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National Institute of Technology Hamirpur
End Semester Examination, Even Sem, AY 2022-23
Software Engineering (CS-322)

9/5/2023

12

193

Branch: B. Tech. + DD (CSE)

Time: 2:30–5:30 PM

Duration: 3 hours

Year/Sem: 3rd/6th

Date: 09 May 2023

Max. Marks = 50

Note 1: Attempt all questions from 1 to 5.

Note 2: If required to solve a question, make and state your assumptions clearly.

1.

[5+5=10]

- (a) Given a structure with high fan out, how would you convert it to a structure with a low fan out? Explain using an example. Discuss how can you use metrics to guide you in design process to produce a design that is easy to modify.
- (b) Draw the structure chart of the following program.

```
main();
{
    int x, y;
    x = 0; y = 0;
    a(); b(); }

a()
{
    x = x+y; y = y+5; }

b()
{
    x = x+5; y = y+x; a(); }
```

How would you modify this program to improve the modularity?

2.

[5+5=10]

- (a) What are the main differences between object oriented analysis and object oriented design? What are the main object oriented concepts that are used in object oriented design? How are coupling and cohesion different in function-oriented design and OO design?
- (b) Consider the problem of determining the rate of returns on investments:
An investor has made investments in some companies. For each investment, in a file, the name of the company, all the money he has invested (in the initial purchase as well as in subsequent purchases), and all the money he has withdrawn (through sale of shares or dividends) are given, along with the dates of each transaction. The current value of the investment is given at the end, along with the date. The goal is to find the rate of return the investor is getting for each investment, as well as the rate of return for the entire portfolio. In addition, the amounts he has invested initially, amounts he has invested subsequently, amounts he has withdrawn, and the current value of the portfolio also is to be output.

Create the class diagram and functional model the above problem.

3.

[5+5=10]

- (a) List 5 common coding errors with example of each error.
- (b) What do you understand by refactoring? What is the purpose of refactoring? What are the different ways in which commonly refactorings are done?

4.

[5+5=10]

- (a) What do you understand by testing? What is the main objective of testing? What are the main differences between black box and white box testing?
- (b) Briefly explain Boundary Value Analysis and Control Flow-Based testing using suitable examples.

5.

[5+5=10]

- (a) Consider the following scenario: *You need to develop a social networking website with the following functionalities. First, the user should create his/her account. After that, the user can log in to the system and can change his/her profile picture. The Registered user should also be able to search for a friend.* Write the different use cases in this scenario.
- (b) Is it possible to have a system that can automatically verify completeness of an SRS document? Explain your answer. Construct an example of an SRS that is inconsistent, incomplete and ambiguous.
