Roll No. | | | | | | | |

H

# TCS–603/TIT–603

## B. Tech. (CS/IT) (Sixth Semester)
## End Semester EXAMINATION, 2017
### SOFTWARE ENGINEERING

*Time : Three Hours* ] [ *Maximum Marks : 100*

**Note :** (i) This question paper contains *five* questions.

(ii) All questions are compulsory.

(iii) Instructions on how to attempt a question are mentioned against it.

(iv) Total marks assigned to each question are **twenty**.

1. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

   (a) Describe the concept of Halstead's software science. For the following C program estimate the Halstead's length and volume measures :

```
void main ( )
{
```

```
float x, y, z, avg;
scanf("%f%f%f",&x,&y,&z);
avg = (a+b+c)/3.0;
printf ("average of numbers = %f",avg);
}
```

(b) What did Fred Brooks mean by the terms accidental and essential complexity ? When was the last time, we had a significant improvement on the essential complexity front in the software industry ?

(c) Describe coding guidelines with respect to control structures.

2. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Why is cyclomatic complexity used ? Draw a control flow graph for the program given below :

```
i = 0;
n = 4;//N-Number of nodes present in the graph
while (i<n –1) do
j = i +1;
while (j<n) do
if A[i]<A[j] then
swap (A[i], A[j]);
end do;
i=i+1;
end do;
```





find cyclomatic complexity based on CFG of the above mentioned code section. Assume there is no error in the program.

(b) Discuss all levels of the CMM-I model in detail, explaining in generic terms the implications of an organization being a certain level.

(c) What are the different types of maintenance that a software product might need ? Why are these maintenance required ?

3. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) Describe function based metrics for measuring the functionality delivered by a system. Consider a project with the following functional unit :

Number of user input = 10
Number of user output = 800
Number of inquiries by user = 70
Number of user files = 12
Number of external interface = 08

Assume all complexity adjustment factors and weighting factor are average, compute the function point for the project.

(b) Describe the following terms :

(i) Unit testing and integration testing

(ii) Difference between integration testing and system integration testing

(c) Discuss the utility of regression testing in the industry. Considering, that it is regular in the industry, what techniques can be applied in order to make it more effective and comprehensive ?

4. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) In a scenario where you are a job aspirant as a developer in a reputed software firm, you encounter a major MNC hiring for the role of a software tester at a you campus. You face the question. "Why testing and not development ?" In such a scenario, explain in detail all possible arguments to convince the interviewer that being hired as a tester offers you more opportunities on the technical and financial front.

(b) Write short notes on the following :

(i) Agile testing

(ii) Reverse Engineering

(iii) Automation test cases

(iv) Boundary value analysis

(c) Discuss the salient points of design engineering in detail. Also differentiate between top-down and bottom-up approach.





5. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) "The requirement traceability matrix is an important tool in adjudging the completeness of the requirement list." Justify this statement. Clarify whether or not the RTM is an evolutionary artifact, stating the reasons alongside.

(b) Considering you are in the integration testing phase for a newly developed payment Banking Application, design three highly detailed test cases, covering the testing for some core functionality. The cases should be in a proper format, with a unique test case ID assigned to each of them.

(c) Explain in detail the spiral model for software development with a neat and precise diagram.