(Time: 3 Hours) **Total Marks:80**

Note: 1) Question no. 1 is compulsory.

2) Solve any three out of remaining five questions.

3) Assume suitable data wherever necessary.

Q.1 . a) Define software testing. Explain software testing model with a neat diagram. (05)

b) Classify bugs based on SDLC. (05)

c) Is white-box testing really necessary? Give reasons. (05)

d) "Regression testing produces quality software". Justify with reasons. (05)

Q.2. a) What are the features of V-testing model? Explain in detail. (10)

b)Which type of testing is possible with equivalence class partitioning? (10)

A program takes an angle as input within the range [0,360] and determines in which quadrant the angle lies. Design test cases using equivalence class partitioning method.

Q.3. a) Consider the following program for calculating the factorial of a number. It consists of main( ) program and the module fact( ). Calculate the individual cyclomatic complexity number for main( ) and fact( ) and then the cyclomatic complexity for the whole program. Draw DD graph. List all independent paths and design test cases from independent paths.

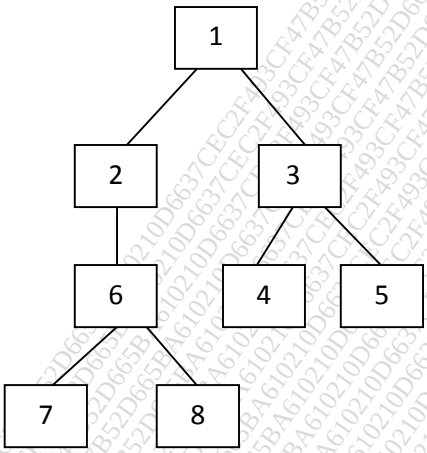
```
main()
 {
  int number;
  int fact();
  clrscr();
  printf("enter the number whose factorial is to be found out");
  scanf("%d", & number);
  if (number < 0)
     printf("factorial cannot be defined for this number");
  else
     printf("factorial is %d", fact(number));
 }


int fact( int number )
{
  int index;
  int product=1;
  for ( index=1; index<=number; index++)
```

```
        product=product*index;
    return(product);
}
```

b) Describe types of static testing in detail. (10)

Q.4. a) Why do we need integration testing? (10)

Perform top-down and bottom-up integration procedure from the following system hierarchy.



b) What is the need for software measurement? Discuss various types of software metrics. (10)

Q.5.a) What are the components of a test plan. Illustrate test plan hierarchy with a neat diagram. (10)

b) Describe the procedure for Test Point Analysis (TPA) with a neat diagram. (10)

Q.6. Write a short on any two. (20)

a) Software Quality Measurement.
b) Object Oriented Software testing.
c) Web based system testing.