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Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Summer 2025

Course Code: SE 312; Course Title: Software Quality Assurance & Testing

Teachers & Sections: MNA, KMH, CP, FF, RRB, MTM (40A - 40I)

Time: 2:00 Hrs **Marks: 40**

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.

```
#include <stdio.h>
int main() {
    int number, i = 1, sum = 0, result = 1;
    printf("Enter a positive integer: ");
    scanf("%d", &number);
    if (number > 0) {
        printf("Input is valid.\n");
        while (i <= number) {
            printf("Current number: %d\n", i);
            if (i % 2 == 0) {
                sum += i;
                printf("Added %d to sum.\n", i);
            }
            i++;
        }
        printf("Sum of even numbers from 1 to %d is: %d\n", number, sum);
    }
    else {
        printf("You entered a negative number!\n");
        printf(".......Performing a different calculation...\n");
        while (i>=number) {
            printf("Current number: %d\n", number);
            number = -number;
            if (number!= 0) {
                printf("Now Current Number : %d\n", number);
            }
            else{
            printf ("You choose Zero!");
            }
        }
    printf("Program ended.\n");
    return 0;
    }
```

a)	Inspect the above code and **Draw** Control Flow Graph (CFG).	[Marks-5]	CLO-3 Level-3
b)	**Calculate** Cyclomatic Complexity of the program.	[Marks-5]	
c)	**Prepare** the list of independent paths that are required to cover the CFG.	[Marks-5]	
d)	**Generate** Test cases according to the independent paths for the above program.	[Marks-5]	
2.	A software company is developing an online ticket booking system. During the testing phase, several defects were reported, tracked, fixed, and re-tested before final deployment. **Illustrate** and explain the Bug Life Cycle with a proper diagram.	[Marks-5]	CLO-4 Level-3

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3.	Your team is currently testing a newly developed Budgeting Module, which consists of 2500 lines of code (2.5 KLOC). During the initial testing phase, your QA team identified 120 defects in the module. Over a period of 38 business days, the development team managed to resolve 100 of these defects. However, upon re-testing, 25 of the resolved defects were still found to be problematic and required further attention. Out of those, 15 defects were rejected by the testers due to improper fixes or incomplete resolution. In the second phase, over the next 22 business days, the developers resolved 20 out of the remaining defects. After re-testing in the third phase, 10 of these defects were once again found to be problematic and subsequently rejected by the testing team. Now, **Calculate** and present the formulas for the following i. Defect Density ii. Defect Removal Rate iii. Turn Around Time (TAT) iv. Defect Rejection Rate	[Marks-4]	CLO-4 Level-3

4.

```
#include <stdio.h>
int main(){
    int m = 23, n = 19, o = 14, s = 0;
    printf("Entered numbers are: m = %d ; n = %d ; o = %d \n", m,n,o);
    if (m > n && n > o || m == o){
        s = m + n - o;
        printf("Sum = %d \n", s);
    }
    else{
        s = m + n + o;
        printf("Sum = %d \n", s);
        }
    return 0;
}
```

a)	**Derive** test cases for the above code using Condition Coverage technique and validate that it does not give a guarantee about full coverage.	[Marks-5]	CLO-4 Level-3
b)	**Apply** different Mutations for the above code segment by designing Test cases.	[Marks-6]	