



The Open University of Sri Lanka
B.Sc Degree Programme
CSU 2279 : Data Structures and Algorithms
Closed Book Test 2007/2008
Duration : One and Half Hours
Date : 3rd April 2008

Time : 4.00 pm – 5.30 pm

Answer All Questions.

Q1) a) i) State all the steps when the following string is sorted into the alphabetical order using the *bubble sort* algorithm.

C A M P U S

ii) Write down the *linear insertion sort* algorithm to sort a given data set into descending order. You may assume that the data set is stored in an array named X .

iii) Compare and contrast the *straight selection sort* algorithm with the *quick sort* algorithm.

b) i) What are the dominant factors of internal sorting methods and external sorting methods ?

ii) State a simple searching method to search a list of unordered records. Write the algorithm clearly.

Q2) a) i) Represent the following arithmetic expression in a binary tree.

$(A+B*C) \$ ((A+B)*C)$
\$ is the exponentiation.

ii) Give the infix, prefix and postfix forms of the above expression.

b) Write a pascal procedure to print the Flight Number and the Number of available seats of the flight in the following format. If you have made any assumptions, state them clearly.

FLIGHT NO:	NO: OF SEATS
UL 1234	34
UL 5678	75



Q3) a) i) State the Rule for sums and the Rule for products. Proof is not necessary.

ii) What aspects you should consider when you design an algorithm?

b) Calculate the running time of following procedures/functions.

i) Function findpivot (i,j : integer): integer;

Begin

Firstkey := A[i];

For k := i+1 to j do

If A[k] > firstkey

Then return (k)

Else if A[k] < firstkey

Then return (i);

Else

Return (0)

End.

ii) Procedure bubble;

Var

i,j,temp ; integer;

begin

for i:= 1 to n-1 do

for j := n down to i+1 do

if A[j-1] > A[j] then

begin

temp := A[j-1];

A[j-1] := A[j];

A[j] := temp;

end

end;

c) What do you mean by the term "Algorithm"?

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