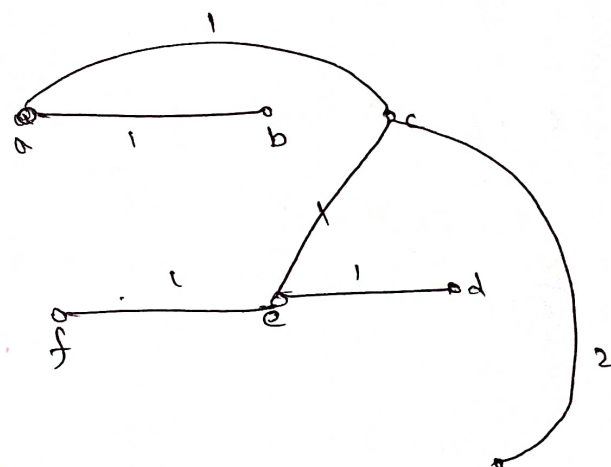
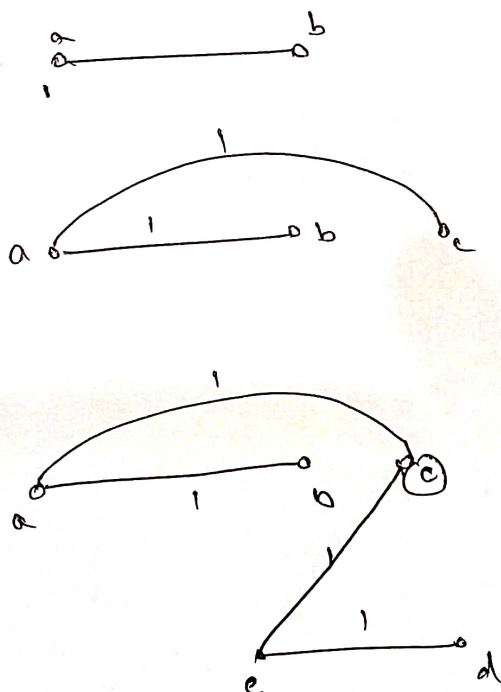
4b

P:- Problems that can be solved in polynomial time.
Polynomial time is nothing but the time expressed in terms of polynomial.

Eg 1:- Find the min. spanning tree for the following using Kruskal's algorithm.



Soln:-



NP It stands for "non-deterministic polynomial time".

Ex 1 Travelling Salesman problem.

The tour path a b d c a and total cost of tour will be 16.

If you get the solution by applying certain algorithm then travelling Salesman problem is NP-complete problem.
If we get no solution at all by applying an algorithm then the travelling salesman belongs to NP hard class.

