(3 Hours) **[Total Marks : 80]**

Note : Question No. 1 is compulsory.
Attempt Any Three from remaining questions.
Assume suitable data if required.

Q1

A. Explain the need of automation in testing ? Differentiate between manual testing and Automated Testing **10**

B. What are Key elements of Test Management ? Explain the structure of testing group. **10**

Q2 A. Classify different types of bugs based on Software development lifecycle **10**

B. A program reads three numbers, *A*, *B*, and *C*, with a range [1, 50] and prints the largest number. Design test cases for this program using equivalence class testing technique. **10**

Q3 A. Discuss verification and validation activities. **10**

B. What is Mutation Testing ? Explain Mutation Testing Process **10**

Q4 A . Consider the program for calculating the factorial of a number. **10**

(a) Draw the DD graph for the program.

(b) Calculate the individual cyclomatic complexity number for main() and fact() and then,

the cyclomatic complexity for the whole program.

```
main()
{
int number;
int fact();
1. clrscr();
2. printf("Enter the number whose factorial is to be found out");
3. scanf("%d", &number);
4. if(number <0)
5. printf("Facorial cannot be defi ned for this number);
6. else
7. printf("Factorial is %d", fact(number));
8. }
int fact(int number)
{
int index;
1. int product =1;
2. for(index=1; index<=number; index++)
3. product = product * index;
4. return(product);
5. }
```

B. What is Test Plan ? Explain Different components of Test plan document. **10**

Q5 A. Explain challenges in Agile Testing **10**

B. Comment on regression testing process. **10**

Q6.

Write Short Note on following **20**

A. Test point analysis

B. Unit testing and Integration testing

C. Bug Lifecycle

D. McCall's Quality Factors and Criteria
