The University of Nottingham Ningbo, China

School of Computer Science

A Level 1 Module, Spring Semester 2021-2022

INTRODUCTION TO SOFTWARE ENGINEERING (AE1FSE-COMP1035)

Time Allowed: ONE HOUR

Candidates may complete the front cover of their answer book and sign their desk card but must NOT write anything else until the start of the examination period is announced

Answer ALL 10 questions

Total Marks Available: 50

No calculators are permitted in this examination

Dictionaries are not allowed with one exception. Those whose first language is not English may use a standard translation dictionary to translate between that language and English provided that neither language is the subject of this examination. Subject-specific translation dictionaries are not permitted.

No electronic devices capable of storing and retrieving text, including electronic dictionaries, may be used.

DO NOT turn examination paper over until instructed to do so

ADDITIONAL MATERIAL: None

INFORMATION FOR INVIGILATORS:
Collect both the exam papers and the answer booklets at the end of the exam.

SECTION A

Section A carries a total of 30 marks

Question 1

A software process is a sequence of activities that leads to the production of a software product. Describe, in bullet points, **FOUR** fundamental activities that are common to all software processes. (4)

Question 2

The need for early commitment and system rework when changes are made means that the waterfall model is only appropriate for some types of system. Describe and explain **THREE** types of the system. (6)

Question 3

a. Read the following scenario, then identify and explain **THREE** aspects of the project in which Agile may be harmful for the project.

   You work in a software development company that builds management applications, requiring different framework each time. You must plan a project for a new attendance monitoring application for Nottingham University that connect servers from three campuses (England, China, and Malaysia). The application is designed for three types of users: students, teachers, and administrators. The university IT manager and three types of users, from three campuses and from different faculties, will work closely with you. They have a plan for what they want the full software to do, but Malaysia campus has their own requirement in software design that is different with other campuses. In general, all three campuses expect the software can be fully deployed within 3 months with no overbudget spent. (6)

b. In this project, you as the developer, want to work with the teachers (stakeholders) in the software development throughout the software engineering phases. Describe and elaborate **TWO** different ways that you could involve them in the process based on Agile methodologies. (4)

Question 4

Explain which **TWO** types of requirements are particularly effective to be discovered using Ethnography with an example each. (4)

Question 5

You have been asked to develop a system that will help with large-scale events and parties such as weddings, graduation celebrations and birthday parties. Using an activity diagram, model the process context for such a system that shows the activities involved in planning a party (booking a venue, organising invitation, etc.) and the system elements that might be used at each stage. (6)

SECTION B

Section B carries a total of 10 marks

Question 6

List down **THREE** rules of Test Driven Development. (6)

Question 7

A simple login screen of a web application will be tested for seamless user login. The login screen has two fields, username and password as an input and the output will be to enable access to the system. The testing method will check the input and output as the following:

- Access to the system is granted if the user enters an existing username and the correct password.
- An error message is displayed if the user enters an existing username and an incorrect password.

What is the type of the testing method used above and why? List at least **TWO** of its benefits. (4)

SECTION C

Section C carries a total of 10 marks

Mayden is a small and successful U.K. company that develops managed Web applications for the health care sector. They specialize in flexible, cloud-based software, delivered by a team of 44 from two locations in England. Since 2014, Mayden has built a track record of delivering value to its customers with applications that have the power to change the way that services are delivered by health care staff - and experienced by patients. The company did have a reputation for being responsive to customer needs, but it tried to execute within a traditional project management environment. CEO Chris May explains the problems that surfaced as a result of trying to be flexible in a Waterfall environment: "Our best-laid plans were continually being hijacked for short-priority developments. The end result was that we reached a point where we had started lots of things but were finishing very little." Fortunately, Mayden recognized that the situation wasn't ideal. When an opportunity to develop a brand-new product with brand-new technology presented itself, the staff was enthusiastic about trying a new approach. While there was some discussion of hybrid project execution approaches, the decision quickly came down to using Scrum or continuing with the traditional Waterfall-based method that the organization had in place.

Question 8

What is Scrum? (2)

Question 9

Why the current situation in Mayden is not ideal? (4)

Question 10

If you were the CEO of Mayden, which approach will you choose for the brand-new product and why? (4)