ANKARA UNIVERSITY - DEPARTMENT OF COMPUTER ENGINEERING

COM3068 Software Engineering - Mid-Term Examination – 14 April 2021 - Duration 180 minutes

Student Name	
Student Number	

1) [20] Draw a process model that includes the sub-activities and associated outputs of requirements engineering process.

2) [20] In what type of software development projects, Scrum is considered to be a better methodology to be followed? Can Scrum process model be used for large software projects, why?

3) [20] You are given the following state diagram for a microwave oven controller program.

   a) Extend this state diagram so that it is possible to change the power setting while the oven is in operation.
   b) Show that it is not possible to operate the oven when the door is open according to your new diagram.

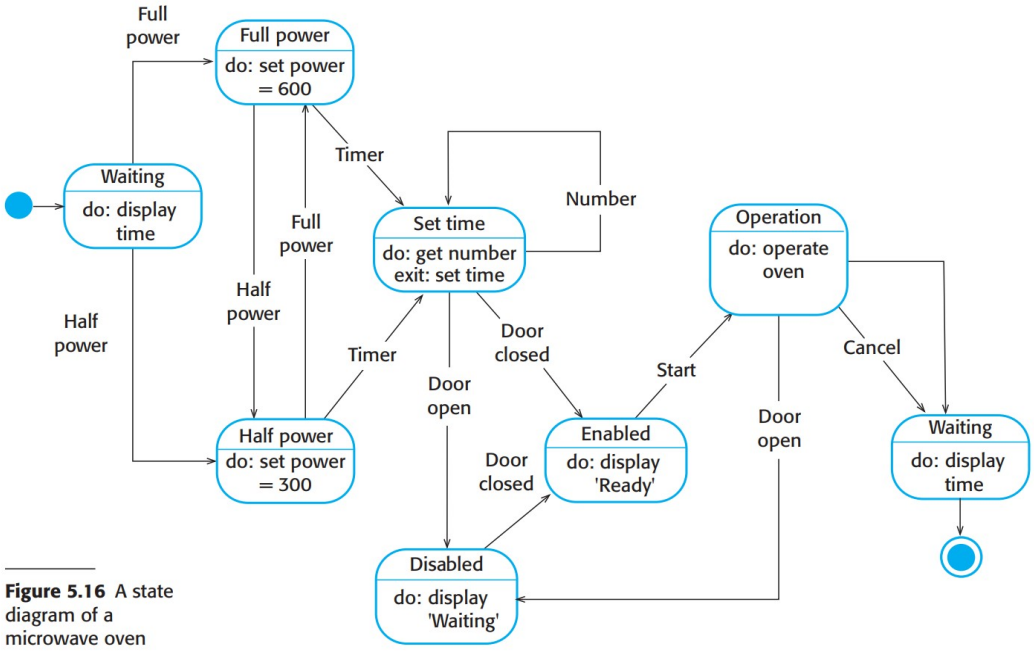

Figure 5.16 A state diagram of a microwave oven

3) Consider the following problem description:

You are to develop an online reservation system for a train company. The train company includes several trains and realizes trips to different cities. Each train is identified by a plate number and a separately assigned train number. The trips are based on a predefined schedule and stop at predefined train stations. Each train can have only one trip per day. Each train includes two conductors, a number of waiters and other personnel. For long trips, the train will stop at intermediate stations. There are two types of trips, normal trips and express trips. Express trips do not stop at intermediate stations and get faster at the destination.

Seats can be reserved by customers on the web site of the train company. The customer has the option to directly pay for the seat through the website. In that case, the seat cannot be cancelled (neither by the customer nor by the company). If the customer has not paid for the seat, the train company can cancel the seat if the customer does not show up one hour before the trip. When the reservation is cancelled, the seat will become free and can be sold to another customer. Both the customer and the company staff must authenticate themselves for performing operations with the system. The application should be able to run both in web and as an android application which require different views.

a) [5 pts] Draw a use case diagram for describing the functional requirements of the above system.

b) [5 pts] Identify and justify two non-functional requirements that could be important for the above system. Can you identify any conflict between these two req ?

c) [10 pts] Develop an analysis level class model for the software system described above.

d) [10 pts] Draw a sequence diagram for seat reservation use case.

e) [10 pts]. What would be a good architectural design for this software system? Why?