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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Introduction to Software Engineering** | **Course Code:** | **SE1001** |
| **Program:** | **BS (SE)** | **Semester:** | **Spring 2022** |
| **Duration:** | **60 Minutes (1 Hour)** | **Total Marks:** | **35** |
| **Paper Date:** | **07-May-2022** | **Weight** | **15%** |
| **Section:** | **All** | **Page(s):** | **3** |
| **Exam:** | **Midterm II** |  |  |
| **Instruction/Notes:** | 1. Attempt all questions on the question paper. Do not submit any extra sheet, it will not be graded.  2. You are allowed to use a single-sided, hand-written, A-4 size help sheet.  3. State your assumptions clearly | | | |

Name: \_\_\_\_\_Solution\_\_\_\_\_\_\_\_\_ Roll Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section \_\_\_\_\_

**Question 1** (2x5 = 10 Marks)

Specify which of the 3 golden rules of UI design is related to each of the following statements/screenshot. Mention the rule and indicate (by circling) whether that rule is being violated or followed.

1. All the applications in MS Office use the cross button to close the windows.

Rule: \_\_\_\_\_\_\_ Make the interface consistent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Followed** or Violated

1. You have developed a game in which the right cursor key makes the player jump, while the up and left cursor keys makes the player go right and left respectively.

Rule: \_\_\_\_\_\_\_ Make the interface consistent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Followed or **Violated**

1. For a banking application, you have provided 10 menus with each menu containing ten to twelve options.

Rule: \_\_\_\_\_\_\_\_ Reduce user’s memory load\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Followed or **Violated**

1. When you are about to close an application with some unsaved data, the system responds “do you want to save your work?”

Rule: \_\_\_\_\_\_\_\_\_\_\_ Place the user in control\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Followed** or Violated

1. The Apple iPhone allows only 4 app icons to sit in the main menu area at the bottom of the screen.

Rule: \_\_\_\_\_\_\_\_ Reduce user’s memory load\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Followed** or Violated

**Question 2** (5x2 = 10)

List the process model that you think will be most appropriate for the following situations. Also, list your reason(s) for choosing a particular model. If you just list the process model without mentioning the reason(s), you will not be awarded any marks.

1. Your team is starting work on a new project, but all the requirements are not clear right now. The internal quality of the project cannot be compromised as it may incur huge financial losses in future. The client requires quarterly releases and (s)he will be providing feedback on each release.

Process Model: Prototyping

Reason(s):

* Requirements are not clear
* Client feedback on releases is possible

1. The management team of Asian airline Inc. is frustrated by long-running projects that failed to deliver results in the expected timeframe.  In fact, many projects in the IT portfolio span multiple years in length and still fail to satisfy important functional requirements.  Management also feels that the airline needed to be more responsive to the marketplace in general. So they have hired you to achieve the following:
   1. Teams can adapt to changing requirements while maintaining a clear focus on the project vision.
   2. Projects should deliver the most valuable features sooner, and provide better project visibility

Process Model: Scrum

Reason(s):

-teams have to adapt to changing requirements (responsiveness), and still make progress

-better project visibility is required

-working software is required soon

-prioritized requirements (most valuable features) need to be implemented soon

**Question 3** (1x10 = 10 Marks)

Provide short (i.e. **less than 4 words**) answers to each of the following questions. Think before you write the answers. Multiple answers, cutting, and overwriting shall lead to disqualification of answer.

|  |  |  |
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| **S#** | **Question** | **Answer** |
| 1 | Which type of cost is increased when we over-modularize? | Integration cost |
| 2 | What is the highest degree of rigor known as? | Formality |
| 3 | Which type of coupling is the most undesired? | Content coupling |
| 4 | Which type of coupling is exhibited if a function receives a user defined class as its parameters? | Stamp coupling |
| 5 | Which type of coupling is exhibited if all functions are using global variables? | Common coupling |
| 6 | What is measure of degree of independence of a module called? | Cohesion |
| 7 | According to the SE Principle Identification of Customers, a programmer is a customer of? | Designer |
| 8 | Which SE principle motivates and requires a software engineer to know the existing libraries? | Reuse |
| 9 | Which model relates the pre-coding phases of software lifecycle with the post-coding phases? | V model |
| 10 | Name an evolutionary process model other than prototyping model | Spiral |

**Question 4** (5 Marks)

#include <cmath>

#include <iostream>

using namespace std;

int main()

{

int x = 1, y = 2;

int m1 = sqrt(x \* x + y \* y);

cout << m1 << "\n";

x = 2, y = 3;

int m2 = sqrt(x \* x + y \* y);

cout << m2 << "\n";

x = 4, y = 5;

int m3 = sqrt(x \* x + y \* y);

cout << m3 << "\n";

cout << m2 << "\n";

}

Rewrite the code to improve **modularity** of the program. The re-written code should perform all the things that the above code performs and should not perform anything that this code does not perform.

#include <cmath>

#include <iostream>

using namespace std;

int squareroot(int x, int y)

{

     int m1 = sqrt(x \* x + y \* y);

     cout << m1 << "\n";

     return m1;

}

int main()

{

    int x = 1, y = 2;

    squareroot(x,y);

    x = 2, y = 3;

    int m2 = squareroot(x,y);

    x = 4, y = 5;

    squareroot(x,y);

    cout<<m2<<"\n";

}