KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COMP 311

COURSE TITLE: DESIGN AND ANALYSIS OF ALGORITHMS

STREAM: Y3S1

DAY: TUESDAY

TIME: 9.00 – 11.00 A.M.

DATE: 07/12/2010

INSTRUCTIONS:

- Attempt **Question ONE** and **Any other TWO**

PLEASE TURNOVER

QUESTION ONE 30 MARKS

a) Write algorithm to find the maximum and the minimum values in the given list **[4marks]**

b) Using Greedy method find the optimum solution for knapsack instances N=7,M =15

P1,P2, P3…….P7 (10,5,15,7,6,18,3)

W1,W2,W3…….W7 (2,3,5,7,1,4,1)

show your workings **[6 marks]**

c) Given the following array determine wether x is present and if is present determine the position of x where x= 143 (*show your workings)*

a[1]	a[2]	a[3]	a[4]	a[5]	a[6]	a[7]	a[8]	a[9]	a[10]	a[11]	a[12]	a[13]	a[14]
-15,	-6,	0,	7,	9,	23,	54,	82,	101,	112,	125,	131,	142,	151

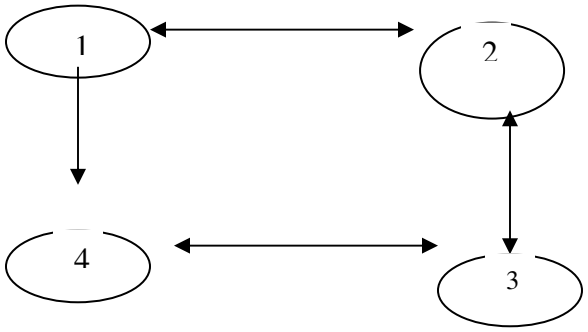
[5 marks]

d) How do we analyze the performance of an algorithm **[4 marks]**

e) Develop branch and bound technique for traveling sales man problem **[5 marks]**

f) Solve the following traveling sales man problem using Dynamic programming (*show your workings)*

[6 marks]



	1	2	3	4
1	0	10	15	20
2	5	0	9	10
3	6	13	0	12
4	8	8	9	0

QUESTION TWO 20 MARKS

a) Write and explain algorithm for 8 queen back tracking problem [5 marks]

b) Describe Dynamic programming technique [4 marks]

c) Describes two file organization techniques [4 marks]

d) Describe the divide and conquer algorithm [4 marks]

e)) Schedule the Two jobs that have to be scheduled on Two processor.

The matrix is T=(2 1)

(3 3)

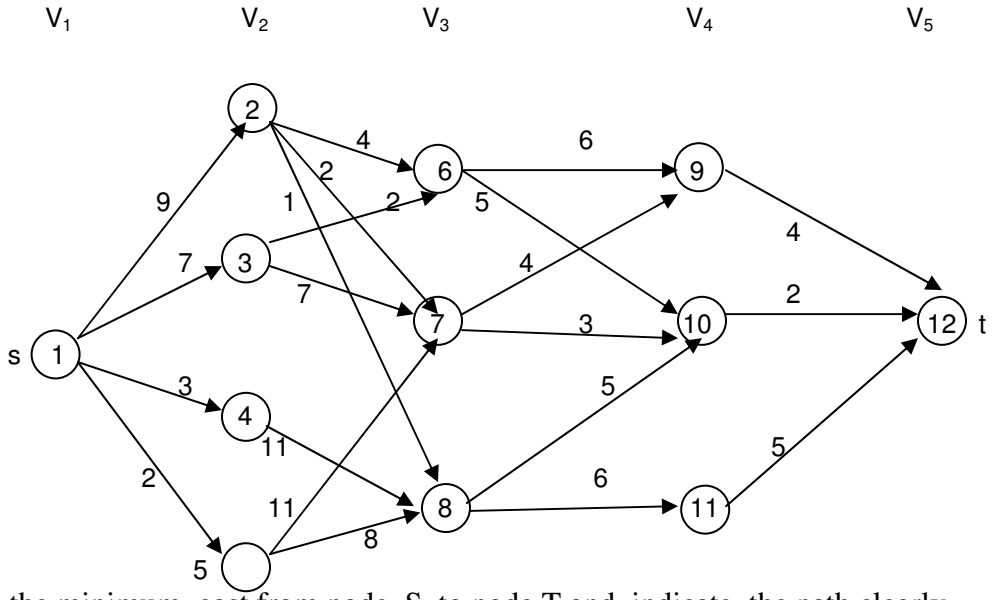
[3 marks]

QUESTION THREE 20 MARKS

a) Find the optimal placement for 13 programs on three tape where the programs are of lengths 12,5,8,32,7,5,18,26,4,3,11,10 and 6. **[5 marks]**

b) Write DIJKSTRA's algorithm **[5 marks]**

c) Consider the five-stage graph given below.



find the minimum cost from node S to node T and indicate the path clearly **[4 marks]**

d) Describe 0/1 knapsack problem using Dynamic programming **[4 marks]**

e) Describe index file organization **[2marks]**

QUESTION FOUR 20 MARKS

a) Describe merge sort as used in divide and conquer technique **[5 marks]**

b) Describes two sorting techniques **[6 marks]**

c) Solve the 0/1 Knapsack problem using dynamic programming when
n = 5, m = 12 P = (10,15,6,8,4) W = (4,6,3,4,2) **[4 marks]**

d) Describe binary search algorithm as used in searching and traversal **[5 marks]**