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MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104



FIFTH SEMESTER B.E. (CSE) DEGREE END SEMESTER EXAMINATION
NOVEMBER 2011
SOFTWARE ENGINEERING (CSE 303)
DATE: 30-11-2011

TIME: 3 HOURS

MAX.MARKS: 50

Instructions to Candidates

- Answer **any five** full questions.
- Answer should be clear and concise in point form.
- Missing data if any can be suitably assumed.

- 1A. Explain the Spiral Model with a neat diagram (4 Marks)
- 1B. Why should you document a Life Cycle Model? Elaborate. (2 Marks)
- 1C. Which life cycle model would you follow for developing software for each of the following applications? Mention the reasons justifying your choice of a particular life cycle model.
 - i) A new text editor.
 - ii) An object oriented software development effort. (2+2)Marks
- 2A. Give the IEEE definitions of Software and Software Engineering (2 Marks)
- 2B. Draw the Computer system engineering life cycle and explain it. (3 Marks)
- 2C. Give the data definition operators used in DFDs, along with their meaning and example for each. (3 Marks)
- 2D. With diagrams explain synchronous and asynchronous operation of two bubbles in DFDs (2Marks)
- 3A. List the different CMM levels, the focus for each level and the corresponding key process areas for each level in the form of a table. (4Marks)
- 3B. Discuss the classification of various types of failures used when estimating the reliability of a software product. (3 Marks)
- 3C. Explain the various quality factors associated with the quality of a software product. (3 Marks)

- 4A. Algebraically specify an abstract data type that stores a set of elements and supports the following operations. Assume that the ADT element has already been specified and you can use it:
- i. **new**: creates a null set.
 - ii. **add**: takes a set and an element and returns the set with the additional element stored.
 - iii. **size**: takes a set as argument and returns the number of elements in the set.
 - iv. **remove**: takes a set and an element as its argument and returns the set with the element removed.
 - v. **contains**: takes a set and an element as its argument and returns the boolean value true if the element belongs to the set and returns false if the element does not belong to the set.
 - vi. **equals**: takes two sets as arguments and returns true if they contain identical elements and returns false otherwise.
- (6Marks)
- 4B. List and explain the basic building blocks which are used to design the structure chart. (3 Marks)
- 4C. What is an afferent branch? (1 Mark)
- 5A. Consider the following C function named Sort.
- ```

/*sort takes an integer array and sorts it in ascending
order*/
void Sort(int a[], int n)
{
 int i,j;
 for(i=0;i<n;i++)
 for(j=i+1;j<n;j++)
 if(a[i]>a[j])
 {
 int Temp=a[i];
 a[i]=a[j];
 a[j]=Temp;
 }
}

```
- a) Determine the cyclomatic complexity of the sort function.
- b) Design a test suite for the function Sort using the following white-box testing strategies
- i] Statement coverage
  - ii] Branch coverage
  - iii] Condition coverage
  - iv] Path Coverage
- (10Marks)

- 6A. Using the table given below, draw activity diagram. Compute the earliest start time, latest start time and slack time of each activity. Also, Identify the critical path. (7 Marks)

| Activities | Duration | Dependencies |
|------------|----------|--------------|
| A          | 7        | -            |
| B          | 3        | -            |
| C          | 6        | A            |
| D          | 3        | B            |
| E          | 3        | D,F          |
| F          | 2        | B            |
| G          | 3        | C            |
| H          | 2        | E,G          |

- 6B. Explain different Team Structures. (3Marks)

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