Jadavpur University Ex/IT/T/321/2017

B.E. Information Technology

Design & Analysis of Algorithm (IT/T/321)

3rd Year 2nd Semester exam 2017

TIME 3 hr (any five) total marks 100

Q1)a) Write the short note on Big O Notation and Big omega (Ω) Notation.

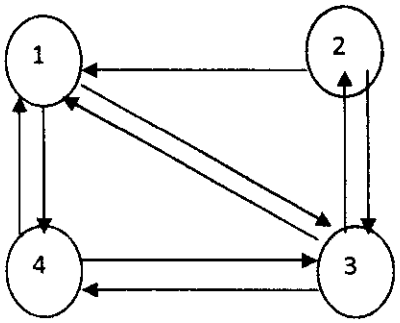
b) Write the algorithm for Tower of Hanoi problem with Time Complexity.

C) Write the algorithm for Merge Sort problem with Time Complexity

3*2+7+7=20

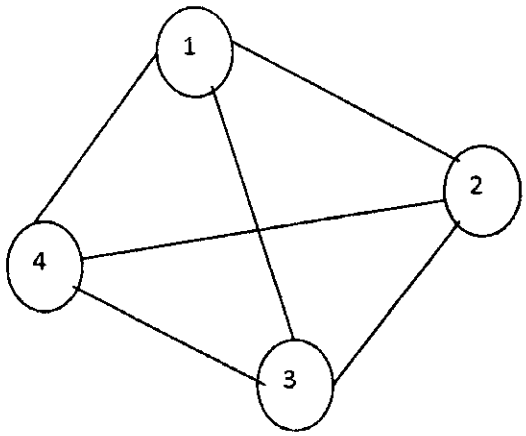
Q2) a)Write the algorithm for all pair shortest path problem with Time Complexity.

c) And find the all pair shortest path of the following graph. 8+12=20



d	1	2	3	4
1	0	α	4	3
2	2	0	3	α
3	3	1	0	3
4	1	α	2	0

Q3)a) Find the minimum cost path starting from 1 of a traveling sales man problem of the following graph.



d	1	2	3	4
1	0	10	12	15
2	10	0	20	26
3	12	20	0	30
4	15	26	30	0

b) Write the algorithm for n-queen problem. 12+8=20

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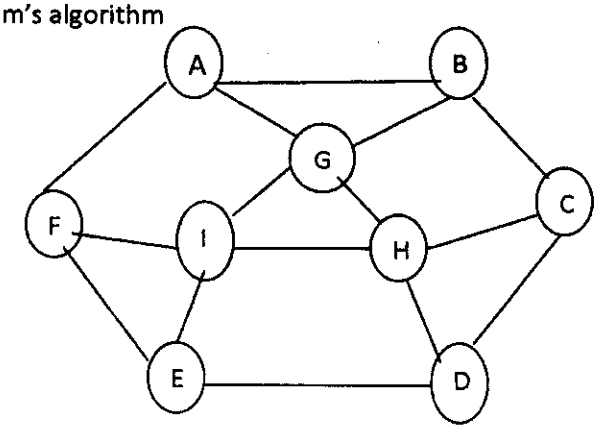
Q4) Write the prim's algorithm with Time Complexity. Find a minimum cost spanning tree with the help of prim's algorithm



AB->4, BC->6,CD->4,DE->3,EF->8,FA->9,

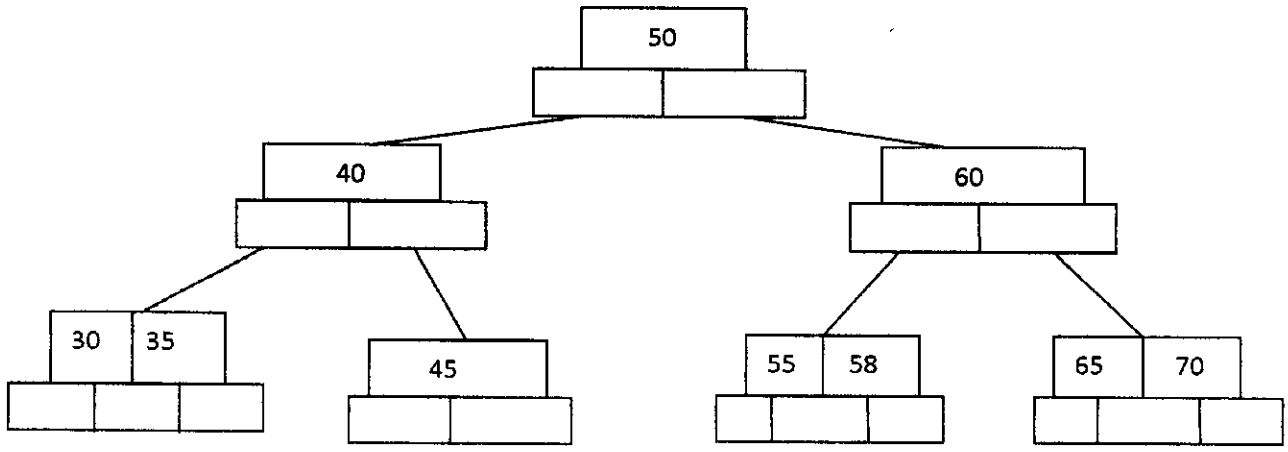
AG->5,BG->8,GH->5,GI->3,HI->6,IF->7,CH->4,

EI->4,DH->10

8+12=20

Q5) a) solve the knapsack problem with the following conditions:
Consider, a given knapsack has the following instance,
Weight of the knapsack (M) = 15. Total number of elements (n) = 7.
Weight -> (z1,z2,z3,z4,z5,z6,z7)= (2,3,5,7,1,4,1)
Profits -> (a1,a2,a3,a4,a5,a6,a7) = (10,5,15,7,6,18,3)
b) Write the algorithm of knapsack problem with Time Complexity. 12+8=20

Q6) Write the definition of B-tree, and write all the operation in a B tree . 3+3*3=12



Perform the following operation in the order of their appearance (on the B- tree of order 3) :

a) Insert 75, 57 b) delete 35,65 8

Q7) Write the short note on Greedy method. What do you mean by feasible region, objective function and feasible solution? Write the algorithm of Depth First Search with Time Complexity.

2+6+12=20