**SOLUTION**

**Data Structures and Algorithms (Quiz 1) (Time: 20 mins)**

**Marks = 20**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Q1. Find the RUNNING Time of the following algorithm: (05)**

1

1

1 + N/2 + (N/2+1)

1+N2 + N2+ 1

3 N2

3N/2

**int sum = 0;**

**int product = 1;**

**for(int s = 0; s < N; s+=2)**

**{**

**for(int t = 0, t <= s; t++)**

**{**

**sum += s+t;**

**}**

**product \*= s\*t;**

**}**

**Q2.what is stack overflow and underflow? (05)**

**Stack Overflow**

**When the stack contains equal number of elements as per its capacity and no more elements can be added, the status of stack is known as stack overflow**

**Stack Underflow**

**When there is no element in the stack or stack holds elements less than its capacity, the status of stack is known as stack underflow.**

**Q3. Complete the statements: (05)**

1. **A pointer variable stores an address of a variable.**
2. **double num = 123.09;**

**double \*pnum = &num;**

1. **\* OR Dereference operator is used to access the contents of memory location stored by a pointer.**
2. **LIFO means \_Last In First Out\_\_\_\_\_\_\_\_.**
3. **In static implementation stacks have \_\_Fix\_\_\_\_\_\_\_\_ size and in dynamic implementation stacks \_\_\_\_\_\_Variable\_\_\_\_\_\_\_\_\_\_\_\_\_ size.**

**Q4. POP all the four elements from the stack in Figure 1 using pop function below. Write down the value of top for each element and also write down the popped element: (05)**

**void IntStack::pop()**

**{**

**if(top == -1)**

**cout<<"Stack Underflow"<<endl;**

**else**

**{**

**cout<<"Number Deleted From the stack=";**

**cout<<stackArray[top];**

**top--;**

**}**

**}**

200

600

300

100

top

3

2

1

0

bottom

**Figure 1**

|  |  |
| --- | --- |
| **Top** | **Popped Element** |
| **3** | **200** |
| **2** | **600** |
| **1** | **300** |
| **0** | **100** |