SGBAU THEORY EXAM-WINTER-2021-DS

Name of Exam : B.E. Third Semester (Computer Science & Engineering) (CBCS) Winter 2021

Subject Name : 3KS04/3KE04 : Data Structures
Date: 28.2.2022
Time : 1 Hour 10a.m-11 a.m.
Maximum Marks : 80

* All 40 MCQ questions are compulsory.

* Every question carries 2 marks.

Hi, Vedant. When you submit this form, the owner will see your name and email address.

* Required

1

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6

Evaluate the prefix notation

S: + ,-, *, 4, 2, 1, 16, 8, 3
(2 Points)

- A) 7
- B) 9

- ◯ C) 11
- ◯ D) 13

7

Consider an array A[-8----76] is stored in memory whose base address is 288 and word size is 4 byte. Which element is available on memory location 412

(2 Points)

- ◯ A) A [22]
- ◯ B)A [42]
- ◯ C) A [23]
- ◯ D) A [43]

8

If minimum two queues are used for the implementation, then which of the implementation is possible with queues.

(2 Points)

- ◯ A) Linked list
- ◯ B) Queues
- ◉ C) Stack
- ◯ D) Array

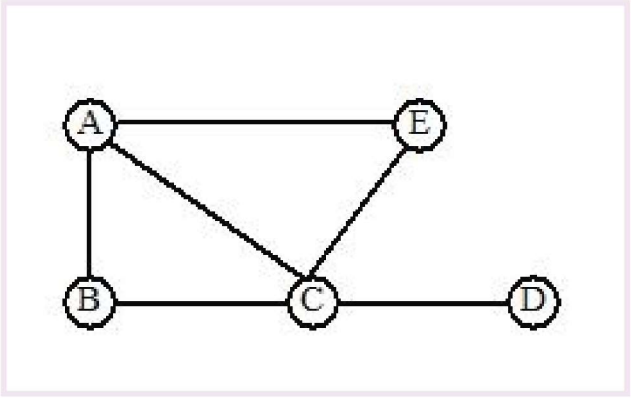
9

"$ $" sign is used for:-

(2 Points)

- A) Concatenate two strings
- B) Separate two strings
- C) Start of string
- D) None of the above

10



Identify the cut vertices from the given graph.

(2 Points)

- A) B & C
- B) C & E
- C) A & C
- D) A & B

11

A perfect binary tree whose height is 'l' has ------- nodes.

(2 Points)

- A) 2l-1
- B) 2l
- C) 2l+1
- D) l2+1

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Which of the following is amongst one of the use/advantage of stack.

(2 Points)

- A) CPU resource allocation
- B) Breadth first traversal
- C) Recursion
- D) Breadth fast traversal

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Find the infix expression from the following?

(2 Points)

- A) A + B * C
- B) + A * BC
- C) ABC + *
- D) ABC * +

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Find the output of the following prefix expression

+,-,*.3,2,1,8,4,7

(2 Points)

- A) 12
- B) 11
- C) 5
- D) 4

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What is the time complexity of the program?

```
Void fun_fun (int n)
    {
       int i, j
       for (i=1 ;  i < = n/3 ;  i++)
          for (j=1 ;  j< = n ; j += 4)
          print f (“Enjoy”) ;
    }
```

(2 Points)

- A) O(N2)
- B) O(2N)
- C) O(2N2)
- D) O (1)

16

Memory allocated by calloc function is initialized to -----

(2 Points)

- A) Zero

- B) Garbage value
- C) -1
- D) None of these

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Void fun (int n)

```
{
    int  i, j, k, Count = 0;
for (i = n/2; i< = n; i++)
for (j =1; j+n/3 < = n ; j++)
    for (k =1, k < = n ; k = k * 2)
        Count ++ ;
    }
```

Find the time complexity of the program

(2 Points)

- A)O(n log n)
- B)O(n2 log n)
- C)O(n2)
- D)O(n log n2)

18

Queues can be implemented using --------?

(2 Points)

- A) Static array
- B) Dynamic array
- C) Both A & B
- D) None of these

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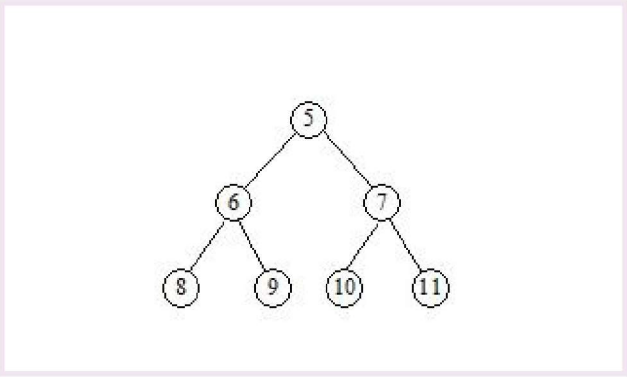

Consider the following tree

If the post-order traversal gives X Y + U V * * then the label of the nodes 5, 6, 7, 8, 9, 10, 11 will be ---?

(2 Points)

- A) X, + Y, *, U, * V
- B) *, +, *, X, Y, U, V
- C) X, Y, U, V, + *, *

D) +, X, Y, *, *, U, V

20

A matrix Arr [10] [20] is stored in memory. If the base address at Arr [2] [I] is 2260, find the address of Arr [5] [4] in column major order. Consider each element requires 2 bytes of storage

(2 Points)

A) 2206

B) 2210

C) 2322

D) 2326

21

By assuming that the height of a tree with single node is O. What will be the maximum height of any Arr-tree with 7 nodes

(2 Points)

A) 2

B) 4

C) 5

D) 3

22

An array A[1....15] [1.....10] with each element requiring 4 bytes of storage is stored in memory. If the base address is 1240, determine the location of A[12] [9] when the array is stored in Row Major Order (RMO)

(2 Points)

- A) 1972
- B) 1724
- C) 1712
- D) 2024

23

Each element of B(-15....40,15.....40)requires two (02) byte of storage. If the base address of array is 1000. Find the address of B(-2,25) in CMO

(2 Points)

- A) 2118
- B) 2240
- C) 2148
- D) 2188

24

If you need to sort any 52 random numbers. You should prefer --------

(2 Points)

- (●) A) Bubble sort
- ( ) B) Quick sort
- ( ) C) Merge sort
- ( ) D) Heap sort

25

What is the maximum number of comparisons need to sort 7 (seven) decimal numbers which is of 03 digits in size.

(2 Points)

- ( ) A) 210
- ( ) B) 200
- ( ) C) 240
- (●) D) 280

26

Consider the sequence of operation

Push (10), Push (20), Push (20), POP, POP,

Push (20), Push (10), Push (30), POP, POP,

Push (30), POP, POP, POP are performed on a stock. The sequence of Popped out values are

(2 Points)

- A) 20, 20, 10, 30, 20, 30, 10
- B) 20, 20, 30, 10, 30, 20, 10
- C) 20 20, 10, 30, 30, 20, 10
- D) 20, 20, 30, 10, 20, 30, 10

27

What will be the output of “COVID” & “CORONA” if we perform S1 || S2

(2 Points)

- A) COVID CORONA
- B) CORONA COVID
- C) COVIDCORONA
- D) None of these

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If S1='XYZ' and S2='ABC' then to achieve output as XYZ ABC, which of the following function will be used

1) S1 || S2

2) S1 || ' ' || S2

3) Strcat (Strcat (S1," "),S2);

4) Strcat(S1," ",S2)

(2 Points)

- A) Statement 2 & 4 is correct
- B) Statement 1 & 4 is correct
- C) Statements 2, 3 & 4 are correct
- D) Statement 2 & 3 is correct

29

How many parameters are needed to write a procedure / algorithm for POP operation of stack?

(2 Points)

- A) 5
- B) 4
- C) 6
- D) 3

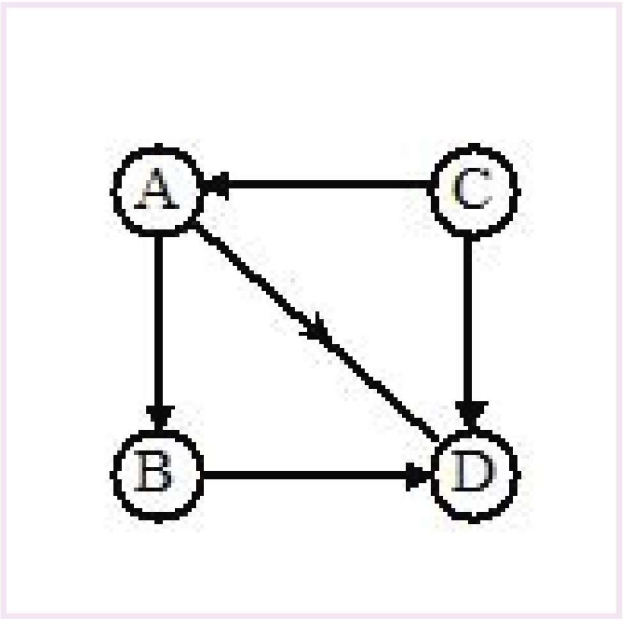
30

Consider a queue of size =7 is declared and currently front = rear = 0 then:-

(2 Points)

- A) Queue is empty
- B) Queue is full
- C) Queue contains one element
- D) None of the above

31



Consider the following figure / nodes.

Which of the following is a Valid topological sorting?

(2 Points)

A) ABDC

B) BDCA

C) CABD

D) DCAB

32

The number of possible binary tree with 3 nodes & 4 nodes respectively are ----
--&-----

(2 Points)

A) 12 & 12

B) 13 & 13

C) 5 & 14

D) 15 & 15

33

$$T(n) = (+T(n-1), \quad \text{if } n > 1$$
$$= d \quad , \quad \text{if } n \leq 1$$

T(n) represents the running time, where 'n' is the input size of a recursive algorithm T(n) is defined as follows:

The order of this algorithm is

(2 Points)

- ○ A)n2
- ◉ B) n
- ○ C)n3
- ○ D)nn

34

Depth-first search can be consider similar / same as:-

(2 Points)

- ○ A) Inorder
- ◉ B) Preorder
- ○ C) Postorder
- ○ D) Linear order

35

In a simple graph, what is the maximum degree of any vertex with n vertices is ----

(2 Points)

- ○ A) n
- ○ B) n + 1
- ○ C) 2n - 1
- ◉ D) n – 1

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Consider a regular graph of degree d and vertices n. The number of edges in a graph is -----

(2 Points)

- A) nd/2
- B) n + d
- C) nd
- D)(n2-d)+1

37

Evaluate the prefix notation

Q: *, +, -, 6, 2, *, +, 5, 2

(2 Points)

- A) 25
- B) 126
- C) 186
- D) 157

38

Consider an array A[-8----76] is stored in memory whose base address is 288 and word size is 4 byte. At which memory location, we will find element A[23]

(2 Points)

- A) 422
- B) 432
- C) 452
- D) 412 (selected)

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What is the output of the following program / Code which includes NULL pointer.

```
    int main ( )
{
    int * ptr = NULL ;
    Printf
    return  0;
}
```

(2 Points)

- A) NULL (selected)
- B) Garbage value

C) O

D) Zero

40

What is the size of the following NULL Pointer?

```
int main ( )
{
Printf
return O;
}
```

(2 Points)

A) O

B) NULL

C) 4

D) Depends on platform/ machine

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A structure is of the form if condition, then:

[Module A]

Else

[Module B]

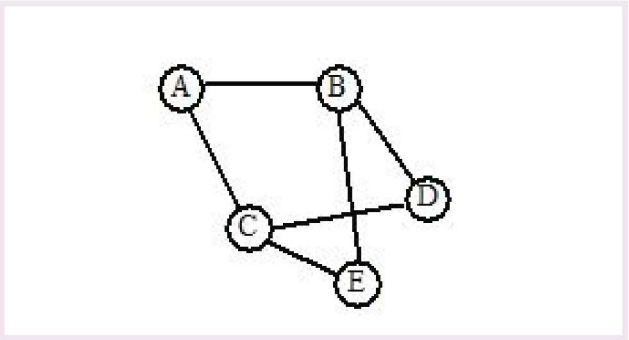
[End of if structures]

What is this structure?

(2 Points)

- A) Multiple alternative
- B) Double Alternative
- C) Single Alternative
- D) None of the above

42



Which of the following statement is true about the given graph?
(2 Points)

- A) G is a complete graph

- ○ B) G is a connected graph
- ◉ C) The vertex connectivity of a graph is 2
- ○ D) the edge connectivity of the graph is 1

43

Convert the following Infix to prefix notation?

I=(D-E/F) *(D/K-L)

(2 Points)

- ○ A) *-DEF/-/DKL
- ○ B)*-DE/F-/DKL
- ○ C)*-DE/F/-DKL
- ◉ D)*-D/EF-/DKL

44

Circular linked list may lead to --------

(2 Points)

- ○ A) Infinite loop
- ○ B) Time consuming traverse
- ○ C) Requires more memory space
- ◉ D) All of the above

45

Which is the efficient data structure in tree-construction.

(2 Points)

- A) Stack
- B) Queue
- C) Array
- D) Linked list

Submit