National University of Computer and Emerging Sciences, Lahore Campus

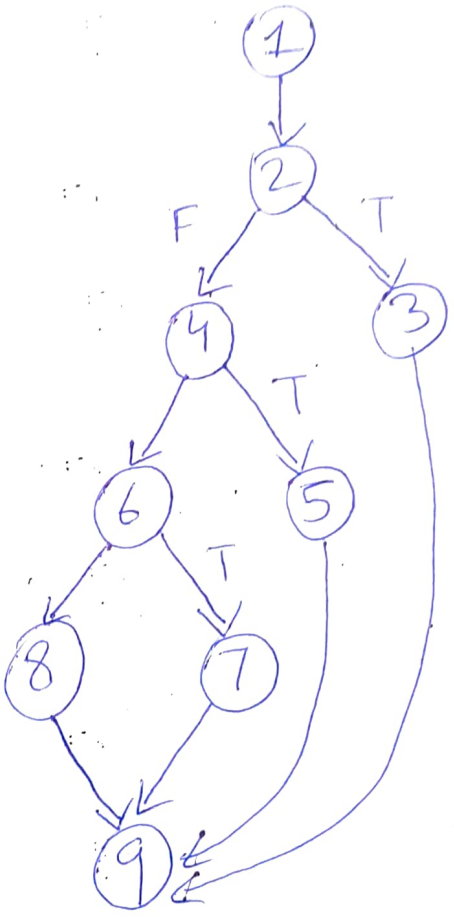
Course:	Software Engineering	Course Code:	CS-3009
Program:	BS (Computer Science)	Semester:	Spring 2023
Duration:	20 Minutes	Total Marks:	20
Quiz Date:	3-May-23	Roll No.	
Section:	6E	Name:	

Question 1: (20 Marks)

For the piece of code provided below:

```
1) def max_of_three(a, b, c):
2)     if a > b and a > c:
3)         max_num = a
4)     else if b > a and b > c:
5)         max_num = b
6)     else if c > a and c > b:
7)         max_num = c
8)     else: max_num = NULL
9)     return max_num
```

a) Make a Control Flow Graph (CFG).



b) Provide a test suite that gives 100% branch coverage.

1) $(a, b, c) \rightarrow (3, 2, 1) \rightarrow$ a is largest

Branch Coverage $= \frac{1}{6} \times 100 = 16\%$

2) $(a, b, c) \rightarrow (1, 5, 2) \rightarrow$ b is largest

$\frac{3}{6} \times 100 = 50\%$

3) $(a, b, c) \rightarrow (1, 2, 8) \rightarrow$ c is largest

$\frac{5}{6} \times 100 = 83\%$

4) $(a, b, c) = (1, 1, 4) \rightarrow$ Any two or all variables are equal

$\frac{6}{6} \times 100 = 100\%$

c) How many independent paths exist? Mention all the independent paths.

Independant Paths $= E - N + 2$

$= 11 - 9 + 2$

$= 4$

1) $1 \rightarrow 2 \rightarrow 3 \rightarrow 9$

2) $1 \rightarrow 2 \rightarrow 4 \rightarrow 5 \rightarrow 9$

3) $1 \rightarrow 2 \rightarrow 4 \rightarrow 6 \rightarrow 7 \rightarrow 9$

4) $1 \rightarrow 2 \rightarrow 4 \rightarrow 6 \rightarrow 8 \rightarrow 9$