BLG411E- Software Engineering
2015-2016 Midterm Exam

Date:	10.11.2015
Duration:	105 mins.
Instructors:	Assist. Prof. Dr. Tolga OVATMAN
	Assist. Prof. Dr. A. Cüneyd TANTUĞ
Notes:	Closed book, dictionaries and calculators are **NOT** allowed!

Student ID:	**Name, Surname:**	**Signature:**

Q1) **[50 points]** A simple batch payroll system (bordrolama sistemi) consists of a database of the employees in the company, and their associated data such as timecards. The system must pay each employee. Employees must be paid the correct amount, on time, by the method that they specify. Also, various deductions must be taken from their pay.

- Some employees work by the hour. They are paid an hourly rate which is one of the fields in their employee record. The payroll system should request the timecards from the Time Attendance System (TAS) by web services. They submit daily time cards which record the date and the number of hours worked. If they work more than 8 hours per day, they are paid 1.5 times their normal rate for those extra hours. They are paid every Friday.

- Some employees are paid a flat salary. They are paid on the last working day of the month. Their monthly salary is one of the fields in their employee record.

- Some of the employees are also paid a commission based on their sales. They submit sales receipts which record the date and the amount of the sale. Their commission rate is a field in their employee record. They are paid every other Friday.

- Employees can select their method of payment. They may have their paychecks mailed to the postal address of their choice; they may have their salary in cash directly from the company; or they can request that their paychecks be directly deposited into the bank account of their choice.

- Some employees belong to the union (sendika). Their employee record has a field which holds the weekly dues (aidat) rate. Their dues must be deducted from their pay. Also, the union may assess service charges against individual union members from time to time. These service charges are submitted on paper by the union on a weekly basis. Any such service charges must be deducted from the employee's next pay amount.

- The payroll application will run once each working day, and will calculate the payment amounts of the employees on that day. The system will generate payments for records between the last time the employee was paid, up to the specified date.

- The system is going to generate weekly, monthly and yearly audit log records to be investigated by the government regulatory agency.

a) **[5 points]** Suggest a project management approach for development of this system. Explain your choices.

b) **[10 points]** Present a WBS of the system.

c) **[10 points]** Offer a PERT chart and identify critical paths.

d) **[10 points]** Give the use case scenario for salary payment of union workers.

e) **[15 points]** Draw a candidate E-R diagram for the system. Draw Level-1 DFD diagram.

2) (50 points) Answer each of the following questions using <u>a few sentences</u>.

   a) What is a Project Charter?

   b) Explain the distinction between iterative software development methods and incremental software development methods

   c) Why is Refactoring important in agile methodologies?

   d) Draw a Burndown chart and describe its important elements.

e) Explain why it is not a good practice to use only unadjusted function points in effort estimation?

f) What is the difference between a variation and a version?

g) Give five examples to non-functional requirements.

h) What is the traceability of requirements?

i) What is a Domain Model?

j) Write down the difference between a functional model and a behavioral model.

YOU MAY USE THE FOLLOWING PAGES FOR ANSWER 1 <u>ONLY</u> !!!

ANSWERS OF QUESTION 2 ON THESE SHEETS WILL NOT BE EVALUATED !!!