**Eastern Mediterranean University - Computer Engineering Department**

**Software Engineering Program**

**CMSE-201 Fundamentals of Software Engineering - Midterm Exam**

**Std Id\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Std Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Instructor: Alexander G. Chefranov**

**Duration: 100 Minutes March 26, 2024, 10.30**

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**Three A4 sheets of paper with *your* *handwritings* (not photocopies, printouts, etc.) may be used for your help. Electronic devices are not allowed. Passing of any material (rubbers, pencils, etc.) is not allowed.**

**There are 4 questions (totally, 100 points), 5 pages**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Q1** | **Q2** | **Q3** | **Q4** | **Total** |
| **Point** | **25** | **25** | **25** | **25** | **100** |

**Good Luck!**

**Q1) 25 points Ch1 Introductiom**

What are the nine application types? Fill in the table below

|  |  |
| --- | --- |
| **#** | **Application type** |
|  | **Standalone** |
|  | **Interactive transaction-based** |
|  | **Embedded control systems** |
|  | **Batch processing systems** |
|  | **Entertainment systems** |
|  | **Systems for modeling and simulation** |
|  | **Data collection systems** |
|  | **Systems of systems** |
|  | **Utilities** |

**Q2) 25 points Ch2 SDLC Models**

1. What is the software development life cycle model? (6 points)

It is a framework that describes activities related to the software development

1. What is the waterfall software development life cycle model? (6 points)

Waterfall SDLC is represented by the sequence of phases: software requirements specification, design, implementation, testing, and transition with the next phase starting only after full completion and documenting of the previous phase

1. Why documentation is an advantage of the waterfall model? (6 points)

It is an advantage because allows rather easy maintaining and evolving the system

1. Why documentation is a disadvantage of the waterfall model? (7 points)

It is a disadvantage because writing documentation requires much time

**Q3) 25 points Ch3 Requirements Engineering**

1. What is the user requirement? (6 points)

It is a not detailed description of services and operational constraints expressed in natural language

1. What is the system requirement? (6 points)

It is a detailed description in structured form of services and operational constraints

1. Give an example of the functional user requirement (**6 points)**

Banking application shall allow money transfer

1. Give an example of the functional system requirement related with question c) above (**7 points**).

Banking application shall do money transfer that is deduct money from some client’s account and transfer it to the target specified by the client under the following constraints:

1. The user is valid
2. The user has an account in the bank
3. If the currency of the money is the same as of the account then the balance of the account is not less than the amount of money to be transferred
4. If the currency of the account differs from that of the money then after applying exchange rate to the balance result shall be not less than the requested money
5. If the balance of the account is not enough then the transaction can’t be made
6. Validate the target of the money transfer
7. If the target is not valid then the transaction can’t be made

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Q4) **25 points** Ch4 Project Management

1. What ate the five universal management activities? (5 points)
2. Project planning 2) risk management; 3) people management; 4) reporting; 5) proposal writing
3. Why risk management is important? (5 points)

It is important because if risks are not estimated and contingency plans are not prepared, in the case of the risk occurrence the project can fail

1. What are the three types of risks? (5 points)
2. Project risks; 2) product risks; 3) business risks
3. What are the four management activities? (5 points)
4. Risk identification 2) risk analysis; 3) risk planning; 4) risk monitoring
5. For the risks with their probabilities and losses in the table below, estimate expected losses related to risk exposures # 2 and 3 (5 points). Show your calculations, give explanations

|  |  |  |  |
| --- | --- | --- | --- |
| # | Risk | Probability | Loss |
|  | Delay in financing | 60% | $ 20M |
|  | Delay in patent and trademark | 40% | $ 3M |
|  | Problem with staff hiring | 40% | $ 2M |
|  | Staff turnover | 60% | $ 4M |

Expected losses = 0.4\*3.3+0.4\*2=2 M is calculated by summing product of respective probability and loss.