

2020 Examination Package - Trial Examination 5 of 7

STUDENT NUMBER

Figures

Words

Letter

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SOFTWARE DEVELOPMENT

Unit 3 & 4 – Written examination

(TSSM's 2017 trial exam updated for the current study design)

Reading time: 15 minutes

Writing time: 2 hours

QUESTION AND ANSWER BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of marks
A	20	20	20
B	4	4	20
C	9	9	60
Total			100

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- A scientific calculator is permitted in this examination.

Materials supplied

- Question and answer book of 18 pages.

Instructions

- Print your name in the space provided on the top of this page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic communication devices into the examination room.

SECTION A – Multiple-choice questions

Instructions for Section A

Answer **all** questions in section A.

Choose the response that is **correct** or that **best answers** the question.

A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

Use the following information to answer Questions 1 to 3

Alice has never been comfortable with technology and she is looking for a simple app for her iPhone, which will display the number of the steps completed, kilometres walked/jogged and calories burnt during the activity. The program will store the data and therefore Alice will be able to monitor the history of her activities.

Question 1

What would be the main non-functional requirements of this program?

- A. Ease of use, response rate
- B. Robustness, maintainability
- C. Response rate
- D. Display the total number of steps

Question 2

The data type for ‘*number of steps*’, ‘*kilometres*’ and ‘*calories*’ respectively would be:

- A. float, float and float
- B. float, float and integer
- C. integer, integer, float
- D. integer, float, float

Question 3

Conventionally, the index to the start of an array is:

- A. 0
- B. 1
- C. Undefined
- D. Any number, if it is defined

SECTION A - continued

Question 4

Which of the following data is an example of an integer data type?

- A. -25
- B. 14.52
- C. Twenty
- D. 3rd

Question 5

Power failure is an example of:

- A. An Event – based threat
- B. An Accidental Threat
- C. A Deliberate threat
- D. A System threat

Question 6

Which of the following best describes the Analysis stage of the PSM?

- A. Examination of the current system to determine the issues and how they can be solved.
- B. The writing of functional and non-functional requirements.
- C. Data collection to determine the current situation.
- D. A process that can be completed at any stage of the PSM.

Question 7

Which of the following control structures refer to iteration?

- A. If... Then – For Next
- B. For... Next – While...Do
- C. Action 1, Action 2, Action 3
- D. Repeat... Until - If... Then

SECTION A – continued
TURN OVER

Use the following information to answer Questions 8 and 9.

For Count $\leftarrow$ first to last
Action 1
Action 2
Next Count

Question 8

Which data structure uses the operations of 'push' and 'pop'?

- A. Queue
- B. Associative Arrays
- C. Stacks
- D. Linked Lists

Question 9

Which control structures are present in the algorithm?

- A. repetition and selection
- B. sequence and selection
- C. reiteration
- D. iteration and sequence

Question 10

A selection sort will perform a number of comparisons. How can the number of passes and swaps be represented?

- A. n^2 passes and n^2 swaps
- B. $n-1$ passes and $n-1$ swaps
- C. n^2 passes and $n-1$ swaps
- D. It cannot be determined

Question 11

How many swaps would be required to sort the following array using selection sort?

{3 - 6 - 2 - 4 - 5 - 7 - 6 - 1}

- A. 8 swaps
- B. 7 swap
- C. 9 swaps
- D. 6 swaps

SECTION A - continued

Question 12

The analysis stage of the PSM must consider:

- A. processes, users, digital system and data
- B. networks, procedures, information and users
- C. hardware, processes and data
- D. stakeholders, processes, hardware and data

Question 13

Louise finished a module of code that accepts four numbers and returns the sum as output. This is known as a:

- A. Function
- B. Procedure
- C. Sequence
- D. Method

Question 14

Programming languages vary depending on the amount of translation that is required for turning the language to binary code. This process is called:

- A. translation
- B. coding
- C. parsing
- D. compiling

Question 15

Which of the following diagrams has 'levels'?

- A. Context Diagrams.
- B. DFD Diagrams.
- C. Use Case Diagrams.
- D. Network Diagrams.

Question 16

A developer needs to evaluate the efficiency of a new information system. Which of the following criterion measures efficiency?

- A. The accuracy of the output has increased.
- B. The processing time has decreased by 40%.
- C. The number of complaints has reduced.
- D. The output produced is clear and relevant to the system.

SECTION A – continued
TURN OVER

Question 17

What does the term 'specification creep' refer to?

- A. When tasks take longer than expected to complete.
- B. When milestones must be pushed out because the tasks are taking longer.
- C. A lack of software integration which may lead to problems occurring.
- D. When clients add new features to the requirements during the development stage.

Please refer to the following paragraph to answer questions 18 and 19

A traditional school is in the process of implementing a new learning management system for students, teachers and parents. There has been forward planning, and a timeline to introduce this package in a phased method. The project managers have emphasised the fact that some staff members still have limited skills in the use of technology as they only use their laptops for word processing, research and students' reports.

Question 18

What would the limited skills in the use of technology be known as?

- A. A constraint
- B. A non-functional requirement
- C. A functional requirement
- D. The scope of the solution

Question 19

In a software requirements specification (SRS), which section would include details of the staff's IT skill level?

- A. The introduction
- B. The description of the proposed software solution
- C. The specific requirements of the software solution
- D. The description of the environment in which the solution will operate

Question 20

*'Enter an even number
enter an odd number
multiply the two numbers and display the output'.*

This is an example of:

- A. a message
- B. a line of code
- C. an algorithm
- D. selection

END OF SECTION A

SECTION B - Short-answer questions

Instructions for Section B

Answer **all** questions in the spaces provided.

Question 1 (6 marks)

a. What does the agile and waterfall process look like? Draw them.

2 marks

Agile model

Waterfall model



b. Explain the difference between the agile and the linear model

4 marks

SECTION B – continued
TURN OVER

Question 2 (4 marks)

James has just designed the first screen of a registration form for a training program. The diagram below shows a section of it.

The diagram shows a registration form section with three input fields, each highlighted with a light pink background. Each field contains the following elements from top to bottom: a label followed by a red asterisk (*), a grey placeholder text 'Your answer', and a red error message 'This is a required question'.

- First Name ***
Your answer
This is a required question
- Surname ***
Your answer
This is a required question
- Mobile Number ***
Your answer
This is a required question

- a.** What is a validation technique? 1 mark

- b.** What is the name of the validation technique used according to the diagram? 1 mark

SECTION B – Question 2 - continued

SOFTWARE DEVELOPMENT EXAM

c. What other validation technique could have James applied? 1 mark

d. How does validation differ from testing? 1 mark

Question 3 (4 marks)

```
Start
i ← 1
While i < 9
    print (i)
    i ← i + 1
End While
Stop
```

a. Which control structures can be identified? 1 mark

b. How many times does it loop? 1 mark

c. Which is the value of i after the first and last loop? 2 marks

SECTION B - continued
TURN OVER

SOFTWARE DEVELOPMENT EXAM

Question 4 (6 marks)

How do viruses hide from anti-virus software? List and explain two techniques.

Technique 1: _____

Technique 2: _____

3 x 2 = 6 marks

END OF SECTION B
TURN OVER

SECTION C – Case study

Instructions for Section C

Please remove the insert from the back of this book during reading time.
Use the case study provided in the insert to answer the questions in this section.
Answer all the questions in the spaces provided.

Question 1 (6 marks)

Identify three data collections methods Matt could have used during the analysis of the system?
Justify the appropriateness of each collection method for determining the functional and non-functional requirements.

Collection Method 1: _____

Collection Method 2: _____

Collection Method 3: _____

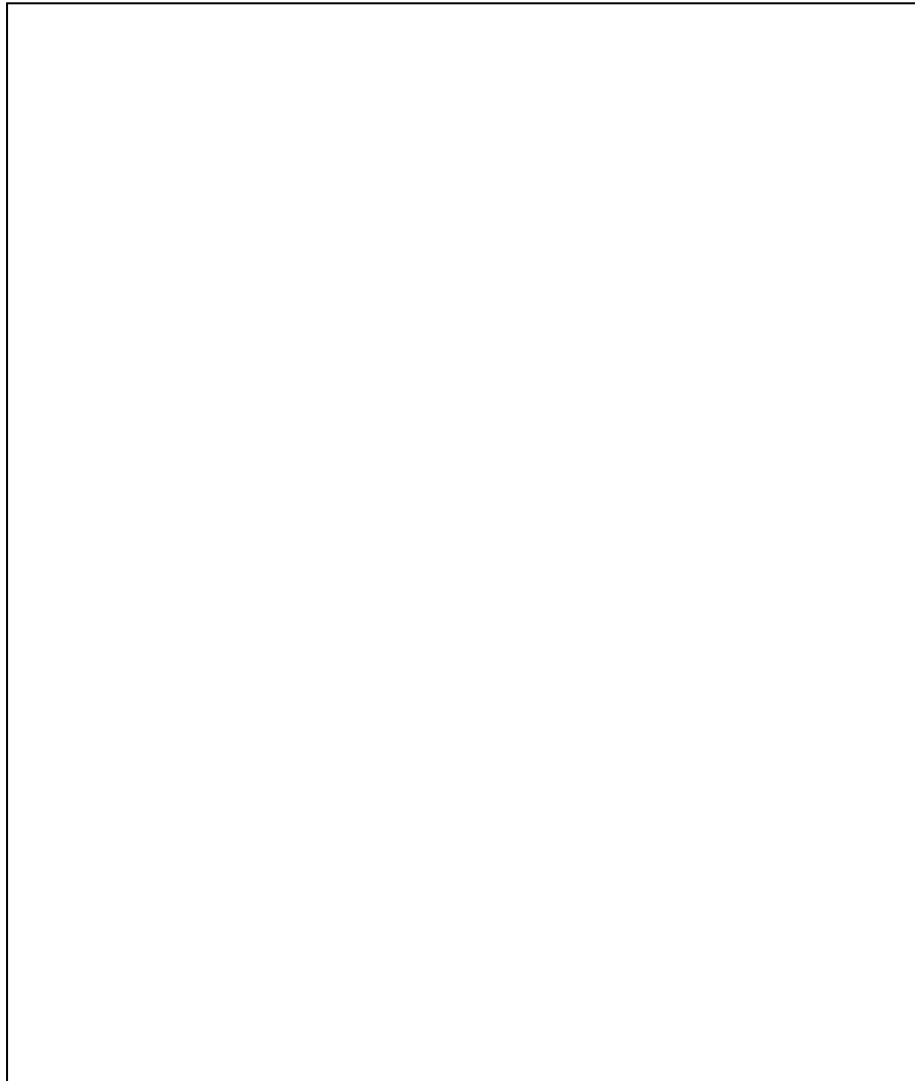
SECTION C – continued
TURN OVER

SOFTWARE DEVELOPMENT EXAM

Question 2 (15 marks)

Matt is in the process of preparing a use case diagram for the online booking of an event. Draw a UCD, following the proper conventions and identify:

- Five actors
- Four use cases
- Two <<include>>
- Four associations



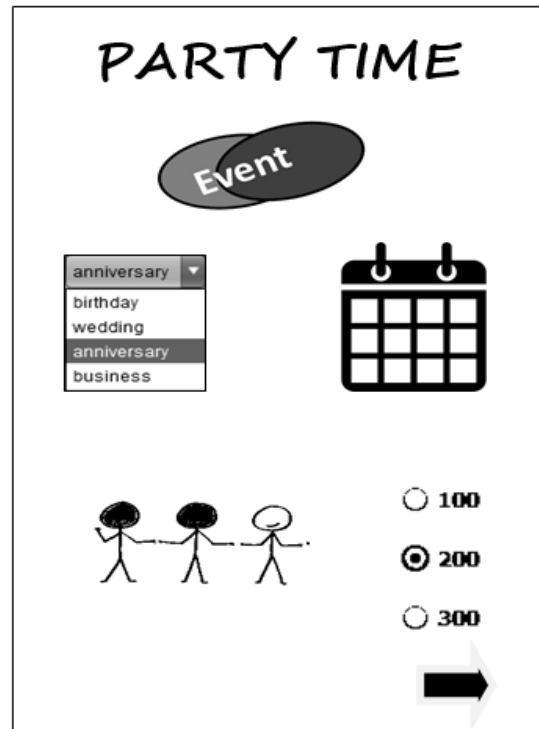
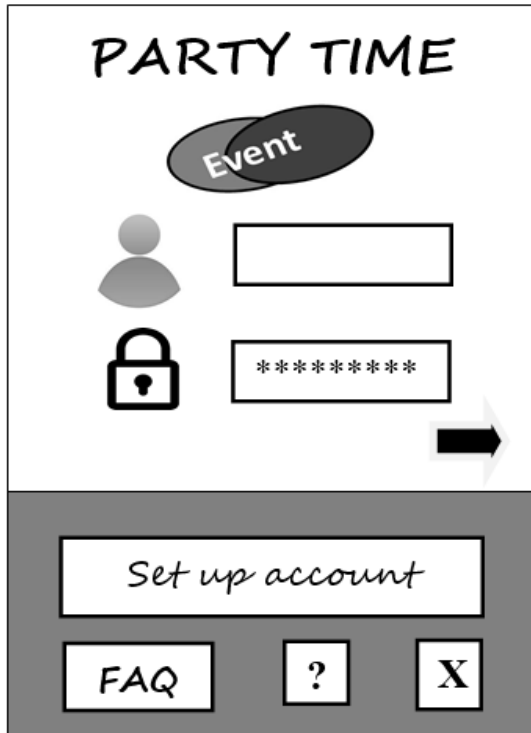
SECTION C – continued

Question 3 (15 marks)

Matt has designed a login screen and a data entry interface. Matt believes Nicole will love these modern designs.

Login screen

Data entry interface



- a. Explain one feature of the design that contributes to the efficiency of the solution.

2 marks

- b. Explain one feature that contributes to the effectiveness of the solution.

2 marks

SECTION C – Question 3 – continued

TURN OVER

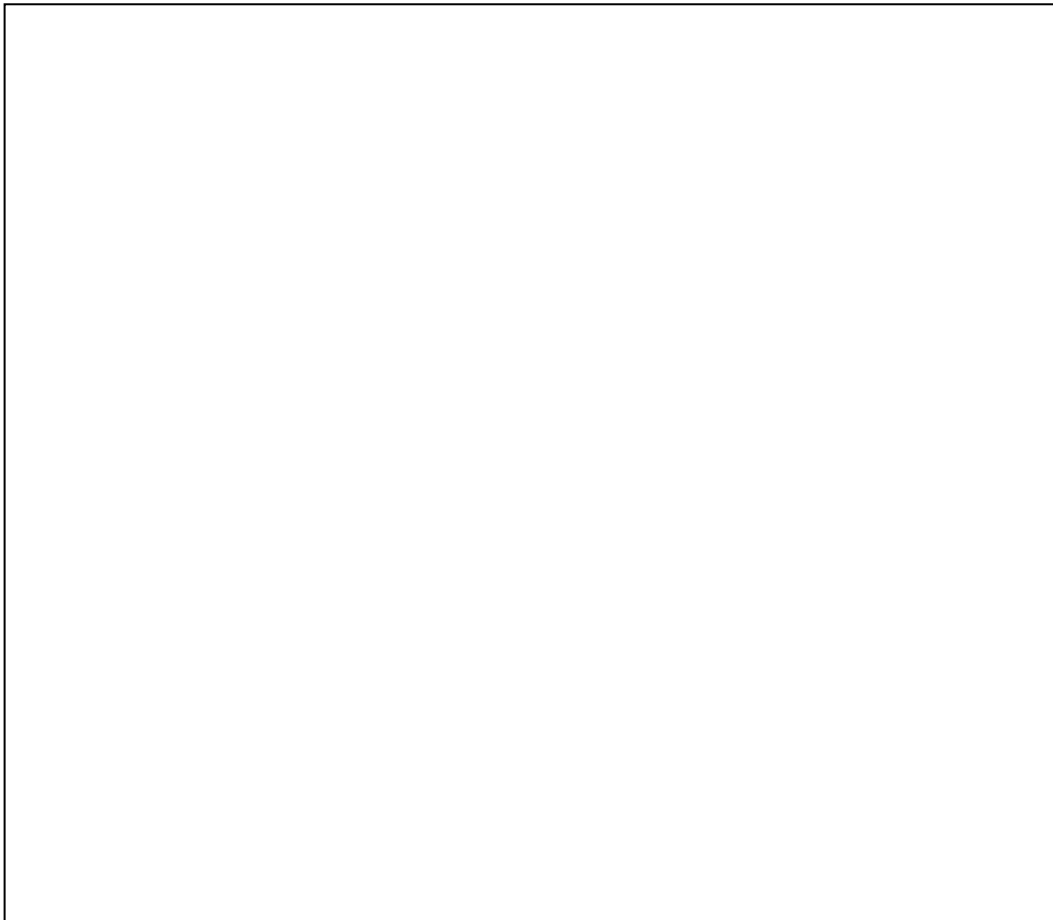
SOFTWARE DEVELOPMENT EXAM

- c. Suggest two improvements for these designs. Justify your recommendations.

2 marks

- d. Produce an alternative mock-up for the data entry screen. This layout of the proposed screen should convey the look and functionality of the screen. Annotate all the objects used.

5 marks



SECTION C – Question 3 – continued

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- e. How would you measure the efficiency and effectiveness of your design? Identify one criterion for efficiency and one for effectiveness. 4 marks

Efficiency criterion: _____

Effectiveness criterion: _____

Question 4 (4 marks)

Discuss two non-functional requirements that Matt will have to pay attention to when developing this portal.

Non-functional Requirement 1: _____

Non-functional Requirement 2: _____

SECTION C – continued
TURN OVER

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Question 5 (2 marks)

Matt will structure the clients' files in XML files. Name two advantages of doing this.

Question 6 (1 mark)

State one goal of 'Party Time'

Question 7 (3 marks)

Which Software development model will best suit the need of Nicole's business? Why?

SECTION C – continued

Question 8 (10 marks)

Matt has finished the development of the required solution. He is now having a conversation about usability testing with Nicole. Could you define usability testing and the steps involved for the same?

Question 9 (4 marks)

Matt is planning to not back up the data to a cloud storage. Explain why it is not safe to do so.

END OF QUESTION AND ANSWER BOOK

INSERT FOR SECTION C - CASE STUDY

Please remove from this book during reading time.

‘Party Time’

Nicole has always been interested in overseeing and planning parties. She graduated as an event manager in 2014 and worked for the Victoria Market organising the Wednesday night market and other extravagant events for big businesses. After gaining experience in this area, she decided to set up her own business, named ‘Party Time’. This business has been running for a whole year now and she is ready to expand. Her main goal is to provide the best service possible for her clients. She wants her clients to remember the event as a fun, unique, memorable, social and a well-organised occasion.

Nicole sees each individual event as a project and allocates a sole point of contact, the supervisor, who deals with the client’s requirements in preparation of the event. The supervisor works under Nicole’s leadership to plan the budget and deliver an extraordinary time for her clients and guests. The supervisor deals with suppliers that deliver the freshest and tastiest food, designed specifically for the events. She focuses on the client’s requirements of design and themes, which includes lighting, furniture, centrepieces, floral displays, video recording and photographs.

Event staff will be responsible for the successful delivery and implementation of various event components under the direction and supervision of the event manager.

So far ‘Party Time’ hosts a static website which contains information about their business, where prospective clients can read about their services. The site also has a gallery of video clips and photographs of events they have organised. Nicole is aware that her information system is in need of some changes and therefore she asks Matt Weks, who works for ‘Technology Solutions’, to oversee the revamping of the site. She has requested ‘Technology Solutions’ to have Matt Weks work onsite with her team to gauge the need of her business and give him an opportunity to work with the business supervisors and other stakeholders of the business.

Nicole is interested in the creation of a portal where clients, supervisors and staff members will be able to log in the system and collaborate in the preparation of the event. The portal will allow clients to log on, upload and submit their requirements with ease and at any time. Afterwards, the supervisor presents the plan to Nicole who approves or updates it if required. The use of this portal will ensure accuracy of documentation and save time for both the clients and the organiser. The camera person and photographer will be able to upload the images and video recording of the event as well. After the event, Nicole’s assistant will sort and select the best images and video sections for the clients to view.

Before accessing the portal, clients, duty managers and event manager will create an account to login. Clients will enter all special dietary requirements to ensure the business caters for all guests accordingly. Online registration should be a simple, cost effective and stress-free solution. The registration system should be easy-to-administer and feature a secure credit card payment facility.

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