**Elevator system Problem description:**

An elevator system with two elevators is to be installed in a building with five floors. Each elevator has 7 buttons (one for ground floor, one for each five floors and one emergency button for the help facility) .Upon the selection of the floor from the user the system selects an Elevator to visit the Floor. The system visits outstanding floors on the way to the floor requested by the User. Each floor has two buttons (outside the elevator), except ground and top floor. If the user presses the up-button, an up-elevator is requested. If the user presses the down-button, a down-elevator is requested. Whenever user presses a button, that button gets illuminated. After visiting the destination floor, the elevator cancels the corresponding illumination of that floor. If there is no destination floor then the System asks the elevator to stay at the current floor. The system does not process the user’s request when a failure is occurred and asks user to use Help Facility. Help facility consists of an emergency button inside the elevator. The user can use this facility at the time of failure when he is inside the elevator.

**Functional Requirements**

***FR1: Elevator System***

*FR1.1: Elevator*

The elevator is already available on the floor with doors open. User enters the Elevator and he presses a button of the destination floor. If the user presses the up button then the system requests an up Elevator. The system illuminates the button of the floor. If the user presses the down Button then the system requests a down Elevator. The elevator services all requests from floors eventually with equal priority. If a request is arrived at the same time for two different floors then the elevator selects that floor which is at the smaller distance from its current floor. The elevator visits the corresponding floor. If both the requested floors are at the same distance from the current floor then the system selects visiting the down floor first, then visiting the up floor. The user reaches the destination floor. The system validates that the doors of the elevator are closed after the request is processed. When an elevator has not to service any requests then the elevator remains at its final destination.

*FR1.2: Request Elevator*

The user requests for the Elevator. On the user’s request the system selects an Elevator to visit the Floor. The System maintains the list of floors to be visited. System adds the new Request to the list of floors to be visited. The system determines the next destination Floor from that list. If there is no destination floor then the system asks the Elevator to stay at the current Floor keeping the Elevator Door open. The System commands the Motor to start moving the Elevator either up or down depending on the User’s request. The system visits outstanding Floors on the way to the Floor requested by Elevator User. The Arrival Sensor notifies the system about the arrival of the Elevator. The system commands the Motor to stop. The system validates that the Elevator stops at the requested Floor. The system commands the Elevator Door to open.

*FR1.3: Select Destination*

The elevator is already available on the user’s floor with the door open. The user presses the button of the destination floor. Elevator-Button-Sensor sends the destination floor selected by the user to the system. System adds the new destination floor to the list of floors to be visited. If there is no destination floor then the System asks the elevator to stay at the current floor. The System commands the motor to start moving the elevator either up or down. The system visits outstanding floors on the way to the floor requested by elevator User. The Arrival Sensor notifies the arrival of the elevator. The system commands the motor to stop at the destination floor and the system validates that the elevator stops at the destination floor. The system commands the elevator door to open.

*FR1.4: Open/close doors*

The system ensures that the opening and closing of the door is done automatically. The user can also access the opening and closing of the elevator door manually from the inside of the elevator.

*FR1.5: Request Floor*

The user requests the floor. The user presses the button of the destination floor. Elevator-Button-Sensor sends the destination floor selected by the user to the system. If no destination floor is selected then the System asks the elevator to stay at the current floor.

***FR2: Selection Failed***

The system does not process the user’s request when a failure is occurred. This failure can be hardware failure or software failure. If the user is in elevator when the failure occurs then the system asks him to press emergency button.

***FR3: Help Facility***

Help facility consists of an emergency button inside the elevator. The user can use this facility at the time of failure when he is inside the elevator. At the time of failure the user presses the emergency button to send help request to the system. The system checks the floor from which a help request is arrived and it sends notification to the control room.

***FR4: Control Room***

The control room consists of technicians who immediately checks for the fault when a help request is arrived.

