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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:** | **Software Design and Analysis** | **Course Code:** | **CS-3004** |
| **Program:** | **BS (Computer Science)** | **Semester:** | **Fall 2024** |
| **Duration:** | **45 Minutes** | **Total Marks:** | **25** |
| **Quiz Date:** | **30-Oct-24** | **Roll No.** |  |
| **Section:** | **BCS-5C** | **Name:** |  |
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**Question 1) Refactor (improve) the design given below in the light of SOLID principles. Also Mention the principles that are violated by this design. (10 marks)**

**Page**

**Shelf**

**Book**

**A diagram of a computer flowchart

Description automatically generated**

**Question 2) If a cycle occurs in Uses Graph what problem could it potentially cause and how to resolve that issue? Explain in detail. (5 Marks)**

A cycle in a Uses Graph prevents **incremental development**, as it creates dependencies that must be resolved all at once. To address this, **sandwiching** can be used, where a module is divided to break the cycle, allowing each modules to develop independently.

**Question 3 (10 Marks)**

The Sports Event Registration System (SERS) is designed to revolutionize the process of participant registration for sports events, eliminating complexities and ensuring a seamless experience for both organizers and participants. The state diagram for a participant’s registration provides a comprehensive visual representation of the registration phases from initiation to event confirmation.

The first phase of registration is the initiation phase. Once a participant has submitted his/her details through an online form, registration enters the pending approval phase allowing organizers to review the submitted information. If the criteria are met, registration moves to the approved phase. Otherwise, it remains in the pending approval phase. In the approved phase, after the participant has received approval confirmation, registration proceeds to the payment pending phase. Here, the participant is given a specified timeframe of 2 days to make the payment. If payment is not made within this period, registration transitions to the cancelled phase and the process ends. Successful payment made within the specified timeframe transitions registration to the confirmation phase indicating that the participant is officially registered and the process is complete.

**Without making any assumptions, model the above information using a UML 2 state diagram.**

