UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2010 – 2nd Year Examination – Semester 4

IT4305: Rapid Software Development

Part 2: Structured Question Paper

21st February 2021

(ONE HOUR)

To be completed by the candidate

BIT Examination Index No: _____

Important Instructions:

- The duration of the paper is **1 (one) hour**.
- The medium of instruction and questions is English.
- This paper has **3 questions** in **11 pages**.
- **Answer all questions.** The first question carries 40 marks. Second and third questions carry 30 marks each.
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book, 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 is not printed, please inform the supervisor immediately.

Questions Answered

Indicate by a cross (×), (e.g. 1) the numbers of the questions answered.

To be completed by the candidate by marking a cross (×).	**1**	**2**	**3**	
To be completed by the examiners:				

Index No …….

1. a) *One of the challenges in software engineering is responding to the ever-changing environment.*

i. One of the reasons the software project environment may change is *Changes in technology.* List three (03) other reasons.

(2*3=6 marks)

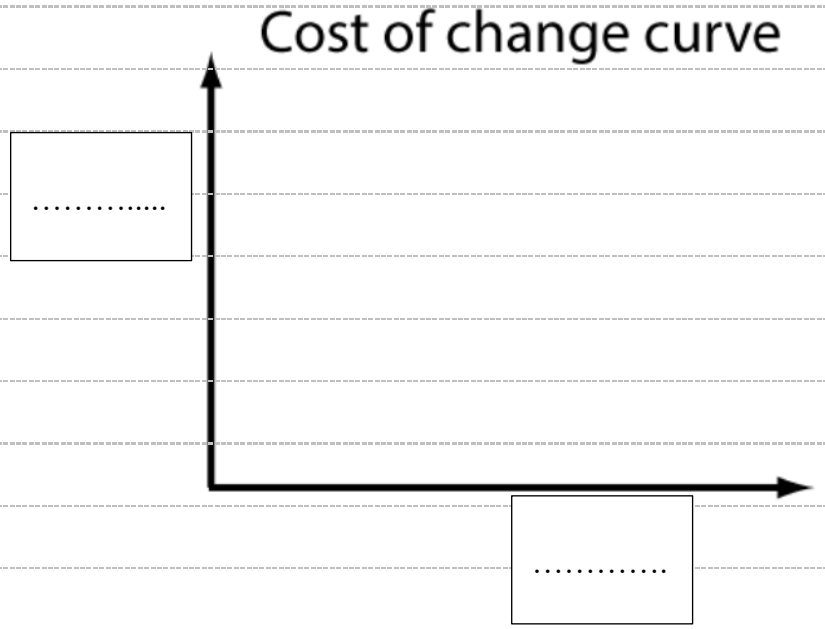
ANSWER IN THIS BOX
Changes in Requirements
Changes in Design, Implementation
Changes in Team/personnel
Changes in users/client contacts
Changes in the organization/upper management
Changes in {internal factors and stakeholders}
Changes in {external factors (politics, pandemics etc.) and stakeholders}

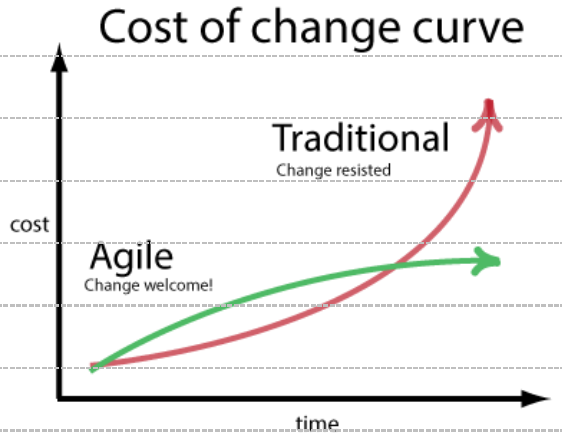
ii. *In traditional software development projects, sometimes Requirement change requests are rejected as there would be higher costs late in the development.*

Illustrate the *Cost of Change* curves for both Traditional and Agile software projects. Use the given chart to illustrate both curves and label the curves appropriately.

(6 marks)

ANSWER IN THIS BOX





Breakdown: { 2 – traditional curve; 2 – Agile curve } = 4 marks

{ 1 – X axis; 1 – Y axis } = 2 marks

b)

i. List four (04) principles of *Lean*.

(2*4=8 marks)

ANSWER IN THIS BOX

Eliminate waste

Amplify learning

Decide as late as possible

Deliver as fast as possible

Empower the team

Build integrity in

See the whole

ii. *Kanban supports incremental, evolutionary change while also respecting the current process, roles, responsibilities, and titles.*

Do you agree with this statement? Justify your answer.

(2+4=6 marks)

ANSWER IN THIS BOX
Yes/No: Yes
Justification: Often there are high resistance and fear in organization for
broad sweeping changes. In Kanban, we seek to follow a lean approach into
Agile development. Therefore change may be inevitable, but if we make
small continuous changes while respecting current processes, roles,
Responsibilities and status quo, the change management would be much
Easier and simpler.

c)

i. *In Scrum, balancing predictive up-front work with adaptive just-in-time work in an economical way is important.*

Briefly justify the above statement.

(4 marks)

ANSWER IN THIS BOX
While being overly predictive would require us to make many
assumptions and would increase the cost of change exponentially later in the
development, too much adaptability would make things chaotic and inefficient.
Therefore we need to balance the two in an economically sensible manner all
the while minimizing the up-front planning. Up-front work still should be
there, but not to the excessive level present in plan driven development.

ii. Write an example User Story.

(6 marks)

ANSWER IN THIS BOX
As a shopper
I can read product reviews
So that so that I can decide on whether to buy the product or not
{ Full marks can be given even if the student has directly given any example
user story in the given template. 2*3}

iii. What is the difference between *Epics* and *User stories*?

(4 marks)

ANSWER IN THIS BOX
Epics are larger user stories. Larger as in larger in scope. While user stories
Contain few days' worth of work at most, Epics contain requirements that are
too big to be implemented in a single iteration. Therefore, we usually
break them down into smaller user stories.

2. The following questions are related to the Scrum framework.

a) Every Scrum team needs to have a single person who is identified as the *product owner*. It is also allowed for a team of people to perform the product owner role. That team is called a *product owner team*.

i. Briefly explain why some projects may need teams as *product owner*?

(4 marks)

ANSWER IN THIS BOX
There are times when the scope of the product owner activities may be too large
for any one person to adequately perform. In such cases, we might have a
product owner team that includes people who focus on strategy and marketing.
However, there will always be a single individual who functions in the product
owner role for a Scrum team.

ii. Match the given Responsibility with the most suitable Scrum Role by writing the correct label of the Scrum Role (A - C) in the box in front of each responsibility (a - f).

A – Product Owner
B – Scrum Master
C – Development Team

a. Remove impediments that are decreasing the team's productivity. [B]

b. Define acceptance criteria and verify that they are met. [A]

c. Protects the team from outside interferences. [B]

d. Provide requirements representing the entire stakeholder community. [A]

e. Grooming the product backlog. [A]

f. Designing and implementing product backlog items. [C]

(1*6 = 6 marks)

b) Briefly explain the *Release planning* phase of a scrum framework, by answering the following questions.

i. What is the main goal of the Release Planning phase?

(2 marks)

ANSWER IN THIS BOX
The goal of release planning is to determine what constitutes the next release
and what the desired level of quality is.
Release planning is a long-term planning which enable us to determine the cost,
scope, date of a release while balancing the customer values and the overall
quality of the product.

ii. Name two (02) participants who take part in the release planning phase.

(2*2=4 marks)

ANSWER IN THIS BOX
Stake holders (direct users, in-direct users, managers)
Scrum team (development team, product owner, scrum master)

c) Scrum project teams scale by having multiple right-sized Scrum teams.

i. State two (02) techniques used in multiple team coordination when there is more than one Scrum team.

(2*2=4 marks)

ANSWER IN THIS BOX
Scrum of scrums
Release train

ii. Briefly explain **one** of the two techniques explained in (c) (i) above.

(4 marks)

ANSWER IN THIS BOX
Scrum of scrums
Scrum of scrums (SoS) allows multiple teams to coordinate their inter-team work.
The team that performs the SoS is composed of individual members of the
various development teams.
Typical SoS is not held every day but instead a few times a week as needed.
Release train
A release train is an approach to aligning the vision, planning, and
interdependencies of many teams by providing cross-team synchronization
based on a common cadence.
The train metaphor is used to imply that there is a published schedule of when
features will "leave the station."

iii. "In the Scrum development process, more frequent, smaller releases are recommended"
Do you agree with the above statement? Justify your answer.

(2+4=6 marks)

ANSWER IN THIS BOX
Yes/ No: Yes
Justification: Scrum favours smaller, more frequent releases because they
provide faster feedback and improve a product's return on investment. We can
almost always improve the lifecycle profits of our product by leveraging
incremental development and multiple releases of smaller marketable subsets of
Features

3. a) Match correct terms from the following list of terms with the most suitable description in the following table.

{ Customer tests, Exploratory tests, Incremental requirements, Performance optimization, Refactoring, Spike solutions, Technical debt }

(2*5 = 10 marks)

Term	Description
Customer tests	Help to communicate tricky domain rules.
Refactoring	Enable programmers to improve code quality without changing its behaviour
Incremental requirements	Allow the team to get started while customers work out requirements details.
Exploratory tests	Enable testers to identify gaps in the team's thought processes.
Spike solutions	Use controlled experiments to provide information.

b) *Pair programming* is one of the common practices in XP. Name another three (03) such practices.

(3*2=6 marks)

ANSWER IN THIS BOX
Energized work
Informative workspace
Root cause analysis
Retrospectives

c) *In XP, On-site customers are responsible for providing programmers with requirement details upon request.*

Briefly explain how the above task is practiced in XP.

(4 marks)

ANSWER IN THIS BOX
On-site customers are responsible for figuring out the requirements for
the software. When programmers need information, they simply ask.
Customers are responsible for organizing their work so they are ready
when programmers ask for information. They basically act as living
requirement documents researching information in time for programmer use
and providing it as needed. They achieve this through communicating
requirements by creating mock-ups, reviewing work in progress, Creating
detailed customer tests that clarify complex business rules.

d) Briefly explain the main difference between *Interaction designers* and *Graphic designers* in the context of XP.

(4 marks)

ANSWER IN THIS BOX
Graphic designers usually convey ideas and moods via images and layout etc.
But interaction designers have to go beyond that. They have to focus on
understanding users, their needs, and how they will interact with the product
and how the product can seamlessly meet those needs
They also have to interview users, create user personas, review paper prototypes
with users, and observing usage of actual software.

e) *Iteration Demo* is one of the good practices that help the XP team and clients to collaborate efficiently and effectively. Name three (03) other similar practices in XP.

(2*3=6 marks)

ANSWER IN THIS BOX
Maintaining trust
Sitting together
Real customer involvement
A ubiquitous language
Stand-up meetings
Coding standards
Reporting

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