

BCS Higher Education Qualification

Diploma

April 2023

EXAMINERS' REPORT

Software Engineering 1

Questions Report:

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| A1 | <p>This question was based on section 3 of the syllabus. Approximately 55% of candidates attempted it.</p> <p>For part a) many candidates were able to explain the various design principles but were unable to provide the required examples from the case study. This suggests that candidates have learned the principles separate from the application of the principles. Candidates found difficulty in explaining abstraction as a way of simplifying a system and separation of concerns being fundamentally about decomposing large complex problems into smaller manageable units.</p> <p>Regarding part b) most candidates were able to give an explanation of a class diagram. However, candidates failed to mention the static structure representation of a class diagram and had difficulty in mentioning the benefits from using a class diagram. Answers that mentioned benefits such as offering a better view of cohesion and coupling, and facilitated a better understanding of the system modularity earned above the minimal marks gained by many candidates who could not describe any valid benefits.</p> <p>Part c) was attempted by only half of the candidates who did this question. The class diagram was based on the case study, but many candidates ignored this element of the question and subsequently were unable to gain reasonable marks. Very few answers were able to correctly show relevant attributes or methods. Some candidates did not fully appreciate the standard UML representations to use in class diagram.</p> |
| A2 | <p>This question was concerned with section 4 of the syllabus. It was the most popular question in book A with over 71% attempting it.</p> <p>Part a) was well answered with respect to explaining the difference between verification and validation, however very few candidates gave an example from the case study to illustrate the distinction.</p> <p>Part b) dealt with traceability. Candidates showed a good appreciation of the meaning of traceability, but few candidates were able to fully discuss the importance of tracing requirements through the lifecycle. Some candidates attempted to use an example from the case study to illustrate traceability. Part iii) of this question asked for the description of a mechanism to track requirements being met in a project. A simple mechanism such as the requirements traceability matrix would have been</p> |

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| | <p>appropriate here. Many candidates gave valid project management methods to monitor requirements. This often involved quite lengthy answers for a 5-mark question.</p> <p>Part c) on process visibility was poorly answered, with most candidates not explaining what it means or why it is important. An explanation based around the way in which deliverables are created from all the project activities is what was sought in this question.</p> |
| A3 | |
| | <p>This question was based on section 5 of the syllabus and dealt with aspects of reuse in a software development project. Fifty per cent of candidates attempted this question. Many candidates were able to give a good account of benefits and difficulties in software reuse.</p> <p>For part b), which dealt with application frameworks. B i) which asked for explanations of the key features of a framework were poorly answered. Answers suggested that applications such as MS Word or Excel were application frameworks (confusing an application with an application framework). Candidates did not provide a correct example such as .NET, Ruby, or similar frameworks.</p> <p>B ii) was well answered with answers indicating that the framework goes beyond a simple collection of classes. A considerable number of candidates agreed that a framework was nothing more than a library of commonly used classes and ignored the aspects of control that come from a framework. For b iii), near all candidates were able to articulate two alternative approaches to software reuse.</p> |
| B4 | |
| | <p>This question is based on section 1 of the syllabus and deals with software development models. All students attempted this question. Both part a) and b) asked for a description of the stages of popular models. Part a) additionally required the identification of appropriate examples of projects that were particularly suitable for the relevant model whilst part b) asked students to discuss the disadvantages of the specified model.</p> <p>In general students dealt with the descriptions well but when giving examples for part a) they did not justify their answers and therefore the answers were not suitable. When asked to give examples it is recommended that the student provides a justification, whether or not it is explicitly requested, this allows the marker to have confidence that the student has selected an example based on confidence rather than speculation. When asked for disadvantages the student also needs to provide an appropriate justification so that the marker can be confident that the student has fully understood why the particular aspect is disadvantageous. To help underpin the answer it is beneficial to provide a context so that your answer is more robust.</p> <p>Students answering this question provided fewer robust examples of appropriate projects and failed to provide suitable contexts and justifications for the disadvantages. These are the main factors for marks being lost on this question.</p> |

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| B5 | |
| | <p>This question is based on section 2 of the syllabus and deals with software testing. 90% of students attempted this question. Subdivided into 4 sections the students were asked to either describe/ explain the purpose, or the process involved in, certain testing approaches. They were also required to provide instances of when a particular type of test should be applied.</p> <p>Students answering this question were strong when describing the more common types of testing but struggled when it came to lesser known testing techniques.</p> <p>A particular weakness was evident when they answered the question on process with few scoring pass level or above for this section. Equally students were less confident in defining why the particular type of testing brought benefit, with too much emphasis being placed on particular stakeholder perspectives rather than being more balanced.</p> <p>Understanding the utility of all testing techniques and the processes involved would improve the probability of success when answering this type of question.</p> |
| B6 | |
| | <p>This question is based on section 6 of the syllabus and deals with project management, costing and risk. Thirty per cent of students attempted this question. Part a) considered the cost of ownership and evaluation of a particular system and infrastructure from key criteria such as support, risk, and downtime. For part b), students were expected to explain a particular costing technique and then consider how the application of the technique could impact on key aspects of planning a project.</p> <p>Students need to understand the concepts of costing with respect to how it can be impacted by system infrastructure factors such as downtime. Also comprehension is needed around the main approaches to costing and how it impacts upon a management activity such as planning.</p> <p>Understanding costing is a key skill for software engineers; factors such as the merits or otherwise of the different costing techniques and how they impact upon the project, and equally how variations in system parameters can impact costs, is vital if a software engineer is to fulfil their role.</p> |