Exam Date & Time: 12-Dec-2023 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

VII SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV/DEC 2023

PRINCIPLES OF SOFTWARE ENGINEERING [CSE4306]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) What is Agile methodology? Explain three roles in scrum. (4)

A)

B) Demonstrate how spiral model combines the features of waterfall model and evolutionary prototyping model? (4)

C) Differentiate between alpha testing and beta testing used in user acceptance testing. (2)

2) Design a Level 0 Data Flow Diagram (DFD) for the following scenario.

A) An advertisement is issued giving essential qualifications for the course, the last date for receipt of application, and the fee to be enclosed with the application. A clerk in the Registrar's office checks the received applications to see if marksheet and fee are enclosed and sends valid applications to the concerned academic department. The department checks the application in detail and decides the applications to be admitted, those to be put on the waiting list, and those rejected. Appropriate letters are sent to the Registrar's office which intimates the applicant. (4)

B) Assume that the size of an organic type of software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers is Rs. 15,000/- per month. Using basic COCOMO estimation formula, determine the effort required to develop the software product and the nominal development time. (3)

C) List down the stages in the software configuration management plan. (3)

3) "High cohesion and low coupling are important design goals" Justify this statement. (2)

A)

B) Design a structure chart for the following program code. What are coordinate and (4)

transform modules?

```
main ()
{
 int sum, n , N, a[MAX];
readnums (a , &N);
sort(a , N);
scanf(&n);
sum = add_n(a , n) ;
printf(sum);
} readnums(a , N)
int a [] , *N ;
{ :}
sort(a , N)
int a[] , N;
{ if (a[i] > a[t] ) switch(a[i] , a[t]) ; }
/* Add the first n numbers of a */
add_n(a, n)
int a [] , n ;
{ :}
```

C) List some suggestions for constructing a data flow graph. Design a data flow graph for counting the number of different words in a file. (4)

4) How is the Open-closed principle satisfied using inheritance in Object Oriented Design? illustrate with an example. (3)

A)

B) Design a Use case diagram for the following scenario. Also list the actors in the scenario.

Let us imagine we will develop a browser-based training system to help people prepare for such a certification exam. A user can request a quiz for the system. The system picks a set of questions from its database and compose them together to make a quiz. It rates the user's answers and gives hints if the user requests it. In addition to users, we also have tutors who provide questions and hints. And also, examinators who must certify questions to make sure they are not too trivial. (4)

C) Illustrate Composition and Aggregation in class diagram with suitable examples. (3)

5) How Black box testing differ from White box testing? (4)

A)

B) Explain any six programming practices in structured programming. (3)

C) Why we require refactoring of code in Test Driven Development (TDD)? (3)

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