(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++)
```

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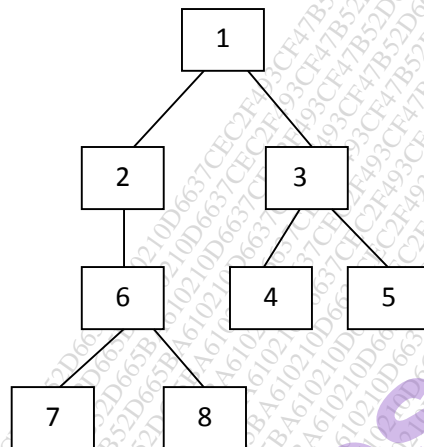
```
            product=product*index;
          return(product);
      }
```

   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.

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