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.

```c
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.

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.
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)