Data Structure and Algorithms Time Allowed 1 Hr (Intake 42)

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* Required

1

Enter Your Name (IN English) *

Youssef Ibrahim Salama

2

Select Your Track *

- Professional Web Development and BI
- [✓ Open Source Application Development]

3

What is the ' next ' field of structure node in the Queue?
(2 Points)

- a. Results into the storage of queue elements.
- [✓ b. Results into the storage of address of next node by holding the next element of queue.]
- c. Results into the memory allocation of data elements to next node.
- d. Results into the address allocation data elements to next node.

4

Linked lists are best suited ....
(2 Points)

- a. For relatively permanent collections of data
- [✓ b. For the size of the structure and the data in the structure are constantly changing]
- c. Data structure
- d. For none of the above situation

5

The operation of processing each element in the list is known as
(2 Points)

- a. Sorting
- b. Merging
- c. Inserting
- [✓ d. Traversal]

6

Each node in a linked list must contain at least
(2 Points)

- a. Three fields
- [✓ b. Two fields]
- c. Four fields
- d. Five fields

7

A Linear list in which the pointer points only to successive node is
(2 Points)

- [✓ a. Single linked list]
- b. Circular linked list
- c. Doubly linkedlist
- d. None of the above

8

The operation that combines the element is of A and B in a single sorted list C with n=r+s element is called ......
(2 Points)

- a. Inserting
- b. Mixing
- [✓ c. Merging]
- d. Sharing

9

The worst case occurs in linear search algorithm when ......
(2 Points)

- a. Item is somewhere in the middle of the array
- b. Item is not in the array at all
- c. Item is the last element in the array
- [✓ d. Item is the last element in the array or item is not there at all]

10

Inorder traversing a tree resulted E A C K F H D B G, the PostOrder traversing of the same tree resulted E C K A H B G D F, So the PreOrder traversing would return:
(2 Points)

- a. FAEKCDBHG
- [✓ b. FAEKCDHGB]
- c. EAFKHDCBG
- d. FEAKDCHBG

11

Traversing a Binary Search tree Pre-Order resulted: F C B A D E H G I J, so the traversing Post order will result:
(2 Points)

- a. ABEDCGIJHF
- b. ABDECFHGIJ
- c. ABEDCGJIHF
- [✓ d. None of the above]

12

What does the following function do for a given Linked List with first node as head?

```
void fun1(struct node* head)
{
    if(head == NULL)
       return;
    fun1(head->next);
    printf("%d  ", head->data);
}
```

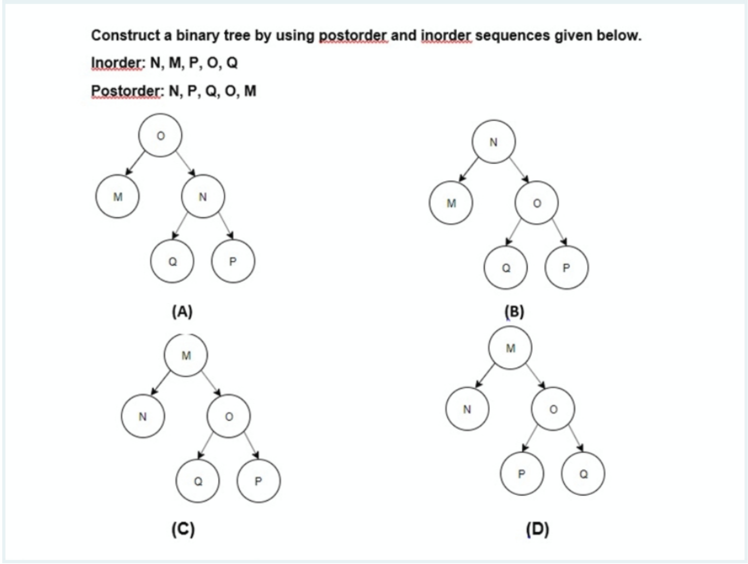
(2 Points)

- a. Prints all nodes of linked lists
- [✓ b. Prints all nodes of linked list in reverse order]
- c. Prints alternate nodes of Linked List
- d. Prints alternate nodes in reverse order

13

Question

(2 Points)



Construct a binary tree by using postorder and inorder sequences given below.

Inorder: N, M, P, O, Q

Postorder: N, P, Q, O, M

- A
- B
- C
- [✓ D]

14

What will be the output of the following program?

```
main()
{
    char str[]="san foundry";
    int len = strlen(str);
    int i;
    for(i=0;i
```

(2 Points)

- a. sanfoundry
- b. san foundry
- c. yrdnuof nas
- d. foundry nas

15

Which of the following code snippet performs linear search recursively?

```
A) LinearSearch(int[] a, n, key)
   {
       for(i=0;i
```

(2 Points)

- A
- B
- C
- D

16

Choose the appropriate code that does binary search using recursion.

```
A) public int recursive(int arr[], int low, int high, int key)
   {
       int mid = low + (high - low)/2;
       if(arr[mid] == key)
       {
              return mid;
       }
       else if(arr[mid] < key)
       {
              return recursive(arr,mid+1,high,key);
       }
       else
       {
              return recursive(arr,low,mid-1,key);
       }
   }
B) public int recursive(int arr[], int low, int high, int key)
   {
       int mid = low + (high + low)/2;
       if(arr[mid] == key)
       {
              return mid;
       }
       else if(arr[mid] < key)
       {
              return recursive(arr,mid-1,high,key);
       }
       else
       {
              return recursive(arr,low,mid+1,key);
       }
   }
C) public int recursive(int arr[], int low, int high, int key)
   {
       int mid = low + (high - low)/2;
       if(arr[mid] == key)
       {
              return mid;
       }
       else if(arr[mid] < key)
       {
              return recursive(arr,mid,high,key);
       }
       else
       {
              return recursive(arr,low,mid-1,key);
       }
   }
D) public int recursive(int arr[], int low, int high, int key)
   {
       int mid = low + ((high - low)/2)+1;
       if(arr[mid] == key)
       {
              return mid;
       }
       else if(arr[mid] < key)
       {
              return recursive(arr,mid,high,key);
       }
       else
       {
              return recursive(arr,low,mid-1,key);
       }
  }
```

(2 Points)

- [✓ A]
- B
- C
- D

17

Choose the correct code for merge sort.

```
A) void merge_sort(int arr[], int left, int right)
  {
     if (left > right)
     {
       int mid = (right-left)/2;
       merge_sort(arr, left, mid);
       merge_sort(arr, mid+1, right);
       merge(arr, left, mid, right); //function to merge sorted arrays
     }
  }
B) void merge_sort(int arr[], int left, int right)
   {
      if (left < right)
      {
         int mid = left+(right-left)/2;
         merge_sort(arr, left, mid);
         merge_sort(arr, mid+1, right);
         merge(arr, left, mid, right); //function to merge sorted arrays
      }
   }
C) void merge_sort(int arr[], int left, int right)
   {
      if (left < right)
      {
          int mid = left+(right-left)/2;
          merge(arr, left, mid, right); //function to merge sorted arrays
          merge_sort(arr, left, mid);
          merge_sort(arr, mid+1, right);

     }
   }
D) void merge_sort(int arr[], int left, int right)
   {
      if (left < right)
      {
          int mid = (right-left)/2;
          merge(arr, left, mid, right); //function to merge sorted arrays
          merge_sort(arr, left, mid);
          merge_sort(arr, mid+1, right);
      }
   }
```

(2 Points)

- ○ A
- [✓ B]
- ○ C
- ○ D

18

What is the output of following function for start pointing to first node of following linked list?

1->2->3->4->5->6

```
void fun(struct node* start)
{
   if(start == NULL)
       return;
   printf("%d  ", start->data);
   if(start->next != NULL )
       fun(start->next->next);
   printf("%d  ", start->data);
}
```

(2 Points)

- ○ a) 1 4 6 6 4 1
- ○ b) 1 3 5 1 3 5
- ○ c) 1 2 3 5
- [✓ d) 1 3 5 5 3 1]

19

The following C function takes a single-linked list of integers as a parameter and rearranges the elements of the list. The function is called with the list containing the integers 1, 2, 3, 4, 5, 6, 7 in the given order. What will be the contents of the list after the function completes execution?

```
struct node
{
    int value;
    struct node *next;
};
void rearrange(struct node *list)
{
    struct node *p, * q;
    int temp;
    if ((!list) || !list->next)
      return;
    p = list;
    q = list->next;
    while(q)
    {
         temp = p->value;
         p->value = q->value;
         q->value = temp;
         p = q->next;
         q = p?p->next:0;
    }
}
```
(2 Points)

- ○ a) 1, 2, 3, 4, 5, 6, 7
- [✓ b) 2, 1, 4, 3, 6, 5, 7]
- ○ c) 1, 3, 2, 5, 4, 7, 6
- ○ d) 2, 3, 4, 5, 6, 7, 1

20

Array implementation of Stack is not dynamic, which of the following statements supports this argument?
(2 Points)

- [✓ a) space allocation for array is fixed and cannot be changed during run-time]
- ○ b) user unable to give the input for stack operations
- ○ c) a runtime exception halts execution
- ○ d) improper program compilation

21

In linked list implementation of a queue, where does a new element be inserted?
(2 Points)

- ○ a) At the head of link list
- ○ b) At the centre position in the link list
- [✓ c) At the tail of the link list]
- ○ d) At any position in the linked list

22

Which of the following is not a disadvantage to the usage of array?
(2 Points)

- ○ a) Fixed size
- ○ b) There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
- ○ c) Insertion based on position
- [✓ d) Accessing elements at specified positions]

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