SOFTWARE DEVELOPMENT

Units 3 & 4 – Written examination

TSSM™
Creating VCE Success

(TSSM's 2018 trial exam updated for the current study design)

SOLUTIONS

SECTION A – Multiple-choice questions

Question 1
Answer: B

Explanation:

Comments are written into the program's code to assist interpreting complex coding, describe the function of key variables and procedures.

Question 2
Answer: D

Explanation:

Non-functional requirements are related to the characteristics of the software solution.

Question 3
Answer: A

Explanation:

Efficiency measures are related to ease of use to enter data, how quickly the data is entered and processed and how well the functions of the user interface do the tasks they have been assigned.

Question 4

Answer: B

Explanation:

Object Description tables show the object names and the events they are connected to in the software solution.

Question 5

Answer: A

Explanation:

The analysis stage is where the information system is investigated to determine what constraints may be placed upon it.

Question 6

Answer: D

Explanation:

Linear searching examines each element in the array to match it to a predefined value.

Question 7

Answer: C

Explanation:

A number of laws will restrict the use of data and how it is secured in an information system.

Question 8

Answer: A

Explanation:

A trace table is used to test algorithms to make sure that logic errors do not exist in the algorithm.

Question 9

Answer: C

Explanation:

No SDLC model other than the waterfall model follows a linear approach. For instance, with the Agile model developers go through each iteration of the PSM life cycle by taking feedback from the client and implementing the same at the beginning of each iteration.

Question 10

Answer: B

Explanation:

An event-based threat is beyond the control or influence of security planning. No organisation can have control of acts of nature, power failure or files getting corrupted without any input.

Question 11

Answer: C

Explanation:

Quick Sort as an algorithm uses the 'Divide and Conquer' technique, where the array divided at the pivot and the sort algorithm is performed on each sub array.

Question 12

Answer: A

Explanation:

Project Management includes identifying tasks and their timeframe, monitoring tasks, allocating resources and people to complete tasks and an overall time frame for the entire project.

Question 13

Answer: C

Explanation:

A rectangle is drawn around all the use case symbols to represent the boundary/confines of the system.

Question 14

Answer: D

Explanation:

Context Diagram gives a simpler view of the system, it does not include any internal processes.

Question 15

Answer: B

Explanation:

Phone contains brackets, symbols etc so a string is most appropriate.

Question 16

Answer: A

Explanation:

XML describes/defines data in a file. XML is a language that uses custom tags instead of pre-defined tags like HTML

Question 17

Answer: D

Explanation:

The condition is at the start of the loop while condition a>9.

Question 18

Answer: C

Explanation:

Designing for all screen sizes and taking into the account the capacity of devices is scalable.

Question 19

Answer: A

Explanation:

Accessibility of a solution is concerned with ensuring that the solution caters for those with disability such as vision impairments.

Question 20

Answer: B

to develop system scope &…

Explanation:

A modelling language in software development to provide a standard way to visualise the design of a solution.

SECTION B - Short-answer questions

Question 1 (2 marks)

A SRS documents the analysis of an information problem. It forms an agreement between the client and the developer as to exactly what needs to be made so that the design stage can start.

Question 2 (2 marks)

The scope defines what the boundaries of the software solution will be. It also identifies what the solution will do and not do.

Question 3 (2 marks)

It makes debugging code easier. It also assists future developers when maintaining the code.

Question 4 (2 marks)

In the design stage, validation involves how data will be coded, processed and output. In the development stage, it involves preventing and trapping errors and determining if data input is reasonable.

Question 5 (2 marks)

Boundary conditions which are the extremes of input eg. maximum, minimum, in between, outside the range and error values. Boundary testing helps the software analyst in many ways including but not limited to:

- Clarify and identify gaps in the requirements.
- Provide coverage for conditional statements.
- Prevent mistakes arising from using the wrong comparison operator

Question 6 (2 marks)

Screen size is the physical size of the screen; its length and width. Screen resolution comprises the density of the pixels in the screen, measured in dots per inch.

Any current phone example is acceptable for the example.

Question 7 (2 marks)

Usability testing is undertaken with real users to determine how easy the software solution is to use. Opinions from users about the navigation of the software are recorded and these changes are implemented before the final release of the software solution.

Question 8 (2 mark)

A project log is a daily log of what is happening on the project which keeps a record of problems, issues and progress. This record can also be useful for future projects to refer to and learn from.

Question 9 (2 marks)

Man-in-the-middle (MITM) attacks are a type of eavesdropping attack, which occurs during data transmission. During this attack, an unauthorized third party intercepts the transmission between two users and obtains the information. The information is then changed and send across to either side of the transmission.

Question 10 (2 marks)

Any two from the following with correct explanation:

Syntax – errors in the spelling or grammar of the programming language

Logic – an error that causes the program to produce unexpected results

Run time – exceptions that occur when something happens that was not planned for causing the program to crash.

Overflow or underflow – the result of a calculation or process that causes a variable to become to large for the location in which it is stored.

Memory leak – when a program uses more memory than was allocated.

Stack overflow – a circular reference in the program quickly fills up the stack causing a program crash.

SOFTWARE DEVELOPMENT EXAM

SECTION C – Case Study
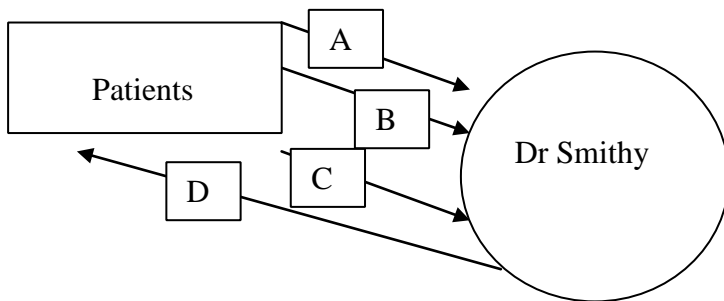
Question 1 (2 marks)

1 mark each

The organizational goal is providing Dr Smithy's patients with improved and more timely access to her services.

The information system objective is to provide secure booking and payment process for appointments.

Question 2 (4 marks)

Jason first wants to have an overview of the interaction between Dr Smithy and external entities. Complete the context diagram below.
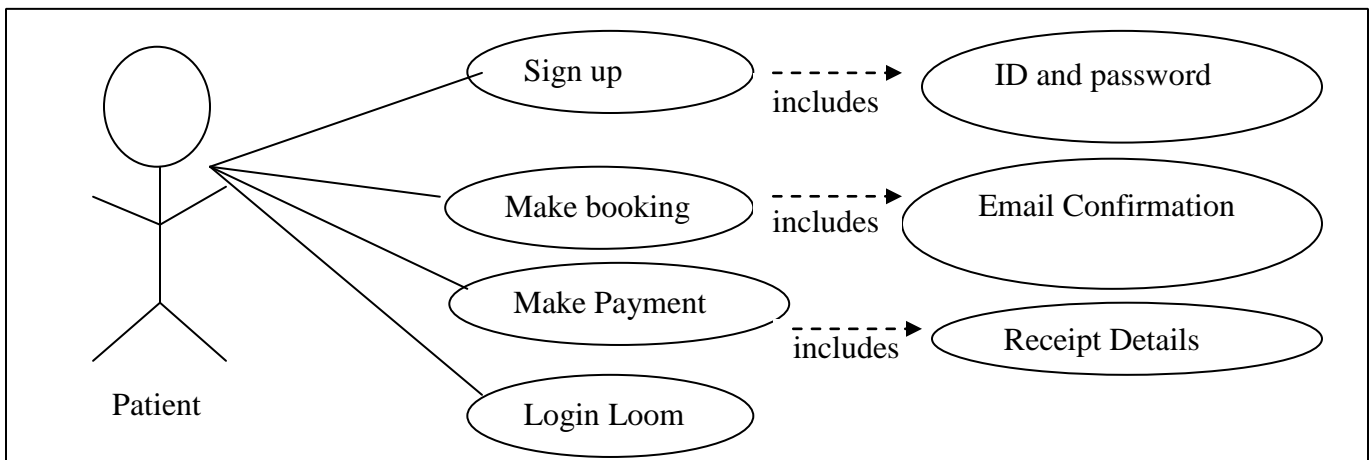

Similar data flows are acceptable to

those listed below 1 mark each:

    A Sign up data
    B Booking details
    C Payment details
    D Booking confirmation

Question 3 (7 marks)

 (1 mark @ use case)

Question 4 (2 marks)

1 mark each for technique and 1 mark for justification from either of the following:

Survey of patients – can be online or paper based for patients. They are easy to administer, and overall satisfaction is easily gauged.

Interviews of patients – provided richer qualitative data as those participating can be more engaged in the interview and respond well.

Question 5 (6 + 2 marks)

a. (6 marks 1 for each task correct in Gantt Chart).

	Days							
Task	5	10	15	20	25	30	35	40
1. SRS	█							
2. Coding		█	█	█	█			
3. Debug						█		
4.Test						█		
5.Implementation							█	█
6.User Documentation						█		

b. Task 1, 2, 3,5 (1 mark)

Question 6 (4 marks)

2 marks for two clear different techniques.

A project log is a daily log of what is happening on the project which keeps a record of problems, issues and progress. This record can also be useful for future projects to refer to and learn from.

Use of annotations in the Gantt Chart allows all tasks to be visually represented, resources allocated to each task and their progress monitored. This is very important to record any changes in resources, completion of tasks or changes to critical deadlines.

Question 7 (6 + 2 marks)

Array ID[ ]   Array Password[ ]

123456
234567
345678

goAt999za
1Gptree45
guJ54s15t

a.

> var i: integer *1 mark*
> FOR i = 0 to array length[ID] – 1   *1 mark*
>   IF ID = array[ID] THEN *1 mark*
>   Display Password[ID] *1 mark*
>   ENDIF *1 mark*
> ENDFOR
> Display "Password not found" *1 mark*

b.

> A linear search has been used as the array is not sorted in ascending order, so a binary search is not appropriate. The linear search examines each item in the lists in turn until the required ID and password has been found. It is easier to code and works well for small lists which seems to be the case for patient login details.
>
> 2 marks

Question 8 (4 marks)

2 marks for 2 clear and explained reasons

The potential risks and legal ramifications for offshore cloud storage are very serious. When data is stored in another country then it is susceptible to that country's privacy and confidentiality laws that may differ significantly from Australia's privacy laws. The potential for unauthorised access is greater which could result in a breech and a $1.7 million fine. Some countries such as the US can force a cloud storage organisation to hand over data, which again would breech our privacy laws. Some offshore locations can also be subject to sever weather or climate threats, which could result in data loss and downtime for Dr Smithy's business.

Question 9 (3 marks)

Answers should include (1 mark each)
When to perform a full and incremental backup
Backup Media
Archival and Disposal

Question 10 (4 marks)

2 marks for Act correctly identified and why it is breached. 2 marks for explaining how Dr Smithy and HealthDirect need to protect from the breech.

Spam Act 2003 prevents the sending of unsolicited commercial electronic messages which includes emails, sms, instant messaging etc. As Dr Smithy's patients have not given consent to allow HealthDirect to directly market to them then even one unsolicited commercial email to one of her patients would be considered spam therefore, breeching the Spam Act 2003. Dr Smithy would need to ask her patients for consent to pass on their details to HealthDirect to allow direct marketing to occur. In addition, HealthDirect would need to clearly identify themselves and any electronic contact to Dr Smithy's patients and include the ability for patients to remove themselves from their mailing list.

Question 11 (8 marks)

Accidental Threat 1 (1 mark)
    Deletion of data by Dr Smithy's family

Prevention 1 (2 marks)
        User names and passwords for the family + why suggested

Accidental Threat 2 (1 mark)
Privacy breach by family members who have inadvertently looked at patient data

Prevention 2 (2 marks)
File access restrictions + why suggested

Deliberate Threat 1 (1 mark)
    Hacking of Dr Smithy's website and payment processed

Prevention 1 (2 marks)
    Firewall + why suggested

Deliberate Threat 2 (1 mark)
Sniffing packets when Dr Smithy's sends data over the internet

Prevention 2 (2 marks)
Encryption + why suggested

Question 12 (2 + 2+ 2 marks)

Time Frame	Description	Measure of Efficiency & Effectiveness
		-
the software been installed		
3-6 months after the implementation of the website/soft	Feedback from: Patients via a survey	**Efficiency** - Is the software solution easy to use? **Effectiveness** - Is the correct information being produced by the software?