Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology Midterm
Examination, Spring-2024
Course Code: STA 101, Course Title: Statistics I
Level: 2 Term:1 Batch: 40
Sections & Teachers: All

__Time: 1 Hour and 30 Minutes__   Marks: 25

Answer __ALL__ Questions [Optional]
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Consider the set of all students of Software Engineering department, DIU enrolled Statistics I course this semester. Suppose you are interested to know the current grade point average (GPA's) of the students. **Define** the population and variable of interest. Is the variable qualitative or quantitative?	[2]	CLO1 Level-1
	b)	What are the common measures of central tendency? In the presence of outlier(s) Which measure of central tendency is more representative and why?	[3]	
2.		To evaluate the effectiveness of a processor for a certain type of task, a computer scientist recorded the CPU time (in seconds) for n = 20 randomly chosen jobs: 24 32 27 19 35 43 29 25 23 28 16 86 48 61 76 36 77 68 50 , 92		CLO2
	a)	Draw a Histogram for the frequency distribution. What percent of jobs are taken in less than 1 minute?	[4]	Level-2
	b)	Investigate that there is any outlier(s) in the above dataset? Also **Construct** a simple Box-Whisker plot and **comment** about the shape of the distribution of CPU time.	[6]	Level-3
	c)	In a survey of 10 SWE students, we gathered data on their weekly coding practice (in hour). The recorded times are as follows: 3.0, 2.9, 3.1, 3.6, 3.4, 2.2, 4.1, 3.5, 2.8, 4.3. **Make use of** the formula of Skewness and **comment** on your results.	[3]	Level-3
3.	a)	Two Cricketers scored the following runs in randomly selected 10 one-day matches: Watson: 42 32 40 45 17 83 59 64 76 72 Morris: 95 3 28 50 31 14 82 0 59 108 A prize is given to the best player. **Compute** average run of these each players of 10 one-day matches. Also, **Compare** that who is more consistent player in making runs by using relative measures of dispersion?	[7]	CLO3 Level-4

Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2024
Course Code: SE222 ; Course Title: Computer Architecture
Sections & Teachers: FBR, KBB, NJM, SS, SUP

Time: 1 Hour 30 Mins   Marks: 25

Answer ALL Questions
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

			[Marks-5]	
1.	a)	A 400-MHz processor was used to execute a benchmark program with the following instruction mix and clock cycle counts.		

Instruction Type	CPI	Instruction Mix
Arithmetic and Logic	1	60%
Load/Store with cache hit	2	18%
Branch	4	12%
Memory reference with the cache miss	8	10%

Identify the effective CPI, MIPS rate from the table to execute program delivery.

b)	**[Marks-5]**

Assume that your processor is working with 6 I/O devices which are a keyboard, a portable disk, a pen drive, a headphone, a mouse, an audio system and a DVD - ROM with the priorities of 1, 2, 3, 4, 5, 6 and 7 in sequence. **Label** the multiple interrupt handling with proper diagrams using the following cases.

CLO-1
Level-1

Cases:
i. Processor first received a signal from pen drive at time t=13 unit
ii. Then received another signal from the headphone at time t=14 unit
iii. After that received the 3rd signal from the mouse at time t= 15 units.
iv. Next Processor received the 4th signal from the portable disk at time t= 16 units.
v. After the processor received the 5th signal from the audio at time = 17 units.
vi. Next processor received the 6th signal from the keyboard at time = 19 unit
vii. Finally, processor received the last signal from the DVD - ROM at time = 21 unit

NB: Each task is continuous and can only be finished after handling the interrupts according to their respective priorities.

| | c) | **Find** the Hypothetical Processor Instructions from the generated figure. | [Marks-5] | |

c) Find the Hypothetical Processor Instructions from the generated figure. [Marks-5]

Memory

		Here,
400	13501	
401	23502	0001 = Load AC from memory
402	63503	0010 = Add to AC from memory
403	53503	0100 = Multiply to AC from memory
404	43503	0101 = Store AC to memory
		0110 = Divide to AC from memory
3501	005	
3502	003	
3503	002	

2.	a)	Classify and briefly **derive** the main structural components of a GP processor	[Marks-4]	
	b)	Demonstrate the logical and physical cache diagram with explanations.	[Marks-3]	CLO-2 Level-3
	c)	Show the diagram of a typical Cache Read Operation.	[Marks-3]	

Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Midterm Exam Examination, Spring 2024

Course Code: SE 131 , Course Title: Data Structure

Level: 1   Term: 3   Section: A, B, C, D, E, F, G, H, I

Instructor: AB-A,B,E, RMS-C,D, MHS-F, SI-G,H,I   Modality: Physical

Date: March 23, 2024   Time: 11:15 AM – 12:45 PM

Marks: 25

One and a half hours (1:30)

Directions:
- Students need to go through the CASE STUDY shown in this exam paper.
- Analyze and answer specific section based on your own thinking and work. Answer questions serially.

1. A. Suppose you want to find how many vowels and consonants are present in "Daffodil International University". Describe the type of operation you need to perform to find total number of vowel and consonant in the given name? *[CLO-1, Level-2] [Marks-2]*

   B. Suppose you have declared one array type variable, **explain** the concept of memory allocation. *[CLO-1, Level-2] [Marks-2]*

2. **Scenario 1:** In the 3rd semester you have 6 different courses. Out of 100 you have got 76 in MAT102, 65 in SE131, 74 in SE132, 85 in SE133, 71 in SE212, 79 in STA101 course. Consider each mark as an element of an array. After considering the elements your array will look like "76", "65", "74", "85", "71", "79". You have to work with this numbers.

   A. As the above mentioned array is not sorted and you need to sort all the elements in ascending order by applying bubble sort algorithm. **Calculate** the Complexity of Bubble sort algorithm. *[CLO-2, Level-3] [Marks-2]*

   B. If you need to apply linear search and binary search both for the data given above to find out '79', **explain** which one will perform good and why? *[CLO-2, Level-3] [Marks-2]*

3. **Scenario 2:** If there exists one array with 20 elements. The elements are a, b, c, d, e, f, g, h, I, j, k l, m, n, o, p, q, r, s, t. *[CLO-3, Level-3] [Marks-6]*

   a. If you need to search "p", **Apply** Binary Search to find out it.
   b. If you need to do sort all the data in descending order, **illustrate** the basic part of the code to do the operation.
   c. If you need to delete one element like: "c", **illustrate** down the basic part of the code to do the operation.

4. A. Suppose you have been given the following linked list. Each node contains a data and a pointer / memory address to next node. There is no additional memory space available in the memory. If the start node is: 5076, then- *[CLO-3, Level-3] [Total Marks-11]*

Memory Address: 1050		Memory Address: 674		Memory Address: 1280		Memory Address: 5076	
Data: 5	Next: 5076	Data: 75	Next: Null	Data: 76	Next: 674	Data: 15	Next: 1280

   i. **Construct** the linked list and available linked list. [Sub marks 3]
   ii. **Show** pseudo code/Basic part of the code for the linked list Node construction and data assign. [Sub marks 3]
   iii. If you need to insert one new data in the linked list, **investigate** what will happen? [Sub marks 1]
   iv. If you are asked to delete "76", from the linked list, **investigate** what will happen? [Sub marks 1]

   B. **Build** the pseudo code (or main part of the code) of pop function of a Stack data structure. Make sure that the function does not crash the program when popping from an empty stack. [Sub marks 3]

Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2024
Course Code: SE211; Course Title: Object Oriented Concepts
Sections: All, Teachers: RJM, NT, SD

Time: 1 Hour 30 Mins   Marks: 25

Answer ALL Questions
Please read all the following questions carefully. Understanding of questions is also a part of the examination. Best Of Luck!

1.	a)	Explain Compile-time and run-time polymorphism with an example of each.	3	CLO-1 Level-2
	b)	Convert the below UML Diagram into a Java Code. Create two objects and then implement all the methods and display the outputs.	7	

```
                    Employee

              +name: String
              +id: int
              +salary: double
              +team: String

  +empInfo(name:String, id:int, salary:double, team:String) : void
              +showInfo():void
```

extends

```
                    Admin

              -designation: String

            +Admin(designation:String)
                  +Admin()
            +main(String[]args):void
```

2.	a)	Monitor the given code below to write Car class(Design class) to get the output as shown. Hints: Remember, the constructor is a special method. Here, you have to deal with constructor overloading and method overloading.	6	CLO-2 Level-4

// Write your code here:

Main Method:
```java
public static void main(String[] args) {
    Car car1 = new Car();
    Car car2 = new Car("Toyota", "Camry");
    car1.displayInfo();
    car2.displayInfo();
    car1.accelerate(20);
```

```
        car2.accelerate(15);
        car1.brake(10);
        car2.brake(25);
        car1.displayInfo();
        car2.displayInfo();
        car1.accelerate(30, 2);
        car2.accelerate(25, 3);
    }}
```

Output:
Car: Unknown Unknown
Car: Toyota Camry
Accelerating... Speed is now: 20 mph
Accelerating... Speed is now: 15 mph
Braking... Speed is now: 10 mph
Braking... Car has stopped.
Car: Unknown Unknown
Car: Toyota Camry
Accelerating... Speed is now: 30 mph
Accelerating for 2 seconds... Speed is now: 32 mph

b)	Classify all types of Variables with an example.	3
c)	Animal pet1 = new Dog(); Identify the type of the object 'pet1' in this above statement?	1
d)	Figure out the output of the following code.	5

```
public class JigSaw, {
    int instance = 5;
    static int check = 12;

    public void puzzle1() {
        int rubics = 100;
        check = 15;
        System.out.println(rubics);
        System.out.println(instance);
        System.out.println(check);
}}

public class Sudoku extends JigSaw {
    public void puzzle2() {
        int rubics = 200;
        instance = 9;
        System.out.println(rubics);
        System.out.println(instance);
        System.out.println(check);
        instance += 2;
    }}
```

```
public class Chess extends Sudoku {
    public void puzzle2() {
        super.puzzle2();
        int rubics = 300;
        System.out.println(rubics);
        System.out.println(instance);
        System.out.println(check);
        instance += 2;
    }
    public static void main(String[] args) {
        Chess solve1 = new Chess();
        Chess solve2 = new Chess();
        solve1.puzzle1();
        solve2.puzzle2();
        System.out.println("Instance value after
puzzle2: " + solve1.instance);
    }}
```

Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Mid Examination, Spring- 2024
Course Code: BNS 101   Course Title: Bangladesh Studies
Batch & Sections: 40-All Teachers: UF, AH, AA

Time: 1.5 Hours   Marks: 25

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially]

1.	Extend how the impacts of western cultures reflect the evolving nature of Bangladeshi culture in the era of globalization.	05	CLO-1 *Level-2*
2.	Clarify the development of the identity of the people of Bangladesh with Bangla Language as a mixed-blood nation and fusion of cultural diversity.	05	CLO-1 *Level-2*
3.	Explain the efficacy of foreign policy in enhancing the software engineering sector of Bangladesh on the international stage using the resolution of existing obstacles.	10	CLO-2 *Level-4*
4.	Distinguish the limitations of the Bangladesh constitution by addressing the fundamental state policy with some other provisional conflicts to set out the democratic rights of the people.	05	CLO-1 *Level-2*