H Roll No. .....

TCS/TIT–302

B. TECH. (CS/IT) (THIRD SEMESTER) END SEMESTER EXAMINATION, 2018

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) Write your comments on the following statements :

(i) "Software does not wear out".

(ii) "There is no silver bullet for Software Development."

(b) What do you understand by Agile Software Development Model ? Discuss any *five* principles of Agile Software Development Model.

(c) This process model focuses highly on risk analysis and prevention. Name the model and explain its different phases. Support your answer with a neatly labelled diagram.

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

(a) Explain the importance of requirements. How many types of requirements are possible and why ?

(b) What are components of a use-case diagram ? Draw a use-case diagram of railway reservation system.

(c) What is the difference between Level-0 and Level-1DFD ? Draw a DFD for result preparation automation system of B. Tech. courses of your university. Clearly also mention all assumptions made by you.

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

(a) Discuss the objectives of software design. Describe the difference between conceptual design and technical design.

(b) What do you mean by the terms cohesion and coupling with respect to software design ? Elaborate the statement "A good software design has least degree of coupling and high degree of cohesion."

(c) Write short notes on the following :

(i) Function point counts on five parameters. Name them.

(ii) Top Down Approach and Bottom Up Approach in programming.

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

(a) Define software metrics. Why do we really need metrics in software ? Which one is the most appropriate size estimation technique and why ?

(b) For a program with number of unique operators $n_1 = 20$ and $n_2 = 40$ number of unique operands, compute the following :

(i) Program volume

(ii) Effort and time

(iii) Program length

(iv) Program level

(c) Consider the following C function :

```
Void sort (int a[ ], int n)
{
  int i, j;
  for (i = 0; i < n – 1; i + +)
   for(j j+ 1; j <n; j ++)
   if(a[i]>a[j])
   {
  temp = a [i];
  a[i] =a [j];
  a[j]= temp;
  }
}
```

(i) Determine the cyclomatic complexity of the sort function.

(ii) Design a test suite for the function sort using the following white box testing strategy :

(1) Statement Coverage

(2) Condition Coverage.

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

(a) What is software testing ? Differentiate between Black-box Testing and White-box Testing.

(b) Briefly discuss the following :

(i) Test case design, Test and Test suite

(ii) Verification and Validation

(iii) Alpha, beta and acceptance testing

(c) Why do we need maintenance for project while the entire project is built before ? What are the categories of maintenance in software development ?