

Qualification title: Level 3 Advanced Technical Extended Diploma in Digital Technologies (5220-32)

Exam name: 5220-035/535 Level 3 Digital Technologies
(Application Development) – Theory exam (2)

Exam date: 01 March 2018

Exam start time: 9:30

Exam finish time: 12.00

Base mark: 80

Q	Acceptable answer(s)	Guidance	Max mks	Ref
1	<p>1 mark for each requirement stated, maximum of 4 marks.</p> <ul style="list-style-type: none"> intended purpose (1) target platform (1) system constraints (1) project constraints (1) designs / artwork to be included (if present) (1) end user (1) 	Any of the following or any other reasonable answer	4	310-1.1 A01
1b	<p>2 marks for each explanation, maximum of 4 marks.</p> <p><u>Intended purpose</u> The primary, stated use of the proposed application (1) and any secondary use or proposed further development (1) of the application.</p> <p><u>Target platform</u> The software (operating systems) platform (1) on which the application is primarily designed to run on (1).</p> <p><u>System constraints</u> Any hardware / software limitations (1) such as processing power, memory or software architecture or any in-house / web or cloud based limitations (1) such as storage or bandwidth.</p> <p><u>Project constraints</u></p>	Any of the following or any other reasonable answer	4	310-1.1 A02

	<p>Impact of budget limitations (1) on the resources available to complete the project along with any lack of specialist skills (1) within the project team.</p> <p><u>Designs / artwork to be included</u> Availability of artwork that may be required (1) giving consideration to copyright and legal constraints (1) on all media files used.</p> <p><u>End user - current skill level</u> What are the current skill levels of the proposed end users (1) and what future training will be required (1) to enable them to correctly use the application.</p>			
2a	<p>1 mark for each stated, maximum of 2 marks.</p> <ul style="list-style-type: none"> • Interview (1) • Survey (1) • Direct questioning (eg recorded, documented) (1) • Market research (1) • Availability of off the shelf/vendor products (1) 	Any of the following or any other reasonable answer	2	310-1.1 A01
2b	<p>2 marks for each explanation, maximum of 4 marks.</p> <ul style="list-style-type: none"> • <u>Interview</u> Enables the opinions of existing or intended users (1) to be taken into account when considering the project. Interview offers the opportunity to gather user views in a less formal or structured environment (1). • <u>Survey</u> Enables a measurement of the current processes/opinions from a wide audience (1). The data collected can be analysed to help determine the project feasibility (1). 	Any of the following or any other reasonable answer	4	310-1.1 A02
3	<p>2 marks for each model described, maximum of 6 marks.</p> <ul style="list-style-type: none"> • <u>Waterfall</u> Is a sequential design process, in which progress is seen as flowing steadily downwards (like a waterfall) (1) through the phases of conception, initiation, analysis, design, construction, testing, production/implementation and maintenance, with each phase being completed prior to moving onto the next phase of the cycle (1). • <u>RAD (Rapid Application Development)</u> Is a type of incremental model, where the components are developed in parallel (1) as if 	Any of the following or any other reasonable answer	6	310-1.2 A02

	<p>they were mini projects. The developments are time constrained, delivered and then usually integrated into a working prototype (1).</p> <ul style="list-style-type: none"> • <u>Agile</u> Is a non-traditional type of Incremental model. Software is developed in small incremental releases (1) with each release building on previous functionality (1). Each release is thoroughly tested to ensure software quality is maintained. 			
4a	<p>2 marks for an explanation, maximum of 2 marks.</p> <p>A method is an algorithm which carries out a series of steps (1) whereas a function carries a series of steps and returns a value (1).</p>	Any of the following or any other reasonable answer	2	310-2.1 A02
4b	<p>2 marks for each explanation, maximum of 4 marks.</p> <ul style="list-style-type: none"> • <u>Pre-defines library functions</u> Are included as a part of the programming language or development environment (1) allowing them to be called or referenced without the need to add further code instructions (1). • <u>Coded</u> Created by the programmer (1) to carry out a specific purpose and are available to call only within the program in which they have been written (1). 	Any of the following or any other reasonable answer	4	310-2.1 A02
5	<p>1 mark for each type stated, maximum of 2 marks.</p> <ul style="list-style-type: none"> • String - Stores alphanumeric characters (1) • Boolean - Stores True or False only (1) 	Any of the following or any other reasonable answer	2	310-2.1 A01
6	<p>2 marks for each explanation, maximum of 6 marks.</p> <ul style="list-style-type: none"> • <u>Polymorphism</u> Is the provision of single interface (1) to entities of different types (1). For example, Polymorphism would allow the use of a single interface called USERID to represent either a numeric or alphanumeric value, with the programming determining the appropriate value in context. In practise, a school management system may use student numbers for login USERID whereas staff login with their forename and surname. 	Any of the following or any other reasonable answer	6	310-2.2 A02

	<ul style="list-style-type: none"> • <u>Inheritance</u> A class is based on another class (1) which allows it to access all of the members of its parent / super / base class (1) including data and methods. • <u>Encapsulation</u> Is used within a class to protect members of that class (1) by hiding members through the use of private scope access modifiers (1). 			
7	<p>2 marks for an explanation, maximum of 2 marks.</p> <p>A Data Flow Diagram (DFD) is a graphical representation of the flow of data (1) through an information system (1).</p>	Any of the following or any other reasonable answer	2	310-2.3 A02
8	<p>2 marks for an explanation, maximum of 2 marks.</p> <p>Pseudocode is a way of describing a computer algorithm (1) or program using a combination of natural language and programming language (1) without needing to follow the exact coding syntax of a particular programming language.</p>	Any of the following or any other reasonable answer	2	310-2.3 A02
9	<p>2 marks for each description, maximum of 4 marks.</p> <ul style="list-style-type: none"> • <u>Alpha Testing</u> Very early version testing (1) of a programme which may not be feature complete testing is usually carried out within the development team only (1). • <u>Beta Testing</u> The last stage of testing carried out with a limited number of external users (1) to gather information about usability and functionality (1). 	Any of the following or any other reasonable answer	4	310-3.1 A02
10	<p>2 marks for a correct explanation, maximum of 2 marks.</p> <p>The Test Log provides a detailed list of tests that were executed, and provides information relating to the success or failure of those tests (1). The test log also acts as an accurate audit trail, allowing post-execution diagnosis of failures to be undertaken (1).</p>	Any of the following or any other reasonable answer	2	310-3.2 A02
11a	<p>1 mark for each area stated, maximum of 2 marks.</p> <ul style="list-style-type: none"> • Feedback (1) • Test Results (1) • Recommendation for improvements (1) 	Any of the following or any other reasonable answer	2	310-4.1 A01

11b	<p>2 marks for each explanation, maximum of 4 marks.</p> <ul style="list-style-type: none"> • <u>Feedback</u> This will include feedback from both the client and end-users (1) that have been involved in the testing and should cover both positive and negative attributes of the program (1). • <u>Test Results</u> Should include both expected as well as actual results (1) along with any necessary corrections to the program and how they were implemented (1). • <u>Recommendation for improvements</u> Should include recommendations for functionality improvements to any future versions (1) of the software as well as additional functionality that might be incorporated into any future versions (1). 	Any of the following or any other reasonable answer	4	310-4.1 A02
12	<p>2 marks for each explanation, maximum of 6 marks.</p> <ul style="list-style-type: none"> • <u>Array</u> An array is a structure which can store multiple elements (1) where the element data types must be of a similar types of data (1). • <u>Struct</u> Is a data structure which can be instantiated to hold multiple variables (1) where each variable may be of a different type (1). • <u>Class</u> Are structures which can be instanced to hold multiple attributes and methods (1) and allow different levels of scope and protection (1) 	Any of the following or any other reasonable answer	6	310-2.2 A02
13	<p>1 mark for each reason stated, maximum of 2 marks.</p> <ul style="list-style-type: none"> • Allows Team members to understand the programmer's intentions (1). • Explains the use of a specific piece of code in practice (1). • Allows for more effective troubleshooting by a person that didn't create the original code (1). • If code is experimental, commenting allows for the purpose to be understood (1). 	Any of the following or any other reasonable answer	2	310-4.2 A01
14	<p>1 mark for each stated, maximum of 2 marks.</p> <ul style="list-style-type: none"> • If...else (1) • Switch() (1) 	Any of the following or any other reasonable answer	2	311/ 312/ 313 - 1.2 A01

15	<p>2 marks for an explanation, maximum of 2 marks.</p> <p>Indentation outlines sections of the code (1) so that is more easily read and understood (1).</p>	Any of the following or any other reasonable answer	2	311/ 312/ 313 - 1.2 A02															
16	<table><tr><th>Part</th><th>Guidelines</th><th>Marks</th></tr><tr><td>a</td><td>The total number of characters in the string or the value 40</td><td>1</td></tr><tr><td>b</td><td>The number of spaces/space characters in the string or the value 5</td><td>1</td></tr><tr><td>c</td><td>PRINT k + 1 on line 13</td><td>1</td></tr><tr><td>d</td><td>Record (1) the position of each space (1) in the string in an array (1) One mark for each item, maximum three marks</td><td>3</td></tr><tr><td>e</td><td>The following code or accept any reasonable answer: i = 1 </td></tr></table>		Part	Guidelines	Marks	a	The total number of characters in the string or the value 40	1	b	The number of spaces/space characters in the string or the value 5	1	c	PRINT k + 1 on line 13	1	d	Record (1) the position of each space (1) in the string in an array (1) One mark for each item, maximum three marks	3	e	The following code or accept any reasonable answer: i = 1
Part	Guidelines	Marks																	
a	The total number of characters in the string or the value 40	1																	
b	The number of spaces/space characters in the string or the value 5	1																	
c	PRINT k + 1 on line 13	1																	
d	Record (1) the position of each space (1) in the string in an array (1) One mark for each item, maximum three marks	3																	
e	The following code or accept any reasonable answer: i = 1																		

	<p>process descriptions may lack some cohesion but the description of the proposal is broadly effective.</p> <p>Band 3: 7- 9 marks</p> <p>Clear explanations are provided in the discussion for the correct identification of the first and last Forenames in the initial string. There are well-developed proposals for the identification of all names in the concatenated list using the STRINGPART function/method. The creation of the string array and assignment of all Forenames to it is fully and correctly discussed. The answer provided is logical and coherent.</p>			
--	---	--	--	--