



UCSC

University of Colombo, Sri Lanka

University of Colombo School of Computing



**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY
(EXTERNAL)**

Academic Year 2023 — 2nd Year Examination — Semester 4

IT4406 — Agile Software Development

Part 2 - Structured Question Paper

(2 Hours for both Part 1 and Part 2)

To be completed by the candidate

Index Number

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Important Instructions

- This paper has **two (2) parts, Part 1 and Part 2**.
- The total duration of **both Part 1 and Part 2 is 2 hours**.
- The final mark for the paper will be determined by averaging the scores of Part 1 and Part 2, each of which is graded out of **100**.
- The medium of instructions and questions is English. Students should answer in the medium of English language only.
- This paper (Part 2) has **2 questions on 6 pages**. Answer **both** questions.
- Write your answers **only on the space provided** on this question paper.
- Do not tear off any part of this question paper. Under no circumstances may this paper (or any part of this paper), used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper. If a page or part of a page is not printed, please inform the supervisor/invigilator immediately.
- Any electronic device capable of storing and retrieving text, including electronic dictionaries, smartwatches, and mobile phones, is not allowed.
- Calculators are **not allowed**.
- *All Rights Reserved*. This question paper can NOT be used without proper permission from the University of Colombo School of Computing.

**To be completed by
the examiners**

1	
2	
Total	

1) (a)

- i. Define the term '**Work in Process (WIP)**' in Agile.

(3 marks)

WIP refers to the amount of work that has been started but is not yet completed in the workflow.

- ii. Describe **two (02)** methods that can be used for managing **Work in Process (WIP)** in Agile teams.

(8 marks)

Kanban Boards: Visualizing work and setting WIP limits for each stage of the process helps teams manage their flow and identify bottlenecks.

Daily Stand-ups: Monitoring progress during daily stand-ups allows the team to discuss ways to unblock and complete tasks efficiently.

- (b) Answer questions **1(b)** based on the information provided in **Figure 1** below.

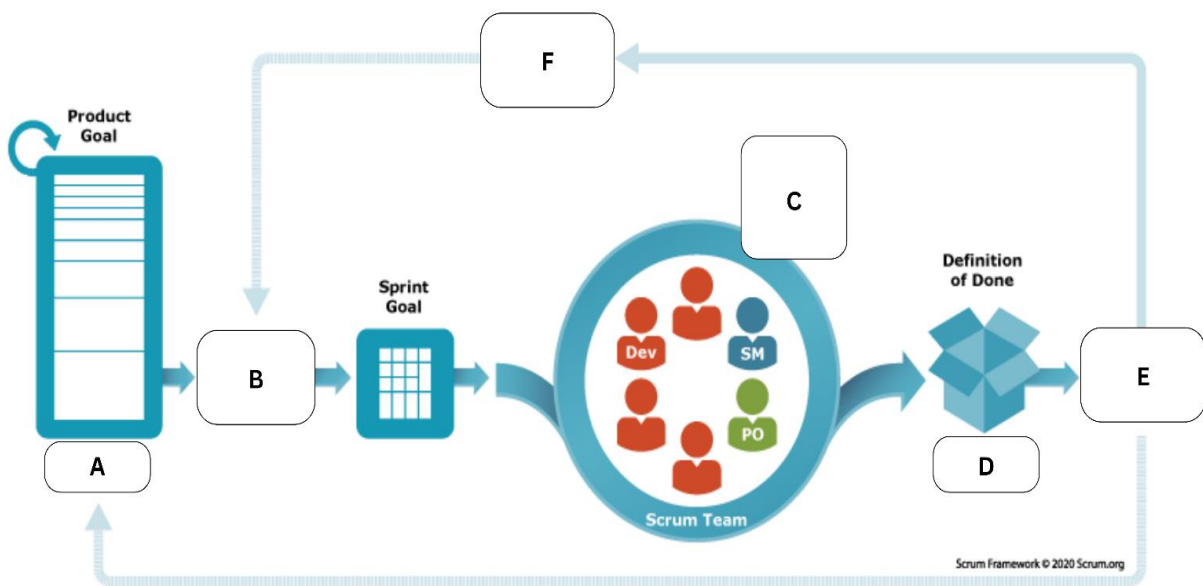


Figure 1: Scrum Framework

- i. Identify the labels **A–F** associated with the Scrum Framework.

(12 marks)

A - Product Backlog
B - Sprint Planning
C - Daily Scrum
D - Increment
E - Sprint Review
F - Sprint Retrospective

- ii. Briefly describe the purposes of **A** and **D** in the Scrum framework.

(6 marks)

A -

The Product Backlog is a prioritized list of all desired work on the project, including features, enhancements, and bug fixes. The purpose of the Product Backlog is to serve as the single source of requirements for any changes to be made to the product. It is continuously updated and refined to reflect the changing needs and priorities of the stakeholders. It enables the Product Owner to prioritize work based on business value and stakeholder input, ensuring that the team works on the most valuable tasks first.

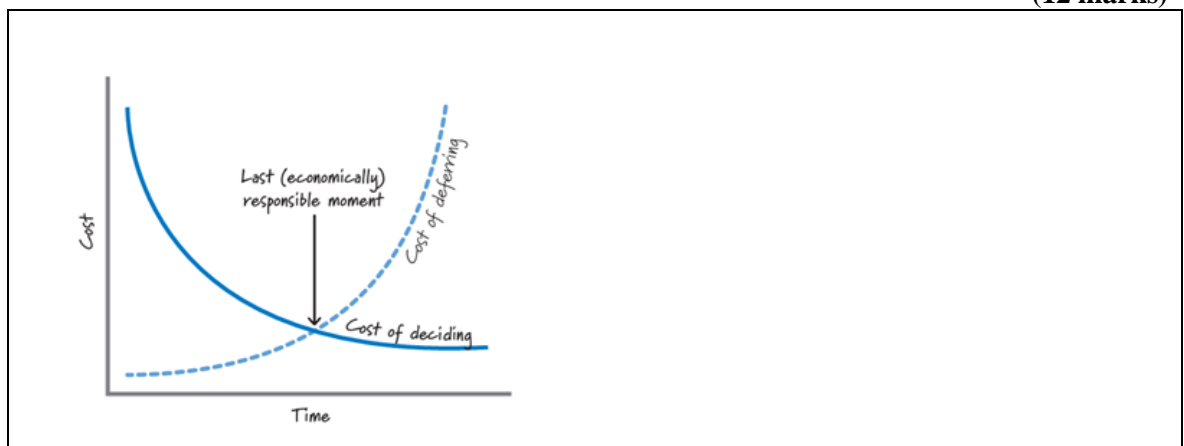
D -

Increment: the sum of all the Product Backlog items completed during a sprint, combined with the increments of all previous sprints. The purpose of the Increment is to provide a usable and potentially shippable product at the end of each sprint. It represents the progress made by the team towards the final product. The Increment allows stakeholders to assess the progress and functionality of the product regularly, facilitating feedback and enabling continuous improvement (Similar Answers are acceptable)

- (c) Draw a graph to illustrate the relationship between the “*Cost of Deferring*” and the “*Cost of Deciding*” over time.

- i. Label the axis and curves appropriately.
 ii. Indicate and label the optimal ‘*point to make a decision*’ on the graph with the most suitable term.

(12 marks)



- (d) Briefly explain the following **characteristics** expected from the **Development Team**.

(9 marks)

Self-Organizing -

In Scrum, a self-organizing team is one that is empowered to manage its own work and make decisions on how to achieve the Sprint Goal without being directed by external authorities

Musketeer Attitude -

The "Musketeer attitude" refers to a team spirit where all members operate with a sense of "all for one and one for all." This means that team members support each other, work collaboratively and share responsibilities.

Long-Lived -

A long-lived team in Scrum is one that remains intact over a long period, working on multiple projects or releases. This stability allows the team to develop strong working relationships and deep domain knowledge.

Continued...

2) (a) Complete the following sentences with most suitable words.

- i. "In **Unit Testing**, there are two (02) types of **test doubles** used for replacing dependencies, such as
 1. _____(A)_____: Replaces a depended-on component with a component that has an identical _____(B)_____ that produces specific reactions (returns certain values according to a predefined pattern).
 2. _____(C)_____: A _____(A)_____ with additional technique of recording calls and data handed over by the test object. Recorded data can use to _____(D)_____."
- ii. "A **sprint** is a short, _____(E)_____ period in which a scrum team works to complete a set amount of work. A release is typically composed of multiple _____(F)_____, each of which delivers customer or user value. A sprint cycle has key phases such as sprint _____(G)_____, sprint execution, sprint review, and sprint _____(H)_____."

(16 marks)

- A - Stub
- B - Interface
- C - Spy
- D - Debugging/Debug
- E - Time-boxed/time-limited
- F - Sprints
- G - Planning
- H - Retrospective

(b) "Looking back at the sprint execution is a less appreciated yet important practice."

Identify **two (2)** useful questions that the team should direct their attention after **the sprint conclusion**.

(6 marks)

(Any 2 of the following):

What worked well this sprint that we want to continue doing?

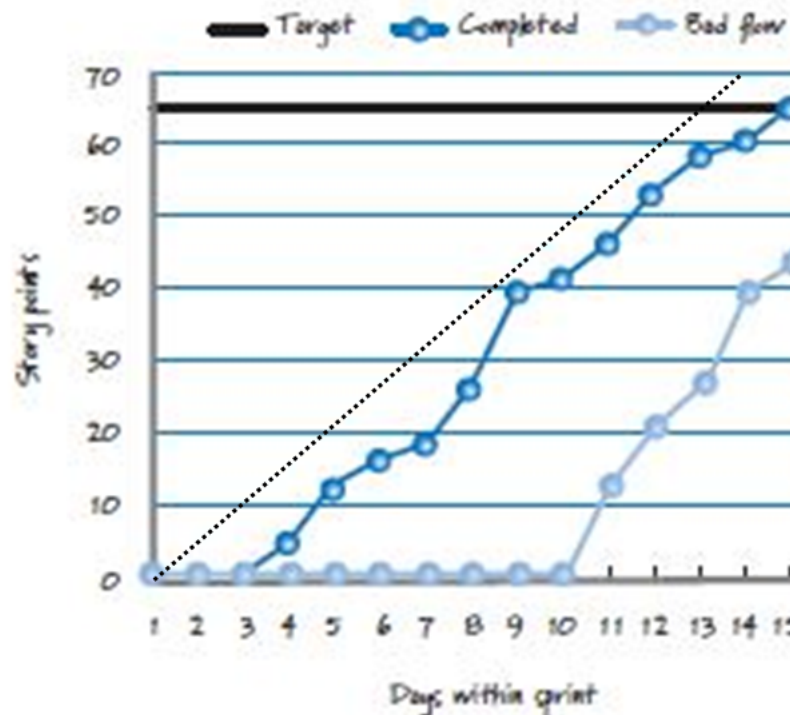
What didn't work well this sprint that we should stop doing?

What should we start doing or improve?

- (c) Assuming a 14-day sprint and marking daily progress with a + symbol and connecting lines between them, draw a **burnup chart** of 40 story points (with both axes marked) imagining a typical progress of sprint execution of an agile team. Also, in a dotted line draw an 'ideal progress line'. Write a brief explanation of the two lines.

(18 marks)

The answer should be closely matching to the following diagram, the bad flow line is not relevant to the question. The ideal line is marked in dotted line. Target line should be 40, No days should be 14



- (d) Identify and briefly explain **two (02)** key differences in **planning** of traditional and agile software development approaches.

(10 marks)

Traditional Approach:

Believe the possibility to produce a detailed plan up front before development work begin.

Get it right at the beginning so that rest can follow in an orderly fashion

Agile Approach:

Believe the impossibility to produce all of the planning artifacts up front
Up-front and just-in-time planning
