**Developer screening - sample questionnaire (Total Time - 2 hours)**

**C#, OOP (20 min)**

1. What is the difference between a class and an Interface
2. Class has both definition and an implementation whereas Interface only has a definition.
3. Class can be instantiated, but an Interface cannot be instantiated. We can create an instance of an object that implements the Interface.
4. Class can have properties, methods along with there definition and implementation. Interface has definition that you must implement in the class inheriting that Interface.
5. Can We Inherit Multiple Interfaces ?
6. We can inherhit multiple interfaces in C#. We cannot inherit multiple classes in C#.
7. What are the fundamental OOP concepts?
8. Abstraction - Abstraction shows only what is necessary e.g. customer code, name, address are what we need to create customer component.
9. Encapsulation - Encapsulation hides complexity . Encapsulation implements abstraction e.g. validate() createDBObject() can be encapsulated in add() method to show how customer component can be added to database.
10. Inheritance – Allow child class to inherit the base class methods, properties. It gives important feature of reusability.
11. Polymorphism – Polymorphism means more than one forms. Its of two types method overloading and mehtod overriding.
12. What are the different types of classes in C#?
13. Sealed class.
14. Partial class.
15. Static class.
16. Abstract class
17. How is Exception Handling implemented in C#?
18. Exceptions are handling using try, catch, finally blocks in C# or the Exception can be thrown using throw statement.
19. What are access modifiers and name them
20. It defines the accessibility for methods, variables. They are of following types private, public, protected, protected-internal and internal.
21. Can We Prevent My Class From Being Inherited And Becoming A Base Class From The Other Classes ?
22. Yes  make MyClass as sealed class.
23. How Does Method Overloading Different From Overriding
24. Method Overloading - same methodname but different parameters. Does not require inheritance. It is done in same class.
25. Method Overriding – same method name and parameters but one is present in child class and other is in parent class. Overriding needs inheritance.
26. Can We Override Private Virtual Method ?
27. No we cant  override virtual private method as we cannot declare virtual private method as private methods are not visible.
28. What is an Array? Give the syntax for a single and multi-dimensional array?
29. An array is used to store a collection of data of same type.  Single Dimension arraye.g. int[] array = new int[5];
30. Multi dimension array example - int[,] muliArray = new int[5, 2] { { 1, 2 }, { 3, 4 }, { 5, 6 }, { 7, 8 } ,{9,0}};
31. We have two classes class1  and class2,  class2inherit class1  . If we make the object of class2 then which class's constructor called first?
32. Class 1 constructor will be called first then the class2 constructor will be called.
33. What will be the output of the following code?

Public abstract class baseClass

{

      Void Print()

     {

           Console.WriteLine(“BaseClass Constructor”)

     }

     Public abstract void print1();

}

Public class ChildClass : BaseClass

{

      Public void Print1()

}

It will give compilation error to implement print1 of abstract baseClass else make public childClass as abstract class and make print1 as abstract.

**SQL (15 min)**

1. What is the difference between Primary key and Unique key?
2. Primary Key– Cannot accept null values. Only one primary key can be present. Creates clustered index.
3. Unique Key– Can accept one null value. More than one unique key can be present. Creates non- clustered index.
4. Does View contain Data?
5. View doesn’t contain data. View contans result-set of SQL statement.
6. What are Views used for?
7. Views display only selected data.Data is in the virtual table, not stored permanently.  We can also use sql joins in the select query in deriving the data for the view.
8. What is a Relationship and what are they?
9. Relationships are defined using primary and foreign key constraints.

Types of Relationships - One-One Relationship    
One-Many Relationship, Many-Many Relationship.

1. What are table valued and scalar functions?
2. Table Valued function – return table variable as a result.
3. Scalar function – returns single value as a result.
4. How can you insert NULL values in a column while inserting the data?
5. First way is while creating table allow nulls for the column.

CREATE TABLE Persons (    FirstName varchar(255) NULL);

1. Second way is Insert into table Persons(FirstName, LastName ) values("kiran’,null) but here lastname should allow null.
2. Write a SQL query to display the current date
3. SELECT GETDATE();
4. What is subquery in SQL?
5. A subquery is a query within another query. A subquery returns result to main query to filter out results.
6. What is the difference between DELETE and TRUNiCATE statements?
7. Truncate : Truncate is a DDL command. We cannot use the Where clause with Truncate. It removes all rows from a table. Truncate is faster than Delete.
8. Delete : Delete is a DML command. We can use Where clause with Delete. Delete can be used to filter records with where clause to be deleted.

1. Answer below questions based on the entities provided **(10min)**

**Department:**

|  |  |
| --- | --- |
| **Department\_No** | **Department\_Name** |
| 10 | ECE |
| 20 | ECE |
| 30 | CSE |
| 40 | IT |

**Employee Details:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employee\_No** | **Emp\_Name** | **Address** | **Age** | **Department\_No** | **Salary** |
| 1 | Anil | Hyderabad | 23 | 10 | 20000 |
| 2 | Sunil | Hyderabad | 22 | 10 | 21000 |
| 3 | Ajay | Chennai | 24 | 20 | 23000 |
| 4 | Vijay | Chennai | 25 | 30 | 22000 |
| 5 | James | Hyderabad | 24 | 50 | 230000 |

1. Write a Query to display employee details who are working in ECE department?

       SELECT Employee\_No, Emp\_Name, [address], Age, Salary

       FROM Department D INNER JOIN Employee E

       ON D.Department\_No = E.Department\_No

WHERE Department\_Name = 'ECE'

1. Write a Query to display employee details along with department\_name?

        SELECT Employee\_No, Emp\_Name, [address], Age, Salary , Department\_Name

        FROM Department D INNER JOIN Employee E

ON D.Department\_No = E.Department\_No

1. Write a Query to display employee details whose sal>20000 and who is working in ECE department?

        SELECT Employee\_No, Emp\_Name, [address], Age, Salary

         FROM Department D INNER JOIN Employee E

         ON D.Department\_No = E.Department\_No

WHERE Department\_Name = 'ECE' AND Salary > 20000

1. Write a Query to display employee details along with department\_name and who is working in ECE department, whose name starts with a?

         SELECT Employee\_No, Emp\_Name, [address], Age, Salary , Department\_Name

         FROM Department D INNER JOIN Employee E

        ON D.Department\_No = E.Department\_No

WHERE Department\_Name = 'ECE' AND Emp\_Name like 'a%'

1. Write a Query to display employee details along with department\_name and whose age between 20 and 24?

         SELECT Employee\_No, Emp\_Name, [address], Age, Salary , Department\_Name

         FROM Department D INNER JOIN Employee E

         ON D.Department\_No = E.Department\_No

WHERE Age between 20 AND 24

1. Write a Query to display employee detail with 2nd highest salary

Select \* from

(

SELECT ROW\_NUMBER() over (ORDER BY Salary DESC) as higestSalary, Employee\_No, Emp\_Name, [address], Age, Salary

FROM Employee E

) A where A.higestSalary=2

**Programming**

1. **Programming Task 1 (15 min)**

* Create a MVC web application to display a text pass as a parameter to the controller method and display it in the web form.

<https://github.com/kiranakhale/Task1>

1. **Programming Task 2 (1 hour)**

Build a .NET/C# REST API application with Angular 2+ and Bootstrap front-end framework. Specific requirements are below.

* The application should provide a UI form with input fields as training name, start date, end date, and a Confirm button to submit the form.

* If the end date is before the start date, the application should display an error message and the message text should be defined externally.

* On Confirmation of saving the training name, start date and end date REST API should save details to DB and respond with Success message. Along with message, application should display number of days between the two date inputs.

* Unit/Integration test cases are mandatory

Angular Application

<https://github.com/kiranakhale/DeveloperAssignement3UI>

API Application

<https://github.com/kiranakhale/DeveloperAssignement3>

Note - Please see the read me document of each application to configure it on local machine.