

## **WARNING**

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Family Name					
Given Name/s					
Student Number					
Teaching Period	Semester 2, 2018				

<b>PRT452 – Software Engineering: Process and Tools</b>	<b>DURATION</b>	
	Reading Time:	<b>10 minutes</b>
	Writing Time:	<b>180 minutes</b>
<b>INSTRUCTIONS TO CANDIDATES</b>		
The examination has 2 sections		
<b>Section A:</b>	<b>Short Answer Questions:</b> Answer ALL 5 questions	
Suggested Time:	80 minutes (25 marks)	
<b>Section B:</b>	<b>Short Essay Questions:</b> Answer ALL 3 questions	
Suggested Time:	100 minutes (25 marks)	
<p>Note that questions <b>ARE NOT</b> of equal value.                  Read <b>ALL</b> questions carefully.                  Do not commence writing until instructed to do so.</p>		
<b>EXAM CONDITIONS</b>		
<p><b><u>You may begin writing from the commencement of the examination session.</u></b> The reading time indicated above is provided as a guide only.</p>		
This is a RESTRICTED OPEN BOOK examination		
No calculators are permitted		
One A4 sheet of handwritten double-sided notes permitted		
Hard copy, unannotated English translation dictionary only		
<b>ADDITIONAL AUTHORISED MATERIALS</b>	<b>EXAMINATION MATERIALS TO BE SUPPLIED</b>	
No additional printed material is permitted	1 x 20 Page Book 1 x Scrap Paper	

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## Section A

### Short Answer Questions

**Total No of Marks for this section: 25**

This section should be answered in the Answer Booklet provided.

Marks for each question are indicated.

Suggested Time allocation for Section A: 80 mins

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#### Question 1

Defend the view that agile methods are far more able to deliver high customer and worker satisfaction than their traditional counterparts.

(3 marks)

#### Question 2

The method below shows some unspecified dice game class that 'throws' a couple of dice and returns the result.

```
public int getScore()
{
    int result;
    result = (int) (Math.random() * 6) + 1;
    dice[0].setFaceValue(result);
    result = (int) (Math.random() * 6) + 1;
    dice[1].setFaceValue(result);
    int score = dice[0].getFaceValue() +
        dice[1].getFaceValue();
    return score;
}
```

a) What code smell does the above code have? (List 2)

(1 mark)

b) What type of refactoring can be taken to improve this code based on your answer to part a?

(1 mark)

c) Refactor this code. You can use any programming language you are familiar with.

(3 marks)

### Question 3

The computer will think of a random number from 1 to 20, and ask you to guess it. The computer will tell you if each guess is too high or too low. You win if you can guess the number within six tries.

```
1. # This is a guess the number game.
2. import random
3.
4. guessesTaken = 0
5.
6. print('Hello! What is your name?')
7. myName = input()
8.
9. number = random.randint(1, 20)
10. print('Well, ' + myName + ', I am thinking of a number between 1 and 20.')
11.
12. while guessesTaken < 6:
13.     print('Take a guess.') # There are four spaces in front of print.
14.     guess = input()
15.     guess = int(guess)
16.
17.     guessesTaken = guessesTaken + 1
18.
19.     if guess < number:
20.         print('Your guess is too low.') # There are eight spaces in front of print.
21.
22.     if guess > number:
23.         print('Your guess is too high.')
24.
25.     if guess == number:
26.         break
27.
28. if guess == number:
29.     guessesTaken = str(guessesTaken)
30.     print('Good job, ' + myName + '! You guessed my number in ' + guessesTaken + ' guesses!')
31.
32. if guess != number:
33.     number = str(number)
34.     print('Nope. The number I was thinking of was ' + number)
```

a) Devise all possible unit test cases for the program above.

(6 marks)

b) Based on your answers to part a, insert additional lines of code to improve the above program. You can use any programming language you are familiar with.

(4 marks)

### Question 4

Critically examine whether software project management differs from the management of projects in other sectors of society.

(4 marks)

### Question 5

Recommend some of the most important things that you will look out for when reviewing another team member's code. Give reasons to support your recommendations.

(3 marks)

## Section B

### Short Essay Questions

**Total No of Marks for this section: 25**

This section should be answered in the Answer Booklet provided.

Marks for each question are indicated.

Suggested Time allocation for Section A: 100 mins

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#### Question 1

When you are assessing a legacy system, you have to look at it from a business perspective and a technical perspective. From a business perspective, you have to decide whether the business really needs the system. From a technical perspective, you have to assess the quality of the system and its related support software and hardware. You then use a combination of the business value and the system quality to take one of the following informed decisions: scrap the system, re-engineer the system, replace the system, and continue the system's maintenance.

Your task is to assess legacy systems in your organization and decide what would be the most appropriate strategy for maintaining these systems.

- a. What possible factors you would use when assessing the technical quality of the legacy system. Give reasons to support your answers.

(3 marks)

- b. Assume that you assessed four systems and the results of the assessment are as follows:

- System A: high quality, low business value
- System B: high quality, high business value
- System C: low quality, low business value
- System D: low quality, high business value

What would be your recommendations for each of these systems? Justify your decisions.

(4 marks)

## Question 2

A computer company is working on an integrated control system for a national shoe manufacturer. The system will gather sales information daily from shoe stores nationwide. This information will be used by the accounting, shipping, and ordering departments to control all of the functions of this large corporation. A quality assurance software engineer suspects that the auditing functions of the system are not sufficiently tested, although they have passed all its contracted test suites. She is being pressured by her employers to sign off on the software. Her employers say they will go out of business if they do not deliver the software on time. She signs off.

Give 5 comments or concerns that you might have on the scenario above. Suggest 5 other possible approaches that she could have taken.

(10 marks)

## Question 3

The Pizza Ordering System allows the user of a web browser to order pizza for home delivery. To place an order, a shopper searches to find items to purchase, adds items one at a time to a shopping cart, and possibly searches again for more items. When all items have been chosen, the shopper provides a delivery address. If not paying with cash, the shopper also provides credit card information. The system has an option for shoppers to register with the pizza shop. They can then save their name and address information, so that they do not have to enter this information every time that they place an order.

Use Test Driven Development (TDD) to create the above system. You will need to show the relevant test cases. You can use any programming language that you like or just show the pseudocode.

(8 marks)