



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

**B.Sc. in Applied Sciences  
Second Year - Semester I Examination – July/ August 2023**

**COM 2301 - SYSTEM ANALYSIS AND DESIGN**

**Time: Three (03) hours**

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- This paper contains **Five (05)** questions on **Five (05)** pages.
  - The total maximum mark attainable is **Hundred (100)**. The marks assigned for each question and section, thereof are indicated in square brackets.
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1. (a) Compare and contrast the requirement gathering process for bespoke software with generic software. (04 marks)
- (b) Describe why the project team need to spend lot of resources immediately on and after the installation day. (04 marks)
- (c) Describe how the lower CASE tools will help the software engineers. (02 marks)
- (d) Assume that you are developing a mobile app for a movie store. Describe how the following organizational environments:
  - i) Demographic profiles
  - ii) Market factors
  - iii) Competition
 (02x3 marks)

- (e) Describe the effect of immersing satellite internet services on virtual companies and virtual teams. (02 marks)
- (f) Describe the activities of a low-level (operations) manager. (02 marks)
- 2. (a) What would be the problems that you will face when using Extreme programming approach with strategic managers as your end user. (04 marks)
- (b) Describe your opinion on the disadvantages of using UML designing for agile process models. (03 marks)
- (c) Compare and contrast when to use interviews and when to use questionnaires. (03 marks)
- (d) Describe the importance of Observation methods when compared to other requirement gathering methods such as document analysis, interviewing, questionnaires, etc. (04 marks)
- (e) Describe the how the problems with the natural language will affect observation (of organizational members). (02 marks)
- (f) Briefly describe the problems with STROBE techniques. (02 marks)
- (g) Briefly describe the problems with using mathematical specifications for requirements compared to using natural language specifications. (02 marks)
- 3. (a) Describe how UML will be used in the waterfall model. (05 marks)
- (b) Describe why you need to use CASE tools for requirement management. (05 marks)
- (c) Briefly describe the importance of "Adaptability" in requirement reviews. (02 marks)
- (d) Briefly describe the importance of "Verifiability" in requirement reviews. (02 marks)
- (e) Describe how having redundancies in to increase the Availability of a system will adversely affect the Security of a system. (03 marks)
- (f) Briefly describe three (03) UI design principles. (03 marks)
- 4. (a) Describe your opinion of "coupling and inheritance" in object oriented systems. (04 marks)
- (b) Describe why the pipeline/ data-flow model is not suitable as a modular decomposition method for interactive systems. (02 marks)
- (c) Briefly describe two (02) volatile requirement types. (02 marks)

- (d) Describe how volatile requirements affect the risk management process. (04 marks)
- (e) Briefly describe two (02) reasons why scheduling problems happens in project management. (02 marks)
- (f) Briefly describe the risk analysis process. (02 marks)
- (g) Describe the process of "project scheduling". (04 marks)
- 5. (a) Draw the activity diagram for the following use case scenario. (06 marks)

Pre-condition: The customer has a valid ATM card.  
 The ATM machine is in working order.  
 The ATM machine has enough cash.

Success Case

1. Customer inserts the ATM card in to the ATM machine.
2. ATM machine prompts to the customer to enter the pin.
3. Customer enters the PIN.
4. PIN is validated by the bank
- E1 – Pin number is incorrect*
5. ATM prompts the user with option menu
6. User select the option to withdraw cash.
7. ATM machine prompts to the customer to enter the required amount.
8. Customer enters the required amount for withdrawing.
9. Bank checks the account balance.
- E2 – Balance is not sufficient for withdrawal*
10. ATM gives out cash and prints the receipt.
11. User removes the cash and receipt.
12. ATM again prompts the user with option menu

Post-condition: User has taken cash and can do another transaction or end the transaction.

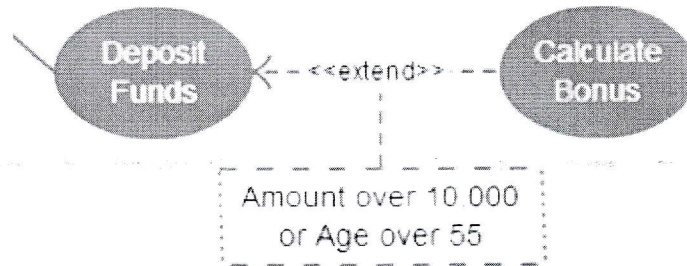
*E1 – Pin number is incorrect*

1. ATM ejects the card.
2. End transaction.

*E2 – Balance is not sufficient for withdrawal*

1. ATM displays the balance of the customer account.
2. ATM ejects the card.
3. End transaction.

- (b) Describe what happens in the following extend relationship. (02 marks)



- (c) Draw the class diagram for the following code.

(04 marks)

```

class Parent
{
public:
    Parent(){cout<<"Parent()"<<endl;}
    void say(){cout<<"sayParent()"<<endl;}
    virtual void saySpecial()=0;
};

class Child: public Parent
{
public:
    Child(){cout<<"Child()"<<endl;}
    void say(){cout<<"sayChild()"<<endl;}
    void saySpecial(){cout<<"saySpecial()"<<endl;}
};
    
```

- (d) Draw an Activity network based on the given task durations and dependencies. A sample calendar is given. Assume that there are no holidays except weekends. Assume that you start with January 1<sup>st</sup> which is a Monday. Include the dates for the milestones and finish date.

(08 marks)

Activity	Duration (days)	Dependencies
T1	7	
T2	14	T1, T4 (M2)
T3	12	
T4	10	
T5	11	T1 (M1)
T6	6	T1, T3 (M3)
T7	9	T5, T6 (M4)
T8	8	T2, T5 (M5)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

**END**