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| Completed on | Saturday, 1 April 2023, 1:22 AM |
| Time taken | 16 mins 45 secs |
| Marks | 6.00/8.00 |
| Grade | 7.50 out of 10.00 (75%) |

Question 1

Correct

Mark 1.00 out of 1.00

The data structure required to check whether an expression contains balanced parenthesis is?

- ☐ a. Tree
- ☒ b. Stack ✓

The stack is a simple data structure in which elements are added and removed based on the LIFO principle. Open parenthesis is pushed into the stack and a closed parenthesis pops out elements till the top element of the stack is its corresponding open parenthesis. If the stack is empty, parenthesis is balanced otherwise it is unbalanced.
- ☐ c. Queue
- ☐ d. Array

The correct answer is: Stack

Question 2

Correct

Mark 1.00 out of 1.00

Select the **correct** statement(s) about linked lists.

Select one or more:

- ☒ a. Linked list can be used to store a sparse matrix in a memory efficient manner ✓
- ☒ b. Implementation should handle dynamic memory allocation/deallocation when inserting/deleting nodes ✓
- ☐ c. Size is needed as a parameter when creating a linked list
- ☐ d. Nodes in a linked list should be contiguous in the memory

Your answer is correct.

The correct answers are:

Implementation should handle dynamic memory allocation/deallocation when inserting/deleting nodes,

Linked list can be used to store a sparse matrix in a memory efficient manner

Question 3

Correct

Mark 1.00 out of 1.00

Which of the following is not an advantage of abstract data types(AST)

- ☐ a. Data abstraction
- ☐ b. Information hiding
- ☒ c. Implementation dependence ✓
- ☐ d. Modularity
- ☐ e. None of the above

The correct answer is: Implementation dependence

Question 4

Incorrect

Mark 0.00 out of 1.00

Choose the correct statement about an array

- ☐ a. Arrays cannot grow dynamically
- ☐ b. Number of elements in an array can be increased
- ☒ c. You need to always declare the number of elements in an array ✗
- ☐ d. Array is not a data structure

The correct answer is: Number of elements in an array can be increased

Question 5

Correct

Mark 1.00 out of 1.00

Which of the following statements are correct regarding arrays and list

- ☒ a. In a List, elements are spread about in memory, but linked together. ✓
- ☒ b. One advantage of the array compared to list is the ability to perform random access without additional data structures. ✓
- ☒ c. Arrays are continuous in memory, which makes it hard (in a performance sense) to insert elements in the middle of the array. ✓
- ☐ d. Insertion is easier in the array compared to list.

The correct answers are: Arrays are continuous in memory, which makes it hard (in a performance sense) to insert elements in the middle of the array., One advantage of the array compared to list is the ability to perform random access without additional data structures., In a List, elements are spread about in memory, but linked together.

Question 6

Incorrect

Mark 0.00 out of 1.00

What does 'stack overflow' mean by :

- ☐ a. Deleting an item from an empty stack
- ☐ b. Accessing an undefined item from stack
- ☒ c. Inserting a large amount of data that is larger than the available memory ✗
- ☐ d. Inserting new items to a full stack

The correct answer is: Inserting new items to a full stack

Question 7

Correct

Mark 1.00 out of 1.00

What is the output of the following code segment on python dictionary:

```
a = {(1,2):1,(2,3):2}
```

```
Print(a[1,2])
```

Answer: 1 ✓

The correct answer is: 1

Question 8

Correct

Mark 1.00 out of 1.00

Consider the following postfix notations and find out the answer using stack operations:

8, 14, 6, +, *, 8, 40, 20, /, +, * is?

$$(14+6)*8*(40/20+8)$$

- ☐ a. 160
- ☒ b. 1600 ✓
- ☐ c. 16000
- ☐ d. 16

The correct answer is: 1600