BCS Level 4 Diploma in Software Languages
Answer Key and Rationale QAN 603/0545/9

Question	Answer	Explanation / Rationale	Syllabus Sections
1	D	Binary search is optimised for efficiently finding a value in an ordered set. https://en.wikipedia.org/wiki/Binary_search_algorithm	2.2
2	C	"Pattern recognition" involves finding the similarities or patterns among small, decomposed problems that can help us solve more complex problems more efficiently.	2.1
3	C	A bridge pattern decouples the abstraction from the implementation.	1.2
4	B	A library is a container of compiled code and resources. It isn't an element of the language.	2.3
5	A	A parameter is used in a method / function contract to describe data that can be passed in, hence this is how data can be passed into a method / function.	2.3
6	C	A stack operates a LIFO process. The apple is the only thing left after both banana and orange have been removed.	2.3
7	A	Abstraction involves filtering out. Essentially, ignoring the characteristics that we don't need, in order to concentrate on those that we do.	2.1
8	B	Although it may be necessary to undertake corrections as a result of tests, the 'maintenance' during development is different from the more formal maintenance once the software is live. However, maintenance requirements, as all non-functional requirements, need to be considered as part of design during the design stage, to ensure that the software developed can be maintained according to the requirements.	1.4
9	B	An action that a user should be able to perform with a system is an example of a 'Functional Requirement'.	1.3
10	C	Authentication is a means by which a user's identity can be corroborated.	1.5

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11	B	Both the statement and reason are true. Test design contains generic patterns that can be re-used, to verify common core aspects of applications, and focus more time on application specific unique aspects. Testing the operation of a program when faced with a wide variety of data (e.g. in different formats and edge-cases) may well reveal errors that wouldn't be spotted with more limited data.	1.6
12	C	Data design and process design are part of the physical software design, along with UI design.	1.1
13	B	Option a is a functional requirement, and option e is a project requirement, which may be a consideration in both functional and non-functional design, however design focuses more on operational cost than on cost of development.	1.3
14	D	Software design identifies a software development client's needs, and these can later be checked against during the software testing phase.	1.1
15	D	Selection is a possible purpose of a specific algorithm, but not an characteristic.	2.2
16	B	State is used to represent a 'point in time' snapshot of a structure.	1.2
17	C	The main reason for good naming convention is to aid maintenance. There would be little difference in compile or run times by changing names of variables.	1.6
18	A	This is the main purpose of a DMZ; options b and d are aspects of firewalls. Option C is a distractor.	1.5
19	B	This type of problem has occurred because of exploitation of SQL injection vulnerability. The application itself has been affected by the security incident, such that it is behaving in an insecure way and not as intended.	1.5
20	D	A use case diagram describes a user's interaction with a system as a whole, rather than how a particular algorithm operates.	1.4