



SIXTH SEMESTER EXAMINATION-2010

SOFTWARE ENGINEERING

[IT 601 / (K)CS 611]

Full Marks: 70

Time: 3 Hours

Answer any SIX questions including Question No.1 which is compulsory.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. i) Why spiral model is considered as a Meta model? [2 × 10]
Justify.
- ii) Identify and explain four shortcomings of LOC.
- iii) What problem would a software development organization face if it does not have a documented process model? Justify your answer.
- iv) Identify and explain briefly the three different category of software as proposed by Boehm in COCOMO. What they signify? Explain.
- v) Explain the concepts of modularity and layered design of modules used in software design with schematic diagram.
- vi) What is stub and driver? How they contribute in unit testing? Explain.
- vii) How integration testing is done through "Big bang approach"? Write the names of other approaches used for integration testing?
- viii) Identify the three ISO 9000 series of standards and write down for which type of companies each of them applied.

(1)

- ix) Why the SRS document is called a black box specification of a system? Justify.
- x) "In an Examination a candidate has to score minimum of 23 marks in order to clear the examination. The maximum that he can score is 40 marks". Design the equivalence class test cases for the above problems.
2. a) Suggest a suitable life cycle model for a software project which your organization has undertaken on behalf of a certain customer whose requirements are not properly understood in the beginning and is rich with graphical user interface? Justify your answer and explain all phases of the proposed model in detail with schematic diagram. [6]
- b) Why software engineering is called a layered technology? Explain briefly. [4]
3. A restaurant owner wants to computerize his order processing, billing and counting activities with the support of following requirements:
- Whenever ingredients are issued for preparation of food items, the data is to be entered to the computer and then issue is done from the inventory.
- The system handles the purchase orders which are to be generated on daily basis, whenever the stock of any ingredients (inventory) falls below a threshold values and this is done with respect to a command given by the manager.
- Whenever the ordered ingredients arrive, the invoice data regarding the quantity and price are entered in the inventory. If sufficient cash balance is available, then computer should print cheques immediately against the invoice. The expenses information is stored in a expenses file.

The software should also handle the sales by accepting sales data and store in a sales report file and generate the bills.

The restaurant owner also expects the computer to generate statistical report about sales of different items, expenses with response a request.

Answer the following questions:

- a) Identify all functional requirements along with their inputs and outputs. Also write briefly the processing required for each of the functionality. [4]
- b) Draw the context diagram and 1 level DFD. [4]
- c) Draw the structure chart. [2]
4. a) What can be estimated using COCOMO basic model and how? Write the factors highlighted in intermediate COCOMO? What are lacking in basic and intermediate COCOMO? [6]
- b) Suppose that a certain software product for business application costs Rs 50,000/- to buy off-the-shelf and that its size is 40 KLOC. Assuming that in-house developers cost Rs 6000 per programmer-month (including overheads). Would it be more cost effective to buy the product or to build it? Justify. [4]
5. a) Consider the following find_maximum function and answer the given questions: [6]

```
int find_maximum(int i,int j,int k){  
    int max;  
    if(i>j) then  
        if(i>k) then  
            max=i;  
        else max=k;  
    else if(j>k)
```



```

        max=j;
        else max=k;
        return(max);
    }

```

- (i) Draw the CFG of the following function and then determine the Cyclomatic complexity.
- (ii) Generate the test cases for statement coverage.
- b) What is mutation testing? How this testing takes place? Explain. [4]
6. a) Explain briefly the evolution of software quality system. [6]
 b) Identify at least four different factors used for defining software quality and briefly explain each of them with justifications. [4]
7. a) What is software reverse engineering? When can one need it? What cosmetic changes one need to carry out before it? Discuss. [6]
 b) Briefly explain the different types of software maintenance and justify why more effort is required for this phase of any software life cycle? [4]
8. Write short notes on the following: [5 × 2]
 a) RAD approach for software development.
 b) Software organization structure

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