

Session : Midterm exam (2022)
Module : Algorithms and Data Structures
Duration : 1 : 30 h
Responsible : Yahya Albalawi



Note: Documents aren't allowed. The questions are independent. All responses have to be written down on the same sheet.

Information

Name:

Questions 1 (10 pts): choose the right answer(s)

1. An algorithm is.....followed to problem

- a. Way
- b. Program
- c. Process
- d. Steps
- a. build
- b. treat
- c. solve
- d. create

2. A problem can have

- a. Many algorithm
- b. Only one algorithm
- c. No algorithm
- d. Many problem

3. An algorithm process must be

- a. Correct
- b. infinite
- c. wrong
- d. complicated

4. Data structure a particular way of

- a. Reading data
- b. Treating data
- c. Presenting data
- d. Organizing data

5. The choice of data structure affects

- a. The efficiency of a program
- b. The powerfulness of a program
- c. The efficiency and the powerfulness of a program
- d. The correctness of an algorithm

6. The worst-case running time is:

- a. measures the maximum number of primitive operations executed
- b. measures the minimum number of primitive operations executed
- c. measures the average number of primitive operations executed
- d. none of above

7. The pseudo-code is:

- a. a detailed yet readable description of what a computer program or algorithm must do, expressed in a formal programming language
- b. a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally styled natural language
- c. a detailed yet readable description of what a computer program or algorithm must do, expressed in any natural language that can be understood by the author of the algorithm
- d. Mathematical concepts

8. With single linked list, each node contains at least:

- a. a piece of data
- b. a pointer to the next node
- c. a piece of data and pointer to the next node
- d. a piece of data pointer to the next and the previous node

9. An example for linear function is

- a. Finding a max value in an array
- b. sorting an array in ascending/descending order using Bubble Sort
- c. Finding a min value in an array
- d. A + c

Questions 2 (4 pts): What is the complexity of this code?

Please convert the following problems from infix to postfix

- 1- $A * B + C / D$
- 2- $A + B / C * D$

$A * B + C / D$

$A + B / C * D$

Questions 3(4 pts): fill in the table

Advantages of stack	Disadvantages of array
.....
.....
.....

Questions 4 (4 pts):

<pre> int FindMinElement(int[] array) { int min = array[0]; for (int i=0; i<int n; i++) { if (array[i] < min) { min = array[i]; } } return min; } </pre>	<p>1- What are the inputs and the outputs of this code?</p> <p>Inputs:</p> <p>.....</p> <p>.....</p> <p>Outputs:</p> <p>.....</p> <p>.....</p> <p>2- Explain this code step by step if array =</p> <table border="1"> <tr> <td>15</td> <td>14</td> <td>25</td> <td>21</td> <td>200</td> <td>2</td> <td>3</td> <td>8</td> </tr> </table> <p>.....</p> <p>.....</p>	15	14	25	21	200	2	3	8
15	14	25	21	200	2	3	8		

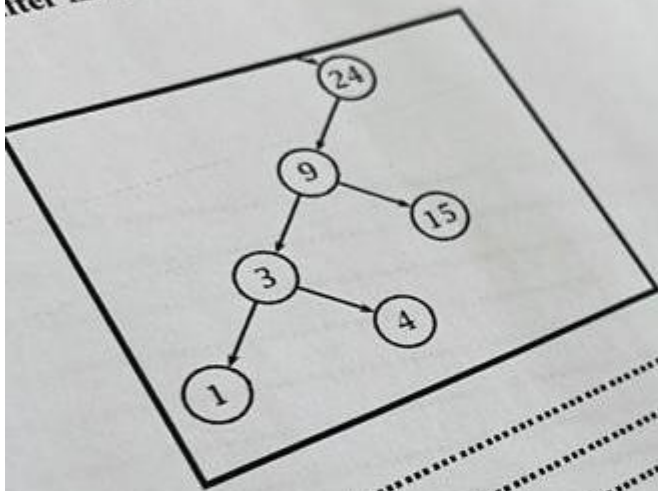


Questions 5 (3 pts):

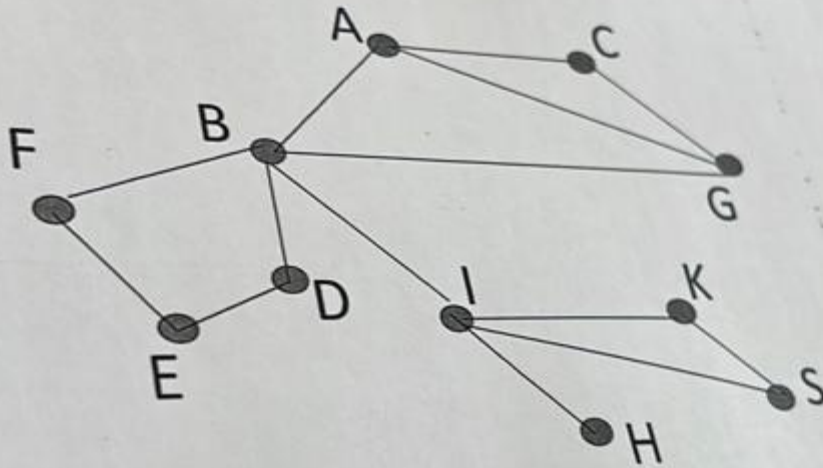
Please write Pseudo-code to find a maximum number from a list of values?

Good luck

the following binary search tree, please re-draw the binary search
after inserting the following 2, 7, 17, 56, 28, 73



4- Given the following graphs, please draw the traversal for this graph using breadth first search, starting from node A?



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