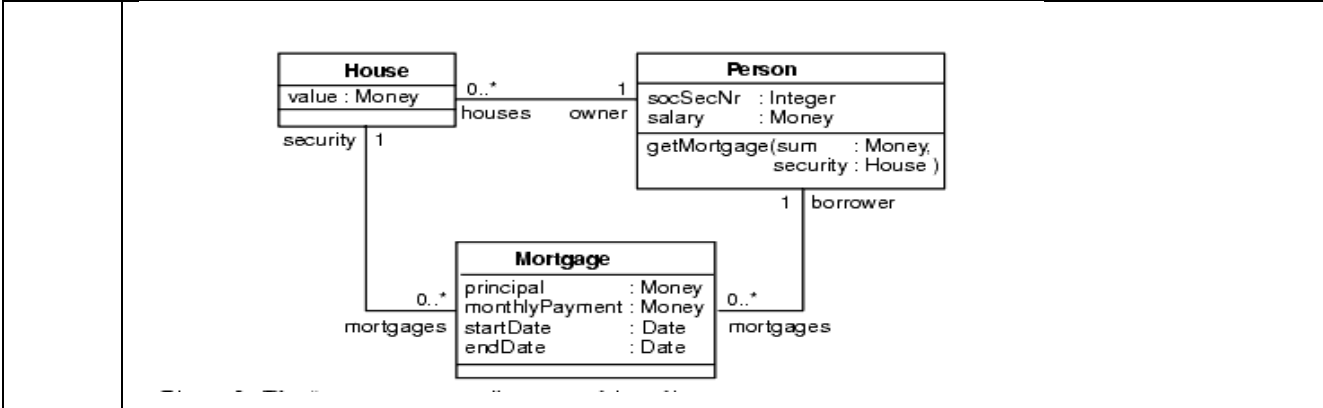|	
Q.1(a)	What is a sequence? Explain domain, range and any 2 functions of a sequence with a suitable example.
Q.1.(b)	Verify the correctness of the design for a program finds the roots of a quadratic equation.
Q.1(c)	Define abstraction level, completeness, directionality and interactivity. How are all these related?
Q.1(d)	Differentiate between content architecture and WebApp architecture.
Q.1(e)	A library requires an application program that is able to read and write information from and into a library card. The information is personal data of the library members and books on loan related information. When a member borrows a book, information about the book will be stored in the library card. On the contrary, related information will be deleted from the library card upon returning the book. The application program will automatically read information from the library card, whenever it is inserted onto its card acceptance device. Owner of a library card is a library employee, which is also a library member. And ownership of a library card is specified by the owner personal data stored in the library card. The attributes stored for an employee may be id,name and division. For book, bookno, title, author, edition and date need to be stored. The maximum number of books a member can borrow is 4. Define operations for borrowing a book, returning a book, storing the employee details in the library database and reading form the library database and printing the information of all employees who have borrowed books. Define the Z schemas showing state, data invariants and operations to specify the above.
Q.2(a)	Name any three generic attributes that differentiate webApps from more conventional Software applications.
Q.2(b)	Consider the figure below which contains three classes: *Person*, *House*, and *Mortgage*, and their associations. A number of rules must apply to this model are: -A person may have a mortgage on a house only if that house is owned by him- or herself; one cannot obtain a mortgage on the house of one's neighbor or friend. -The start date for any mortgage must be before the end date. -The social security number of all persons must be unique. -A new mortgage will be allowed only when the person's yearly income is sufficient.

	-the principal money for any mortgage will not be more than Rs 50 lacs. - A person can have maximum 4 mortgages Use OCL to specify above data invariants and operation getMortgage().
Q.3.(a)	Discuss the role of various types of boxes used in Cleanroom box structure.
Q.3(b)	How does design verification produces better code than unit testing?
Q.3 (c)	Explain steps and models used in certification approach in Cleanroom engineering.
Q.4(a)	Explain various steps in reverse engineering a system. What will be input to this process and what will be the output?
Q.4(b)	How will you forward engineer client server architecture in general where the system to be reengineered requires new GUI interfaces and new communication and security systems? What will be steps used before forward engineering this system for reengineering?
Q.5.(a)	What are various issues in navigation design of a web based applications?
Q.5(b)	Explain all the elements of Interaction model during analysis for webE.
Q.5(c)	How will you carry out configuration testing and load testing for any webApp project?
Q.6.(a)	What is domain engineering? What are the steps in domain analysis process? Is it required in both development with reuse and development for reuse? Justify your answer.
Q.6(b)	How we can measure the improvement in quality, productivity and reduction in cost using component based development?