



Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

Complete, fold and seal
(see note 2 below)

SURNAME:

Harrison

FORENAME(S):

Andrew David

1	Student Number	172558
2	Title of Examination Paper	Software Development
3	Module Code	ACCA4017
4	Date and Time of Examination	09/01/2019 17:10
5	Examination Venue	642
6	Seat Number	
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1a	1
1b	1
1c	3
1d	4+5
2a	10
2b	1
2c	10
3a	5
3b	0
4a	6
4b	5
4c	6
Total	57

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195 ✓

601

1a) A queue data structure is a set of data which operates as a first in first out process where the first element will be used first then the next, etc. An application that uses this is a phone system in a call centre as calls are put into queues until someone is available.

b) A stack data structure is a set of data where the everytime an element is added it gets put on the top of the pile. But the top element is the one that gets used & removed like a stack of plates. This could be best used in card game as most of the time a dealer will pick up the top card, no matter if it's in order or not.

c) A recursive algorithm is a function where it calls itself directly or indirectly. Quicksort is a recursive algorithm where it uses divide & conquer to get similar advantages to a merge sort. Quicksort is actually as good as a merge sort under average running times, and it is significantly faster than a selection sort & insertion sort.

d) Object orientated programming (OOP) is a language that is based around objects and data. There are 4 concepts based around OOP: Inheritance, encapsulation, polymorphism & abstraction. So with OOP, you create classes to then have subclasses which can inherit features of it's parent class.

2 b)

3a) ~~Input~~ Output 'Insert a list of numbers:'

INPUT user inputs a list of numbers.

Store the user's numbers in the list variable.

While the algorithm checks ~~to~~ the numbers.
for an even number.

IF the number is even.
remove and then move onto the next
number.

ELSE ~~or~~ leave the number as it's not
an even number.

IF there were no even numbers.

Output 'No even numbers found' & then
Show the user the list.

ELSE

Output 'Here are the numbers without
the even numbers!'

4a1) The methods used in white-box testing are unit testing, ~~or~~ testing for memory leaks, creating test cases and running them & also to understand the source code. AS white-box testing is done internally.

2) The methods used for black-box testing are functional testing, non-functional testing & Regression testing. Functional testing is testing the functional requirements of a system. Non-functional testing is where it's testing the performance, scalability, usability, etc. Then regression testing is testing after any upgrades, patches or system maintenance to see if the code still works.

3) The methods used for grey-box testing are Matrix Testing, Regression testing, Orthogonal Array testing & pattern testing. Matrix testing involves all of the defined variables that exist in a program. Pattern testing is where the tests are performed on historical data and can determine why failures occurred.

6) Unit testing is a type of white-box testing where the developer cuts the program into the smallest testable parts which are called a unit. These units are individually tested for operation. This is normally an automated process. Within C# there is an automated tool called NUnit which is widely used across all .Net languages. A typical unit test has 3 phases which are: initializing a unit of code to test, then it calls a method on the code & then it observes the behaviour of the code. If it matches the expectations it passes.

c) Incremental development is a model where the product is designed, implemented & tested a little bit at a time until the product meets all of the requirements. An advantage of incremental development is that it's easier to manage as the risks & milestones are easier within a small iteration. A disadvantage is that each phase is very rigid & do not overlap each other.

Iterative development is a model which doesn't need a full requirement specification. It starts with a design and development of a limited part of the software. The iterative process means you can repeatedly expand and enhance the program until the whole system has been implemented & deployed. An advantage of this is less time is spent documenting and more of a design focus. A disadvantage could be that the system architecture could have issues due to a lack of a full specification.