Code: CS44   **Subject: SOFTWARE ENGINEERING**

ALCCS – OLD SCHEME

Time: 3 Hours   **FEBRUARY 2012**   **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE:
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**
- **All calculations should be up to three places of decimals.**

Q.1 a. Mention four basic characteristics that differentiate a simple program from a software product.

b. Explain the shortcomings of the classical waterfall model.

c. What is meant by a CASE tool? Identify the primary reasons for using a CASE tool.

d. Draw Control Flow graph for the following lines of codes computing gcd for two numbers.

```
int compute_gcd(int x, int y){
    while (x != y){
        if(x > y) then
            x = x–y;
        else y = y – x;
    }
    return x;
}
```
Also compute the cyclomatic complexity.

e. Explain how structure charts are different from flow charts?

f. Verify the statement "The primary characteristic of a good design is low cohesion and high coupling".

g. Differentiate between Software Correctness, Software Robustness and Software Reliability.   **(7 × 4)**

Q.2 a. Explain Spiral Model with the help of a suitable diagram. State the activities carried out during each phase of a spiral model. Identify circumstances under which spiral model should be used for software development.   **(10)**

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b. Mention the problems faced while developing a large software product without using software engineering principles. **(4)**

c. Discuss Decision Tables as a software specification tool. **(4)**

Q.3 a. Discuss the different types of views of a system captured by UML diagrams. **(5)**

b. Mention the shortcomings of a Data Flow Diagram. **(5)**

c. Explain differences between function-oriented and object-oriented design approach giving suitable examples. **(8)**

Q.4 a. What is a coding standard? Write down five important coding standards. Identify the problems that might occur if the engineers of an organization do not adhere to any coding standard. **(6)**

b. What is meant by a Code review? Why is it required to be completed before performing integration and system testing? Discuss two approaches used for Code Review. **(6)**

c. Discuss the steps involved in Software Re-engineering. **(6)**

Q.5 a. Discuss how reliability changes over the life time of a software product. Why is it difficult to measure the reliability of a software product? **(6)**

b. What is meant by Heuristic Estimation Techniques? Write down the differences among organic, semidetached and embedded software product in the context of COCOMO model. **(6)**

c. Mention the major shortcomings of Lines of Code (LOC) metric as a software size oriented metric. How Function points metrics addresses the shortcomings of LOC metric. **(6)**

Q.6 a. Write down basic differences between object-oriented analysis (OOA) and object-oriented design (OOD) technique. Identify at least five important features that characterize a good object-oriented design. **(10)**

b. Discuss the different characteristics of a good SRS document. What are the components of an SRS document? **(8)**

Q.7 Write short notes on any **THREE** of the following:-

(i)   Software Testing Techniques and Strategies.
(ii)   Software Debugging.
(iii) CASE Tools, Workbench and Environment.

(iv) PERT and CPM.   **(6+6+6)**