**National Institute of Technology**
**Kurukshetra-136119**
**End Semester Examination**

**Date of the Examination: 30-11-2021** | **Programme: B. Tech**
**Semester: 3rd** | **Subject: Software Engineering**
**Course No.: ITPC 27** | **Maximum Marks: 50**
**Time allowed: 2 Hours** | **Total No. of Question:05**
**Total No. of Pages used: 03**

*This Paper contains 2 sections (Section I and Section II) and both are compulsory. Section I is objective in nature and contains multiple choice questions carrying 1 mark each. Section II is subjective with 4 Compulsory Questions having 1 choice in question no. 4. Marks of each question has been assigned against the question itself.*

**SECTION I** **10 M**

*Q1. This section carries multiple choice questions 1 marks each and all questions are compulsory.*

I) Estimation of software development effort for organic software is COCOMO is

(a) E=2.4(KLOC)1.05PM (b) E=3.4(KLOC)1.06PM

(c) E=2.0(KLOC)1.05PM (d) E-2.4(KLOC)1.07PM

II) Function point analysis (FPA) method decomposes the system into functional units. The total number of functional units are

(a) 2 (b) 5

(c) 4 (d) 1

III) The extent to which different modules are dependent upon each other is called

(a) Coupling (b) Cohesion

(c) Modularity (d) Stability

IV) The worst type of cohesion is

(a) Temporal cohesion (b) Coincidental cohesion

(c) Logical cohesion (d) Sequential cohesion

V) The outcome of construction phased can be treated as:

(a) Product release (b) Beta release

(c) Alpha release (d) All of the above

VI) In COCOMO model, if project size is typically 2-50 KLOC, then which mode is to be selected?

(a) Organic (b) Semidetached

(c) Embedded (d) None of the above

VII) Which one is the international standard for size measure?

(a) LOC (b) Function count

(c) Program length (d) None of the above

VIII) Minimal implementation of any algorithm was given the following name by Halstead:

(a) Volume (b) Potential volume

(c) Effective volume (d) None of the above

IX) KPA in CMM stands for

(a) Key Process Area (b) Key Product Area

(c) Key Principle Area (d) Key Performance Area

X) Which one is not a level in Boehm software quality model ?

(a) Primary uses (b) Intermediate constructs

(c) Primitive constructs (d) Final constructs

**Section-II** **40 M**

Q.1 **A)** What do you understand by the term Software Development Life Cycle (SDLC)? Why is it important to adhere to a life cycle model while developing a large software product? **5**

**B)** Describe the Rapid Application Development (RAD) model. Discuss each of the phase in detail. **5**

Q.2 **A)** What is Software Requirements Specification (SRS)? List out the advantages of SRS standards. Why is SRS known as the black box specification of a system? **5**

**B)** Discuss the present state of practices in requirement engineering. Suggest few steps to improve the present state of practice. **5**

Q.3 **A)** Discuss the different types of Module Coupling. Consider a simple program to classify a triangle. Its inputs are a triple of positive integers (say x, y, z) and the date type for input parameters ensures that these will be integers greater than 0 and less than or equal to 100. The program output may be one of the following words: [Scalene; Isosceles; Equilateral; Not a triangle]. Design the boundary value test cases. **5**

**B)** Calculate the cyclomatic Complexity of the following code snippet and also determine all the independent paths in the flow graph for the code. **5**

```
#include<stdio.h>
int main()
{
int n1=0, n2=1, n3, i, number;
printf("Enter the number of elements:");
scanf("%d",&number);
printf("\n%d %d",n1,n2);//printing 0 and 1
for(i=2;i<number;++i)//loop starts from 2 because 0 and 1 are already printed
{
n3=n1+n2;
printf(" %d",n3);
n1=n2;
n2=n3;
}
return 0;
}
```

**OR**

**B)** How do you estimate the maintenance cost of the software? Explain with process models. **5**

Q4 **A)**

I. The development effort for a software project is 500 person months. The empirically determined constant (K) is 0.3. The complexity of the code is quite high and is equal to 8. Calculate the total effort expended (M) if: **2.5**

(i) maintenance team has good level of understanding of the project (d=0.9)

(ii) maintenance team has poor understanding of the project (d=0.1)

II. Annual change traffic (ACT) in a software system is 25% per year. The initial development cost was Rs. 20 lacs. Total life time for software is 10 years. What is the total cost of the software system? **2.5**

**B) i.** Discuss the project planning activities. **2.5**

**ii.** What are software metrics and measurements? Explain. **2.5**