**Medi-Caps University, Indore**

**CS3CO15 Object Oriented Analysis and Design**

**Lab Manual (Semester-VI) Section: CS (**A+B+C+D+E)

**To develop a mini-project following the 10 exercises listed below:**

1. To develop a problem statement.

2. Develop an IEEE standard SRS document.

3. Identify Use Cases and develop the Use Case model. Also use case writing.

4. Identify the business activities and develop an UML Activity diagram.

5. Identity the conceptual classes and develop a domain model with UML Class diagram.

6. using the identified scenarios find the interaction between objects and represent those using UML Interaction diagrams.

(a) Sequence Diagram

(b) Collaboration Diagram

7. Draw the State Chart diagram.

8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation..

9. Draw Component diagram.

10. Draw Deployment diagram.

**Case Studies:**

1. Represent the following relation using UML diagrams:
2. Students credit 5 courses each semester. Each course is taught by one more teachers.
3. Bill contains a number of items. Each item describes some commodity, the price of unit and total price.
4. An order consists of one more items. Each order item contains the name of the item, its quantity and data by which it is required. Each order item is described by an item type specification object having details such as its vendor address, its unit price, and manufacturer.
5. Stock maintenance system:

Problem Statement: The process of stock maintenance system is that the customer login to the particular site to place the order for the customer product. The stock maintenance system are described sequentially through steps

a.The customer login to the particular site.

b.They fill the customer details.

c.They place the orders for their product.

d.The vendor login and viewsthe customer details and orders.

The main objective of the stock maintenance system is to maintain the stock. It provides the vendor to maintain the stock in an precise manner.

The following UML diagrams describe the process involved in the Stock maintenance system

a. Use case diagram

b. Class diagram

c. Sequence diagram

d. Collaboration diagram

e. State chart diagram

f. Activity diagram

g. Component diagram

h. Deployment diagram

i. Package diagram

3. Chess Game:

Problem Statement: The problem is to design the UML diagrams for a Chess Game using Object Oriented Principles.

I. Draw the state machine diagram for the Chess Game:

(i) A chess game consists of alternate moves of black and white.

(ii) White Moves first.

(iii) Both black’s and white’s turn can end the game.

(iv) A moving player can end the game; winning (checkmate); losing (resign); or with a draw

II. Draw a UML Class Diagram:

The main classes will be:

1. **Spot:** A spot represents one block of the 8×8 grid and an optional piece.
2. **Piece:** The basic building block of the system, every piece will be placed on a spot. Piece class is an abstract class. The extended classes (Pawn, King, Queen, Rook, Knight, Bishop) implements the abstracted operations.
3. **Board:** Board is an 8×8 set of boxes containing all active chess pieces.
4. **Player:** Player class represents one of the participants playing the game.
5. **Move:** Represents a game move, containing the starting and ending spot. The Move class will also keep track of the player who made the move.
6. **Game:** This class controls the flow of a game. It keeps track of all the game moves, which player has the current turn, and the final result of the game.
   1. Online Course Registration System: To design an object oriented model for course reservation system.

Problem statement:

1. Whenever the student comes to join the course he/she should be provided with the list of course available in the college.
2. The system should maintain a list of professor who is teaching the course. At the end of the course the student must be provided with the certificate for the completion of the course.

Identify Use-cases, draw the Use- case diagram.

Identify different classes involved and Draw the class diagram.

Draw the sequence diagram.

* 1. Conference Management System:

Problem Statement: The process of the candidates is to login the conference system and submit the paper through online. Then the reviewer reviews the paper and sends the acknowledgement to the candidate either paper selected or rejected. This process of on conference management system are described sequentially through following steps,

• The candidate login to the conference management system.

• The paper title is submitted.

• The paper is been reviewed by the reviewer.

• The reviewer sends acknowledgement to the candidate.

• Based on the selection, the best candidate is selected.

• Finally the candidate registers all details.

The following UML diagrams describe the process involved in the conference management system.

• Use case diagram

• Class diagram

• Sequence diagram

• Collaboration diagram

• State chart diagram

• Activity diagram

• Component diagram

• Deployment diagram

• Package diagram