Star Coder Program 2024 (Initial Screening Test)

Welcome to Brain Station 23 Ltd.
This MS form will be open at **10:00 PM, 17th January 2024.**
Time Duration: **45 Minutes (10:00 PM to 10:45 PM)**
You will get 5 minutes to fill up the general information (1-10) and 40 minutes to answer the questions (11-57)

* Required

1

Name (As per NID/Birth Certificate/Passport) *

Enter your answer

2

Email (Please ensure that you provide the email address to which you received the invitation for this exam) *

Enter your answer

3

Contact Number (Do not add any space or "-") - Example: 01XXXXXXXXX *

The value must be a number

4

University (Do not write the short form) *

Enter your answer

5

Degree (B.Sc/B.B.A/BA/Diploma/others) *

Enter your answer

6

Program (CSE/EEE/SE/IT/others) *

Enter your answer

7

Graduation Year *

The value must be a number

8

1st Priority *

- Asp.Net
- Python
- PHP
- JAVA
- Vue
- React
- Angular
- Node
- Flutter
- iOS
- Android
- Unity
- ML
- Blockchain
- Odoo
- QA Automation

9

2nd Priority *

- Asp.Net
- Python
- PHP
- JAVA
- Vue
- React
- Angular
- Node
- Flutter
- iOS
- Android
- Unity
- ML
- Blockchain
- Odoo
- QA Automation

10

3rd Priority *

- Asp.Net
- Python
- PHP
- JAVA
- Vue
- React
- Angular
- Node
- Flutter
- iOS
- Android
- Unity
- ML
- Blockchain
- Odoo
- QA Automation

- ◯ Others

11

(2.5 Points)

Which of the following statements about a Max Heap is

- ◯ The parent node has a value smaller than its children.
- ◯ It is a complete binary tree.
- ◯ The smallest element is always at the root.
- ◯ Deletion of an element is performed from the front

12

In the following code snippet, what does the keyword 'this' refer to

```
class Employee {
    private String name;
    public Employee(String name) {
        this.name = name;
}
}
```

- ◯ The class variable.
- ◯ The constructor variable.

- ◯ The current object of the class.
- ◯ The class itself.

13

(2.5 Points)

Which SQL clause is used to filter the results of a q

- ◯ ORDER BY
- ◯ GROUP BY
- ◯ WHERE
- ◯ HAVING

14

Which of the following statements is false for dynamic programming?

- ◯ Given problem is broken up into smaller sub-problems
- ◯ the optimal solutions to the subproblems contribute to the problem's optimal solution.
- ◯ Can be implemented using a recursive algorithm.
- ◯ Does not guarantee to find optimal solutions for problems

15

(2.5 Points)

Consider the following tables:

Employee Table:

EmployeeID	Name
1	Alice
2	Bob
3	Charlie

Salary Table:

SalaryID	EmployeeID
101	1
102	1
103	2

What is the result of the following SQL query?

```
SELECT Name, COUNT(SalaryID) as SalaryCount FROM Employees
LEFT JOIN Salaries ON Employees.EmployeeID = Salaries.EmployeeID
GROUP BY Name ORDER BY SalaryCount DESC Limit 1;
```

- Alice, 2
- Bob, 1
- Charlie, 0
- Bob, 2

16

(2.5 Points)

What is the primary objective of the planning phase in the Software Deve Life Cycle (SDLC)?

- To gather requirements
- To create the system architecture
- To define the scope, schedule, and resources for the project
- To conduct testing activities

17

(2.5 Points)

What will be the output of the following code?

```c
#include <stdio.h>
int main() {
    int i = 1;
    while(i++ <= 1);
    while(i++ <=2);
    printf("i = %d", i);
    return 0;
}

```

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

18

(2.5 Points)

The software development team is estimating the time required to deve
feature. The feature consists of 3 tasks, each task expected to take 40
complete. The team works 8 hours per day, and they have 2 days off ir
How many weeks will it take to finish the entire feature?

- ◯ 1 week
- ◯ 2.5 weeks
- ◯ 3 weeks
- ◯ 5 weeks

19

(2.5 Points)

Four friends (Tarekul, Planet, Faisal, Ixion) had a race to see who could distance of 100 meters in the least amount of time. Ixion was faster than Planet beat Ixion but came in behind Tarekul. Who came in last?

- ◯ Ixion
- ◯ Tarekul
- ◯ Planet
- ◯ Faisal

20

In the context of the Software Development Life Cycle (SDLC), which mo emphasizes the continuous iteration of the development and testing phas throughout the project, accommodating changes in requirements even la development process?

- ◯ Waterfall Model
- ◯ V-Model

- Spiral Model
- Agile Model

21

(2.5 Points)

Class Z inherits class Y. And Y has inherited class X. Then while c the object of class Z, what will be the sequence of constructors ge called?

- Constructor of Z then Y, finally of X
- Constructor of X then Z, finally of Y
- Constructor of Z then X, finally Y
- Constructor of X then Y, finally Z

22

(2.5 Points)

Which one is true for Superclass and Subclass in

- In Single Level Inheritance there is many Superclass
- In Hierarchical Inheritance there is One Subclass
- A Superclass can use properties outside subclass

- ◯ There is One Superclass in Single level Inheritance

23

(2.5 Points)

Which traversal of a Binary Search Tree (BST) will result in a sorted sequ elements?

- ◯ Preorder
- ◯ Inorder
- ◯ Postorder
- ◯ Level-order

24

(2.5 Points)

Mr. X is looking for a data structure for his new application so that the co of data insertion, deletion, and search operation remains optimal in the w case scenario. Which of the following data structure should he choose?

- ◯ Binary Search Tree
- ◯ Balanced Binary Search Tree
- ◯ Array
- ◯ Queue

25

(2.5 Points)

In the maintenance phase the product must be tested against prev cases. This is known as _____ testing.

- Unit
- Regression
- Acceptance
- Integration

26

(2.5 Points)

Which sorting algorithm is known for its worst-case time complexity of O with a best-case time complexity of O(n) when the input is nearly sorted?

- Quick Sort
- Merge Sort
- Bubble Sort
- Insertion Sort

27

Mr. Joy is planning to build a web browser. Now he is analyzing requirements for the navigation system of his web browser, which will

preserve the browsing history. What is the appropriate data structure to use for the navigation system?

- Array
- Stack
- Queue
- Linked list

28

(2.5 Points)

Which of the following statements is false for the singly lin

- It contains a pointer that points to the previous node.
- It only can traverse in one direction
- The last node called the tail, which points to NULL.
- Time complexity of insertion is O(n)

29

Which following statement is false about Relational Database Management System?

- Data is an unprocessed fact.
- Information is processed data.

- A database is a collection of non-related data.
- DBMS must include concurrency control

30

(2.5 Points)

In the current semester schedule, with today being Friday, the data st
exam is scheduled for tomorrow, and the algorithm exam is set for the
tomorrow. If the database exam was conducted 4 days before the alg
exam, on which day did the database exam take place?

- Monday
- Tuesday
- Wednesday
- Thursday

31

(2.5 Points)

What type of casting is demonstrated in the following cc

```
class Employee{
    ...
}
class Manager extends Employee {
    ...
}
Employee employee = new Manager ();
```

- ◯ Upcasting
- ◯ Downcasting
- ◯ Both Upcasting and Downcasting
- ◯ No casting

32

(2.5 Points)

Which of the following sorting algorithms performs least efficiently in w scenarios?

- ◯ Merge sort
- ◯ Heap sort
- ◯ Quick sort
- ◯ Counting sort

33

(2.5 Points)

What will be the output of the code?

```
#include <stdio.h>
int factorial(int n) {
    if (n == 0 || n == 1) {
        return _____;
    } else {
        return n * factorial(n - 1);
    }
}

int main() {
    printf("Factorial: %d", factorial(5
    return 0;
}
```

- 9
- 10
- 15

16

34

(2.5 Points)

What is the purpose of the ACID properties in database management s

To improve query performance

To guarantee the reliability of data

To enforce referential integrity

To optimize storage efficiency

35

(2.5 Points)

Mr. X has been assigned homework to determine the square root of a number. Which of the following algorithms can he use to solve this m problem?

Kruskal's algorithm

Breadth First Traversal

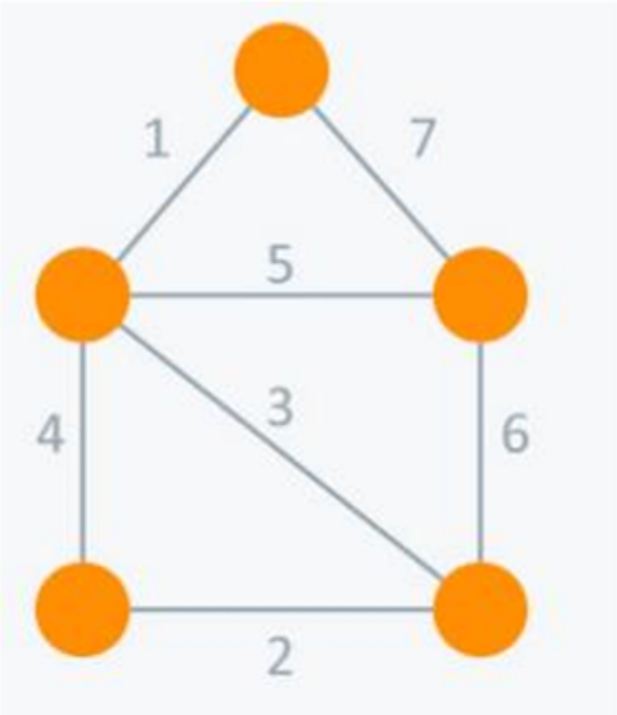
Counting Sort

Binary Search

36

(2.5 Points)

What will the total cost of minimum spanning tree of the given



- 15
- 17
- 11
- 16

37

(2.5 Points)

Which of the following statements is correct to display all the students with th **address**, and **age** whose age is in the range of **15 to 20** from the 'student' ta

- SELECT * FROM student WHERE age IN (15 to 20)
- SELECT * FROM student WHERE age BETWEEN 15 AND 20
- SELECT * FROM student WHERE age NOT IN (15 AND 20)
- SELECT * FROM student WHERE age NOT BETWEEN 15 AND 20

38

(2.5 Points)

Which of the following is true about method overloading in

- The method signature must include the return type
- The return type of overloaded methods must be the same
- The number and types of parameters must be the same
- The number and types of parameters must be different

39

(2.5 Points)

Which of the following is the best way to achieve both abstract code reusability in OOP?

- Using global variables
- Using function overloading
- Using inheritance

- ◯ Using abstract classes

40

(2.5 Points)

Explain the concept of interface in OOP and its significan

- ◯ An interface is a concrete class that provides a default implementation for methods.
- ◯ An interface is a collection of method signatures without any implementation.
- ◯ An interface is a type of inheritance used to extend a class.
- ◯ An interface is a way to encapsulate data within a class.

41

(2.5 Points)

Which one of the following is a functional requirer

- ◯ Maintainability
- ◯ Portability
- ◯ Business needs
- ◯ Reliability

42

(2.5 Points)

What is the primary purpose of the Disjoint Set (Union-Find) data s

- Efficient sorting of elements.
- Fast searching in a sorted array.
- Keeping track of a partition of a set into disjoint subsets.
- Storing and retrieving key-value pairs with constant-time complexity

43

(2.5 Points)

Bell A rings every 2 minutes and B rings every 3 minutes. If the be simultaneously at 1pm. What is the total number of times the bells simultaneously between 1pm and 2pm inclusive?

- 12
- 11
- 10
- 9

44

(2.5 Points)

Suppose there are 100 products, each rated on a scale of 1-10. If you store the frequency of each rating, how many items are required in the array? -

- 10
- 90
- 100
- 110

45

(2.5 Points)

Who holds the responsibility for writing unit tes

- Users
- Customers
- Developers
- Project managers

46

(2.5 Points)

In terms of operations efficiency, which of the following data structure suitable for rearranging elements, if the location of elements is known

- ◯ Array
- ◯ Stack
- ◯ Queue
- ◯ Linked list

47

(2.5 Points)

Given an array of integers ‘nums’ and an integer ‘target’, return indices of t
numbers such that they add up to ‘target’. You may assume that each inpu
would have exactly one solution, and you may not use the same element t
You can return the answer in any order.

Input: nums = [2,7,11,15], target = 9
Output: [0,1]

What is the most efficient time complexity for solving this problem?

- ◯ O(1)
- ◯ O(n)
- ◯ O(nlogn)
- ◯ O(n^2)

48

What will be the output of the following code?

```c
#include <stdio.h>
int main() {
        int sum = 7 + 6 / 3 + 14 * 2;
        printf("%d", sum);
        return 0;
}
```

- 37
- 16
- 17
- 33.5

49

(2.5 Points)

```
SELECT e.name, e.salary FROM employees e WHERE
e.salary = (SELECT MAX(salary) FROM employees WHERE department = 'IT'
```

What does this query return?

- Names and salaries of all employees in the 'IT' department.
- Names and salaries of the highest-paid employee in the 'IT' department.
- Names and salaries of all employees in the company.

- ◯ Names and salaries of the highest-paid employee in the company.

50

If the area of a rectangular region is equal to the area of a square, then the perimeter of the rectangular must be –

- ◯ Half the perimeter of the square
- ◯ Equal to the perimeter of the square
- ◯ Equal to twice the perimeter of the square
- ◯ None of the above

51

(2.5 Points)

Which of the following statements is false in SQL?

- ◯ We can use a DROP statement to remove a database or table permanently from the system.
- ◯ A relation may have multiple foreign keys
- ◯ Primary Key does allow the Null Values. where as in Unique key doesn't accept the Null values
- ◯ SQL Server automatically sets the NOT NULL constraint for all the primary key columns if the NOT NULL constraint is not specified for these columns

52

(2.5 Points)

What will be the output of the following code?

```c
#include <stdio.h>

int main(void) {
    int x = 22, i;
    for(i = 0; i < x; i+=5) {
        printf("Real ");
        if(i == 5 || i == 15)
            continue;
        printf("Madrid ");
    }
     return 0;
}

```

- Real Madrid Real Real Madrid Real Real Madrid
- Real Madrid Real Real Madrid Real
- Real Madrid Real Madrid Real Madrid
- Real

53

(2.5 Points)

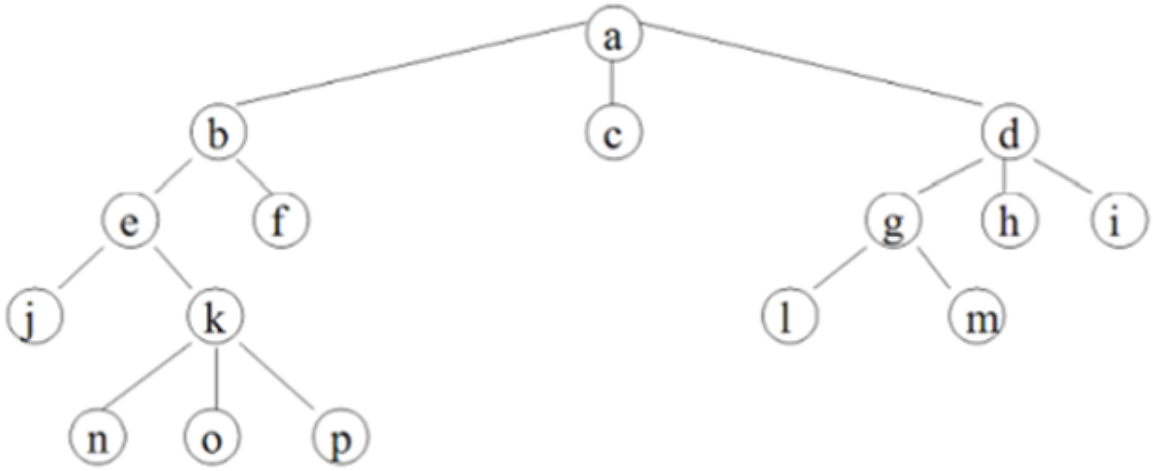
A man walks 5 miles south, then 5 miles east, and finally, 5 miles north direction is he from his starting point?

- North
- East
- South
- West

54

(2.5 Points)

Consider the tree given below. The prefix expression will be:



- abcdefjknopglmhi
- abejknopfcdglmhi
- jenopkfbclmghida

- ◯ None of above

55

(2.5 Points)

Suppose a class W is inherited by class X and Y, again a class Z is inherit X, which type of inheritance does this example fits to?

- ◯ Single Inheritance
- ◯ Hierarchical Inheritance
- ◯ Multiple Inheritance
- ◯ None of the above

56

(2.5 Points)

Given a table named "employees" with columns "employee_id" and write an SQL query to find the second-highest salary.

- ◯ SELECT MAX(salary) FROM employees;
- ◯ SELECT TOP 2 salary FROM employees ORDER BY salary DESC;
- ◯ SELECT DISTINCT salary FROM employees ORDER BY salary DESC LIMIT 1 OFFSET 1;
- ◯ SELECT MAX(salary) FROM employees WHERE salary < (SELECT MAX(salary) FROM employees)

57

(2.5 Points)

What will be the output of the code? -

```
#include <stdio.h>
int main() {
    int num = 10;
    int *ptr1 = &num;
    int *ptr2 = ptr1;
    (*ptr1)++;
    (*ptr2) += 5;
    int result = num;
    printf("%d", result--);
    return 0;
}
```

- 12
- 11
- 10
- 15

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