

Roll No. .... Total Pages : 05  
**020604**

**May 2024**

**B.Tech. (RAI) (Sixth Semester)**

**Software Engineering (PEC-RAI-601-21)**

*Time : 3 Hours] [Maximum Marks : 75*

**Note :** It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

#### **Part A**

1. (a) What is SRS ? Explain its importance. 1.5
- (b) Differentiate between Personal Software Process and Team Software Process. 1.5
- (c) Discuss the advantages of using Function Point Analysis over Lines of Code for software estimation. 1.5
- (d) Explain the concept of modularization in system design. 1.5
- (e) Differentiate between Cohesion and Coupling. 1.5

- (f) A software project has 5000 lines of code. If the productivity rate is 10 lines of code per person-hour, calculate the total effort required to develop the software. **1.5**
- (g) Differentiate between Data Design, Architecture Design and Interface Design. **1.5**
- (h) Consider a program to determine whether a number is odd or even and print a message  
Number is even

*Or*

- Number is odd.  
The number may be any valid integer. Design boundary value test cases. **1.5**

- (i) Elaborate various SQA Activities. **1.5**
- (j) Differentiate between reverse engineering and forward engineering. **1.5**

## Part B

2. (a) Explain the concept of "Software Development Life Cycle" (SDLC) and its stages. Also discuss Spiral Model with its advantages and disadvantages. **10**

- (b) Briefly discuss the concept of "Agile Development." Highlight at least two key principles of the Agile Manifesto. **5**
3. (a) Suppose that a Basic project was estimated to be 400 KLOC (kilo lines of code). Calculate effort and time for each of the three modes of development in COCOMO. All the constants value provided in the following table : **10**

Mode	A	b	c	d
Organic	2.4	1.05	2.5	0.38
Semi-detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

- (b) Discuss Risk Analysis and Management. **5**
4. (a) Explain the concept of "Software Requirements" and why it is crucial in the software development process. Provide an example of both functional and non-functional requirements. **10**
- (b) Why Software Planning is essential in the software development life-cycle ? **5**

5. (a) Differentiate between Functional Modeling and Behavioral Modeling. 5

(b) Describe the key activities involved in the System Design phase of the software development life-cycle. How does it differ from system modeling ? 10

6. (a) Explain various debugging approaches. 5

(b) Consider the program to find the greatest number : 10

```
#include<stdio.h>
main()
{
    float x,y,z;
    clrscr();
    printf("enter the three variables x,y & z");
    scanf("%f %f %f", &x,&y,&z);
    if(x>y)
    {
        if(x>z)
            printf("x is greatest");
        else
            printf("z is greatest");
    }
}
```

```
else
{
    if(y>z)
        printf("y is greatest");
    else
        printf("z is greatest");
}
getch();
```

- (a) Draw the DD graph for the program.  
(b) Calculate the cyclomatic complexity of the program using all methods.  
(c) List all independent paths.  
(d) Design all test cases from these independents paths.

7. (a) Why Software Quality Assurance is important ? Explain CMM. 10  
(b) Discuss Clean Room software engineering with example. 5