PART B: (70 MARKS)

INSTRUCTION: *Answer **ALL** questions.*

QUESTION 1 (15 MARKS)

a) Based on the business rules / rules in the following case study provided for an imaginary application on AIRPORT BOARDING; students need to develop the **USE CASE** diagrams.

CASE STUDY: Passenger Check-In and Boarding

We differentiate between **THREE (3)** options for check-in:

Normal check-in with luggage at a normal check-in counter

Express check-in without luggage at a special check-in counter

Automated check-in without luggage at a machine

In addition to the passenger, who represents travellers, there is the check-in representative. The check-in representative is a person who is not the actual passenger, but an agent of the passenger. The check-in representative has the task of performing the check-in with the ticket of the passenger.

The check-in procedure includes submitting the ticket, baggage check-in, seat reservation, and issuing and handing over the boarding pass.

Passengers who only have hand luggage can use express check-in. No baggage check-in is performed.

During boarding, the boarding pass of the passenger is verified at the gate.

Automated check-in is conducted without the help of a check-in clerk, directly at a machine (screen). Baggage cannot be checked in.

The passenger can choose between a normal check-in, automated check-in, and express check-in. The passenger walks to the gate and presents his or her boarding pass. The check-in representative

can perform a regular check-in, but is not able to perform express check-in and automated check-in.

If we take a closer look, we notice that a passenger often travels with luggage, which he or she checks in. Baggage transportation is responsible for loading luggage into the airplane. Baggage transportation is carried out by an independent organization, known as a handling agent. Consequently, it is considered an actor, more specifically, an outside service provider. It does not matter for our diagram that individual employees of the partner enterprise perform these tasks.

Ten minutes before a flight leaves, baggage transportation requests a passenger list from passenger services, which includes every passenger who checked in, but did not board the airplane. On the basis of this list all affected luggage will be unloaded again from the airplane. If the flight is an international flight, the customs authorities of the country in which the destination airport is located also request a passenger list.

(10 marks)

b) In software engineering, a **Good Design** can be defined as:

(**2 marks**)

c) One of the design phases is the algorithm design, give **ANY THREE (3)** approaches that can be used in algorithm design:

(3 marks)