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Department of Computer Science & Engineering
B. Sc. in Computer Science & Engineering (B. Sc. CSE)
Semester Final Examination 2018 (Jan-Jun)
Level 3 Semester I, Course Code: CSE 301, Credit: 3.0
Course Title: Software Engineering



Total Marks: 96

Time: 3 Hours

Figure on the right side indicates the mark for the respective question.
Split answer is not allowed and will be discarded.

Section - A

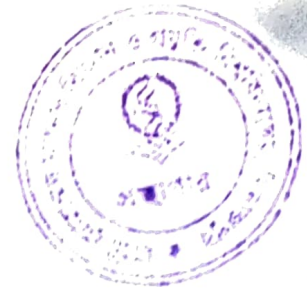
Answer any three questions from this section.

- 1.(a) What is an SRS document and why is it required? 2+2=4
- (b) List down with short notes the common sections of an SRS document structure. 8
- (c) Mention some problems those may occur while expressing user requirements using natural language. 3
- 2.(a) Define *design pattern* and its necessity in designing a software solution. 2+2=4
- (b) Describe Observer design pattern with proper diagrams showing how the display of an object's state can be separated from the object itself. 5
- (c) Using the UML graphical notation for object classes, design the following object classes, identifying attributes and operations. Use your own experience to decide on the attributes and operations that should be associated with these objects. 3x2=6
- (i) A telephone, (ii) a printer for a personal computer, (iii) a bank account
- 3.(a) Identify possible objects in the following system and develop an object-oriented design for that. You may make any reasonable assumptions about the system when deriving the design. 3x3=9
- A filling station (gas station) is to be set up for fully automated operations. Drivers swipe their credit card through a reader connected to the pump; the card is verified by communication with a credit company computer, and a fuel limit is established. The driver may then take the fuel required. When fuel delivery is complete and the pump hose is returned to its holster, then driver's credit card account is debited with the cost of the fuel taken. The credit card is returned after debiting. If the card is invalid, the pump returns it before fuel is dispensed.*
- [Hint. Common OOD processes include (i) to define the context and modes of use (ii) system architecture (iii) to identify principal system object classes]
- (b) Draw a sequence diagram showing the interactions of objects in the gas filling station system when a driver wants to take 50 litre of gasoline using credit card. 6
4. Clearly and concisely describe the following -
- (a) The components of the MVC software architecture. 6
- (b) The interaction between the components of the MVC architecture. 5
- (c) The mapping from this MVC architecture to the client-server computing architecture. 4

Section – B

Answer any three questions from this section.

Split answer is not allowed and will be discarded.



- 1.(a) Explain why Boehm's spiral model is an adaptable model that can support both change avoidance and change tolerance activities. 5
- (b) Extreme programming expresses user requirements as stories, with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description. 4
- (c) Explain how the principles underlying agile methods lead to the accelerated development and deployment of software. 6
- 2.(a) What is the key idea of Test-Driven Development (TDD)? 4
- (b) State two advantages and two limitations of TDD. 4
- (c) Using your knowledge of how an ATM (automated teller machine) is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system. 7
- 3.(a) What is software architectural design and why is it required. $2+2=4$
- (b) Describe *pipe and filter* architectural pattern and two suitable use cases with proper diagrams. $3+2+2=7$
- (c) Write out the reasons for the failure of Water Fall Model. 4
- 4.(a) What are functional and non-functional requirements? $1.5 \times 2 = 3$
- (b) List and explain different types of testing done during the testing phases. 6
- (c) What is user acceptance testing? Explain different testings in user acceptance testing. $2+4=6$