

General Software Developer Knowledge Test

Please follow the instructions.

1. Don’t forget to complete your personal details on the Candidate’s Information Sheet
2. Check that your Exam Paper consists of 11 pages.
3. Answer all Questions on the extra paper block
4. Duration of Exam: 3 hours
5. Maximum marks 100 + individual points per bonus question
6. Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Answer ALL the questions.

GOOD LUCK!!!

|  |  |
| --- | --- |
| **Name:** |  |
| **Address:** |  |
| **Telephone Number:** |  |
| **Email:** |  |
| **Interested in:**  What type of position would you like us to contact you about? i.e. Software Development, Support, Implementations, Business Consulting, Administration, Documentation |  |
| **Language Skills:** | **Mother Tongue:**  **Other Languages:**    **Fluent in English? Yes No**  (Tick as appropriate) |
| **Travel Availability:**  Are you willing to travel in the Middle East & Africa and what is the % of travelling accepted? | **Yes** **No**      ………**%** |
| **Is there anything related to work that you are not willing to do/learn?**  i.e. work after hours when needed, certain technologies not willing to learn etc. | **Yes No**      **If Yes, please explain:** |
| **Reason for leaving existing job (if any)** |  |
| **Why do you want to work for NCR?** |  |
| **What are your strengths and what are your weaknesses?** |  |
| **Anticipated salary & benefits:**  **What salary/benefits are you looking for?** |  |
| **Availability:**  **When could you start?** |  |
| **Any other comments**  (Please add anything that you would like us to consider while reviewing your application) |  |

Question 1 (10 marks)

1. What will be the output for the below code?

|  |
| --- |
| public static void Main(string[] args)      {          int x = 0;          int y = 0;            for (short z = 0; z < 3; z++)          {              if ((++x > 1) || (++y > 1))              {                  x++;              }          }          Console.WriteLine(x + "" + y);      } |

1. What is Inheritance?
2. What is method overriding?
3. What is an abstract class?
4. What is a constructor?

Question 2 (20 marks)

Below is an HTML extract page:

|  |
| --- |
| <html>  <head>  </head>  <body>  <div>  Name: <input id="name" type="text" name="name">  </div>  <div>  Age: <input id="age" type="number" name="age">  </div>  <br/>  <input type="submit" value="Submit" onclick="validateAge()">  <br/>  <div id="result" style="display: none">  <p>Person name is: <span id="name1">0</span>.</p>  <p>Person is a(n) <span id="ageLiteral">0</span>.</p>  </div>  <script>  // Your code goes here  </script>  </body>  </html> |

Write a function with name “validateAge()” in JavaScript that will take the input of field “age”, it will validate it against its numeric value and it will present the results in the “result” div.

More specifically, here are the validation rules:

• If the age is lower than or equal to 15, then the person is a “Teenager”.

• If the age is lower than or equal to 25, then the person is a “Young adult”.

• If the age is lower than or equal to 55, then the person is an “Adult”.

• If the age is more than 55, then person is a “Middle aged”.

­The function should append the name of the person to “name1” span and the age literal to “ageLiteral” span. Please note that the “result” div should be visible at the end of the execution.

Question 3 (30 marks)

Natural Language Calculator

Write an object-oriented application to perform simple natural language calculations?

For example, if the user enters the text ‘two plus four’ the program would output the value ‘6’.

Please avoid using libraries or scripting engines, for this exercise we want to see how you would implement the solution yourself.

**Specification**

Supported Input Values

* The supported input values are the whole numbers between zero and ten inclusive.
* Input values must be expressed as text, e.g. ‘one’, ‘ﬁve’, etc.
* Input values are not case-sensitive. Both ‘two and ‘TWO’ are equally valid.

Supported Arithmetic Operators

* The supported arithmetic operators and the permitted natural language aliases for these commands are detailed in the table below.
* Aliases are not case-sensitive. Both ‘add’ and ‘ADD’ are equally valid.

|  |  |
| --- | --- |
| **Operator** | **Permitted Aliases** |
| Add (+) | Add, plus |
| Subtract (-) | Subtract, minus, less |

Operation Chaining

* Any number of operations may be chained together. For example, these calculations are all valid
  + ‘one plus two’
  + ‘seven plus eight minus nine’
  + ‘four plus ﬁve subtract six add one less nine’

Notes

* Note that there is no requirement to support the use of brackets.
* Empty spaces should be ignored
* If the string is invalid, we should return 0

Question 4 (30 marks)

You get an investigation report from the customer that some transactions are randomly failing on the ATM.

You request the server logs from the customer and you find out that all the web service responses are successful.

What are your next steps to find the root cause of the declining transactions and resolve the issue?

Question 5 (20 marks)

**Answer the following technical questions:**

1. **What is a regular expression? How can it be used?**
2. **Define regexp pattern and search string to find occurrences of that pattern**
3. **What is Memory leak/CPU drain in c#**
4. **How would you implement a logging mechanism in an application to get enough information but not overload the application**.
5. **Can I represent an application flow diagram with XML and integrate with code behind?**
6. **Describe a mechanism/architecture to make changes to the application during runtime or by a simple restart and maintain those changes (persistence). Optimizations?**
7. **Explain the various types of testing from development to production.**
8. **We integrated the application with the customer's backend and nothing is working/application is crashing/hanging/other unexpected behaviors. How would you investigate this issue? How could I avoid such situation but still be able to identify the issues with back end communication.**
9. **What is continuous integration?**

Bonus Question 1

**Decode the following message:**

carrot fiasco nephew spring rabbit

sonata tailor bureau legacy corona

travel bikini object happen soften

parrot effigy canada mother aboral

esteem lexica darwin accuse report

**Answer:**

Bonus Question 2

**Distances from you to certain cities are written below.**

BERLIN 200 miles

PARIS 300 miles

ROME 400 miles

AMSTERDAM 300 miles

PRETORIA ??? miles

**How far should it be to Pretoria?**

**Answer:**

Bonus Question 3

**Six drinking glasses stand in a row, with the first three full of juice and the next three empty. By moving only one glass can you arrange them so empty and full glasses alternate?**

Bonus Question 4

**How can you measure out exactly 4 Litres of water from a tap using a 3 Litre and a 5 Litre bucket?**