NANYANG TECHNOLOGICAL UNIVERSITY

SEMESTER 1 EXAMINATION 2021-2022

CE2006/CZ2006 – SOFTWARE ENGINEERING

Nov/Dec 2021   Time Allowed: 1 hour

INSTRUCTIONS

1.   This paper contains 2 questions and comprises 3 pages.

2.   Answer **ALL** questions.

3.   This is a closed-book examination.

4.   Both questions carry equal marks.

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1.   (a)   Is *include* use-case *merely* a mechanism provided by UML to split a use-case into smaller use-cases – Yes, or No? State your reasons. [Hint: think in terms of software reuse.]

(16 marks)

       (b)   Draw a State Machine Diagram to document the behavior of the Stack data structure:

               A stack is a data structure that supports only Last-In-First-Out (or First-In-Last-Out) strategy for inserting (Push operation) and removing (Pop operation) elements from it. The diagram should also show related error operations.

(14 marks)

Note: Question No. 1 continues on Page 2

(c)   Draw a sequence diagram using the following description:

LIBSYS is a library system which stores copyrighted articles. It provides functions for users to download and print copyrighted materials. There are four objects of classes involving in the interaction: Article, Form, Workspace, and Printer. When a user requests for an article, the action will trigger a request for a copyright form. Once the user has completed the form, the article is downloaded and sent to the printer. Once the printing is completed, the article is deleted from the LIBSYS workspace.

(17 marks)

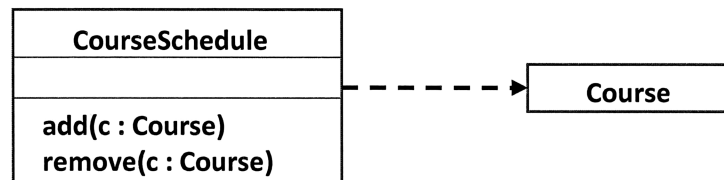(d)   What is the relationship that the following diagram (Figure Q1d) depicts?

Figure Q1d

(3 marks)

2.   (a)   Dissatisfaction with the overheads involved in software design methods of the 1980s and 1990s led to the creation of agile methods. What are the fundamental premises of such methods?

(12 marks)

Note: Question No. 2 continues on Page 3

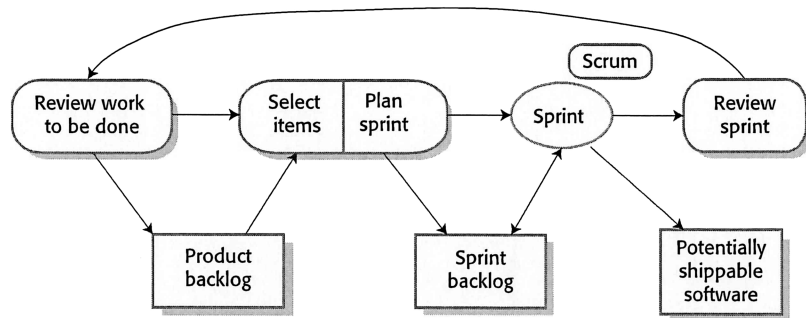(b)   The following diagram (Figure Q2b) depicts the Scrum sprint cycle.

Figure Q2b

Briefly describe the steps through the Scrum sprint cycle.

(14 marks)

(c)   What are the key properties of a product backlog that enable the dynamicity of the Scrum method?

(16 marks)

(d)   The total size (in points) of a list of product backlog items is 128. The Scrum Team consists of Product Owner, Scrum Master and six members in the Development Team. The cost of each member in the Scrum Team for each Sprint is $4K. Eight Sprints is determined to be needed to complete the project. Calculate the velocity and cost of this project.

(8 marks)

END OF PAPER

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Please read the following instructions carefully:

1. **Please do not turn over the question paper until you are told to do so. Disciplinary action may be taken against you if you do so.**

2. You are not allowed to leave the examination hall unless accompanied by an invigilator. You may raise your hand if you need to communicate with the invigilator.

3. Please write your Matriculation Number on the front of the answer book.

4. Please indicate clearly in the answer book (at the appropriate place) if you are continuing the answer to a question elsewhere in the book.