BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

SOFTWARE ENGINEERING 1

Friday 24th March 2017 - Afternoon
Answer **any** FOUR questions out of SIX. All questions carry equal marks.
Time: TWO hours

Answer any Section A questions you attempt in Answer Book A
Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are **NOT** allowed in this examination.

Section A
Answer Section A questions in Answer Book A

A1. The assessment of software quality is a subjective process where the quality management team has to use their judgment to decide if an acceptable level of quality has been achieved.

a) Give THREE examples of questions related to a system's quality characteristics you would ask as a member of the quality management team to determine whether or not the software is fit for its intended purpose.

(6 marks)

b) Software quality is not just about whether the software functionality has been correctly implemented, but also depends on the software quality attributes for example dependability, usability, efficiency and maintainability. List another SIX quality attributes.

(6 marks)

c) It is not possible for any system to be optimised for all quality attributes. Select TWO quality attributes and explain what factors may have to be sacrificed when these quality attributes are improved.

(4 marks)

d) Commercial pressure for an early product release will affect product quality.

(i) State THREE quality attributes you might pay less attention to in these circumstances.

(3 marks)

(ii) When less attention is paid to EACH of your quality attributes stated above, identify TWO characteristics of the final product that may be affected as a result.

(6 marks)

A2.

a) Give THREE reasons why, in the start up phase of a project, estimates will have a wide margin of error.

(6 marks)

b) Experience-based estimating techniques can be used to make software effort and cost estimates. Describe THREE activities a manager might perform when applying these techniques.

(6 marks)

c) COCOMO-II is a model used to help estimate the effort and cost of a software product by using cost drivers to determine the amount of effort required. Describe how each of the following cost drivers can influence the amount of effort that will be required in the development of a software system:

(i) Reliability **(3 marks)**
(ii) Reusability **(3 marks)**
(iii) Analyst capability **(3 marks)**
(iv) Multisite development **(2 marks)**
(v) Development schedule **(2 marks)**

A3.

a) Explain how prototyping can be used in the following software development processes:

(i) Requirements engineering process **(3 marks)**
(ii) Systems development process **(3 marks)**

b) Describe what is meant by the term *throwaway prototyping*.

(3 marks)

c) Describe what is meant by the term *evolutionary prototyping*.

(3 marks)

d) Discuss TWO major uses of using paper-based prototypes in the development of a software product.

(4 marks)

e) Compare the advantages and disadvantages of using prototyping in software development.

(9 marks)

Section B
Answer Section B questions in Answer Book B

B4. Incremental methods can be used in the development and delivery stages of a software project.

a) Describe any TWO advantages in using an incremental development method. **(6 marks)**

b) Describe any TWO disadvantages in using incremental development. **(6 marks)**

c) Explain any TWO advantages of using incremental delivery in a project. **(8 marks)**

d) What type of project is not suited to incremental methods? **(5 marks)**

B5.

a) A software product is more effectively tested if it is built with testability as a consideration. Describe any FOUR characteristics of a software product that will enhance its testability. **(12 marks)**

b) Briefly explain ways in which visibility can be enhanced in software testing. **(7 marks)**

c) The validation and verification process ensures that software is 'fit for purpose'. Describe the difference between validation and verification. **(6 marks)**

B6.

a) When planning to adopt a Reuse-based software development project there are several key factors which should be considered. Explain any THREE of these factors. **(12 marks)**

b) Using a commercial-off-the-shelf (COTS) package is an example of software application system reuse.

(i) List THREE benefits of using a COTS package. **(3 marks)**
(ii) List THREE disadvantages of using a COTS package. **(3 marks)**

c) Describe TWO important problems encountered when attempting to integrate a COTS package with other packages and systems **(7 marks)**