

AMCAT Questions on Arrays, Linked Lists, Trees, Graphs

Question 1

He again gets a book with x number of non-leaf nodes. How many total number of nodes will be there for him color

- A. $2x$
- B. $x + 1$
- C. $\log x$
- D. $2x + 1$

Answer: Option D

Question 2

What does the following declaration mean?

```
int (*ptr)[10];
```

- A. ptr is array of pointers to 10 integers
- B. ptr is a pointer to an array of 10 integers
- C. ptr is an array of 10 integers
- D. ptr is an pointer to array

Answer: Option B

Question 3

In C, if you pass an array as an argument to a function, what actually gets passed?

- A. Value of elements in array
- B. First element of the array
- C. Base address of the array
- D. Address of the last element of array

Answer: Option C

Explanation: The statement 'C' is correct. When we pass an array as a function argument, the base address of the array will be passed.

Question 4

What is Dynamic Allocation in Array?

- A. Allocation that takes place at compile time
- B. Allocation that take place as bipartite graph
- C. Memory allocation that takes place during run time rendering the resizing of an Array
- D. All of these

Answer: Option C

Question 5

Raman is 7 years old and he wants to color a book. The book happens to be about DSA and contains a Complete binary tree with 7 levels, he wants to use different color for every tree nodes. How many colors will he need?

- A. 28

- B. 31
- C. 63
- D. 127

Answer: Option D

Explanation: To find the total no of nodes in nth level by 2^{n-1} 1 level 1 nodes, 2 level 3 nodes, 3 level 7 nodes, 4 level 15 nodes, 5 level 31 thus 7 has 127 nodes

Question 6

Which type of traversal of binary search tree outputs the value in sorted order?

- A. Post-order
- B. Pre-order
- C. In-order
- D. None

Answer: Option C

Explanation:

In order gives in correct order

Question 7

What is the time complexity of inserting at the end in dynamic arrays?

- A. $O(1)$
- B. $O(n)$
- C. $O(\log n)$
- D. Either $O(1)$ or $O(n)$

Answer: Option D

Explanation: Depending on whether the array is full or not, the complexity in dynamic array varies. If you try to insert into an array which is not full, then the element is simply stored at the end, this takes $O(1)$ time. If you try to insert into an array which is full, first you will have to allocate an array with double the size of the current array and then copy all the elements into it and finally insert the new element, this takes $O(n)$ time.

Question 8

Which of the following is not a disadvantage to the usage of array?

- A. Fixed size
- B. You know the size of the array prior to allocation
- C. Insertion based on position
- D. Accessing elements at specified positions

Answer: Option D

Explanation: Array elements can be accessed in two steps. First, multiply the size of the data type with the specified position, second, add this value to the base address. Both of these operations can be done in constant time, hence accessing elements at a given index/position is faster.

Question 9

The height of a BST is given as h. Consider the height of the tree as the no. of edges in the longest path

from root to the leaf. The maximum no. of nodes possible in the tree is?

A. $2^{h-1} - 1$

B. $2^{h+1} - 1$

C. $2^h + 1$

D. $2^{h-1} + 1$

Answer: Option B

Question 10

The run time for traversing all the nodes of a binary search tree with n nodes and printing them in an order is a) b) c) d)

A. $O(n)$

B. $O(\sqrt{n})$

C. $O(\log(n))$

D. $O(n \lg(n))$

Answer: Option A