

BCS HIGHER EDUCATION QUALIFICATIONS

Level 4 Certificate in IT

March 2015

EXAMINERS' REPORT

Information Systems

Overall Comment

Candidates seemed to have understood the rubric with fewer answering more than two questions in Section A.

Overall the evidence suggests that candidates would benefit from reading the question thoroughly before attempting an answer.

Apart from A2, which was the most popular question, a similar number of candidates attempted each of the other questions. However, there were still a number of poor attempts.

Answers to Section B were not to the same standard as Section A. A number of candidates did not answer five Section B questions.

Please note that the answer pointers contained in this report are examples only. Full marks were given for valid alternative answers.

SECTION A

Candidates were required to answer **TWO** out of the four questions set

A1

{please see exam paper for question}

Answer pointers

a)

- (i) UML - Unified Modelling Language and Object-Oriented analysis technique such as use case, class encompassing attributes and methods, collaboration, sequence and activity diagrams. These diagrams portray behaviour and interaction between objects. Data structures and methods are combined together within the object-oriented framework.
- (ii) Soft system approach – e.g. ETHICS, which deals with analysis from the personal, ethical, political and social angle or SSM devised by Checkland with 7 stages to solve unstructured problem situations. Techniques such as CATWOE, rich picture diagrams, conceptual models, root definitions showing conflicts, behaviour and interactions between actors and stakeholders.
- (iii) Prototyping – also known as RAD, e.g. DSDM or Agile - several methods of developing the system based on user interaction and user requirements; e.g. throw-away, spiral, partial, evolutionary all based on differing areas of the system in various depths.
- (iv) Structured systems analysis methodology – e.g. SSADM provides a strict structure and deliverables at each stage, ranging from requirements analysis, requirements specification to logical and physical modelling. Techniques include data modelling, data flow diagrams, normalisation, entity life histories etc.

- b)
- (i) An entity life history deals with the aspect of time and the life of an entity from its creation to its deletion. It contains the concepts of sequence, selection and iteration.
 - (ii) A logical data model consists of entities, attributes and relationships between entities. These relationships can be one to one, one to many or many to many (which needs resolving). They can be optional or mandatory depending on circumstances. Other more advanced techniques would be acceptable.
 - (iii) Normalisation is the production of simple stable relationships as a basis for relational analysis. The various stages reduce the duplication, redundancy of data and update anomalies. 1NF - removes repeating items, 2NF - removes partial dependencies and 3NF removes transitive dependencies.

Examiner's comments

This question relied on the understanding of a variety of methodologies and techniques. There was a good pass rate of 60%. In part b) there were a few instances of three techniques being described (when only two were asked for).

A2

{ please see exam paper for question }

Answer pointers

- (a) This system will be complex and require careful planning, a preliminary survey will need to be carried to ensure that the terms of reference, requirements and constraints are clearly understood, the resources are available, risks identified, options considered, and the budgets are practical. The Project Manager would present findings to senior management before commencing with a more detailed feasibility study.
- (b) A feasibility report should contain resources, economic, technical, social, legal and ethical aspects plus a brief overview of problems and possible alternative solutions enabling the management to confirm the development before too much time and money has been spent.
- (c) Fact finding techniques include interviews, questionnaires, observation, sampling, record searching, focus groups, workshops, JAD sessions – a brief example of three is expected.
- (d) External entity – customer, processes – reservation, checking in and out, payments, data stores – reservation, customer details, room descriptions, checking in/out, and payments.

Examiner's comments

This was attempted by most candidates and had an overall pass rate of 58%. Few understood the need for a preliminary survey when attempting a large costly investigation. However, the rest of the question was well answered by the majority, although fact finding techniques should be aimed more at users not customers.

A3

{ please see exam paper for question }

Answer pointers

- a)
- (i) Techniques such as combo boxes, drop down menus, text boxes and command buttons, functionality such as dates, number of days, calculation of total and automatic generation of reference numbers.
 - (ii) Clarity of screen, good use of colours, simplicity, and flow from left to right, consistency, good help facilities etc. Simple, well designed screens are expected, with appropriate field headings, help facilities, navigation aids etc. Security issues such as the use of passwords, user names and card payment security should be provided.
 - (iii) Validation would be very simple; e.g. checking existing customer number is valid and exists and details displayed, range checks, type checks and presence, marks would be obtained for inclusion of categories or severity of problem.
- b) Either parallel running or pilot changeover would be most suitable, but the latter is more likely. The appropriate choice should be described and justified. Functionality, performance, resilience and usability can be tested. Both methods are more costly but there is less risk. It is unlikely that direct changeover would be appropriate. Other aspects would include transferring data to the new database, thorough system testing, user training, allocation of user names, passwords and roles, production of appropriate user guides (manual and technical), installation of any new equipment etc.

Examiner's comments

In this section half of the candidates obtained over 40%. There was evidence of some confusion over the term implementation, although the question implied that the system had been developed.

A4

{ please see exam paper for question }

Answer pointers

- (a) Examples would be use of database management systems, web technology, object oriented technology, multimedia, cloud computing, various types of commercial software products, etc. Database management technology ensures that data is kept in one place, it is secure, and multimedia is the combination of media other than text which is the normal medium for processing information and includes speech, sound, pictures, video clips. Object oriented technology enables the use of objects that can be defined by encapsulating data definitions as well as processing methods and which promote reusability. Trading, advertising and communicating over the Internet would obtain competitive advantage. Other aspects may be described such as use of technology within the hotel security systems and business, e.g. electronic key cards, surveillance cameras, availability of on-line facilities in each room , card payment protection etc.
- (b)
- (i) A systems analyst is responsible for the analysis, design, development, implementation and maintenance of an automated system. S/he will use methods, tools and techniques enabling the production of a professional computerised system.

- (ii) A DBA is responsible for the design, development, control, support, maintenance and security of the database.
 - (iii) A network administrator is responsible for the technical aspects of the network, trouble-shooting, adding/maintaining users, security, support, issuing of usernames etc.
 - (iv) A web designer will use object oriented technology to design and implement web-based systems enabling on-line use by users/customers etc. Security issues will also need to be taken into consideration.
- (c) A member of the BCS should be professional, ethical, competent and responsible with integrity at all times throughout his/her working life.

Examiner's comments

This question was attempted by 47% of the candidates with a good pass rate of 62%. For those who did not answer the question well, there were no common themes.

SECTION B

Candidates were required to answer **FIVE** out of the eight questions set

B5

{ please see exam paper for question }

Answer pointers

Up to 3 marks for each reasonable comment

Areas of concern

- Communication
- Control
- Delivering the right product
- Standards
- Support once the system goes live
- Hand over / implementation
- Training
- What happens if outsourced company is unable to deliver or goes bankrupt
- Etc.

Examiner's comments

The evidence suggests that this was a poorly answered and attempted question.

The majority of answers ignored the outsourcing element and simply stated the life span of a normal project.

B6

{ please see exam paper for question }

Answer pointers

a)
Case Computer Assisted / Aided Software Engineering
Use of an application to generate code / screens / SQL / database etc
Using a methodology to support development
Use of diagrams etc to support development

b)

Used in project management
The program (or project) evaluation and review technique
Network diagram drawn
Helpful to establish the critical path

c)

An initial meeting designed to scope the project
Requires buy in from both sides.
Requires people at the meeting that can make decision from both sides.
May use storyboarding / other techniques to get an initial design scope

Examiner's comments

The sections on CASE and JRP were reasonably well answered.

The PERT Chart section in places often became a notes section on any project management style. Where a GANNT chart was the only reference, low marks were awarded.

B7

{please see exam paper for question}

Answer pointers

a)

i) An RDBMS is a set of binaries that manage a database that supports relational algebra or database
Typical examples are access, oracle, mysql, etc
Probably the most common database in use

ii) A cloud database is a managed database that can be private or public.
It is typically managed by an outsourced company.
Depending on contract, extra features / data etc can be purchased on demand.

c)

Advantages

Less start up costs
Service is managed by outside company, less expertise required
Future proof, any additional required can be purchased, and also scaled back

One mark for any reasonable advantage

Disadvantages

Data is managed by outsourced company so there is a risk
Dependant on outsourced company to be reliable, honest etc

May be difficult to manage resource query/database optimisation etc
Reliant on the fast reliable network

One mark for any reasonable disadvantage

Examiner's comments

The evidence suggests that this was a poorly answered question.

The majority of the answers confused servers and cloud based servers.

Very frequently cloud databases are managed via a third party company and this element was often missing.

B8

{ please see exam paper for question }

Answer pointers

This was a straight text book question. For each section.

2 marks for the correct depiction of the chart

2 marks for discussion of the type of data they represent best.

Examiner's comments

Reasonably well answered question.

There were a number of answers that missed keys / legends / references etc.

Out of the three, the scatter chart was answered the weakest.

B9

{ please see exam paper for question }

Answer pointers

For example

text

Can represent accurate data in a small footprint (data, space etc)

Requires the reader to be able to understand the language the text is written

May not be attractive enough for some of the visitors to the web site

Examiner's comments

A varied attempt. A number of candidates still spoke about TV / radio / newspaper which this question is not about.

A number of candidates stated that video and animation are different media. Both represent moving images and are not as different as a number of candidates implied

A number of answers showed limited thought and depth. For example, a considerable number of answers repeated the disadvantages of video, picture, sound as that it takes a great deal of time to load and consumes storage but made no attempt to differentiate between the three. There needs to be a greater difference between the advantages and disadvantages.

Also, a number of answers discussed inappropriate imagery etc which is outside the scope of this question and would be addressed if this had asked for an ethical perspective.

B10

{ please see exam paper for question }

Answer pointers

Examples

- Errors reporting each hour / day / period
- Types of errors reported
- The software / application reporting the most errors
- The peak times that errors occur
- The users reporting the least / most errors
- The time is taken to respond to calls
- List of outstanding calls
- Etc.

Examiner's comments

The evidence suggests that this was a poorly attempted question. Most answers stated what a help desk was and the operation of a help desk and did not address the question which asked about the data collected.

B11

{ please see exam paper for question }

Answer pointers

One or two marks for each reasonable area that was discussed.

- Qualification
- Educational
- Professional
- Experience
- Number of years
- Type of projects
- Experience before becoming a project manager
- Traits of project management
- People skills
- IT skills
- Relevant experience in the industry

Examiner's comments

The evidence suggests that this was a poorly answered question. There was evidence of confusion as to what a project manager is.

A great many of the answers were descriptions of either a Systems Analyst or a Business Analyst. Where there was overlap marks were awarded.

B12

{ please see exam paper for question }

Answer pointers

This question was slightly different to the normal question on testing.

Up to 4 marks in each area for reasonable points that discussed relevant issues.

a) A broad range of answers possible

Could use black box; i.e. data in checked against reports coming out
Could use performance / stress testing to ensure that the DB is performing to expected levels

b)

Again, could use black box; e.g. data entry leads to expected results on screen
could use white box to ensure that all logic on web pages / application are being executed etc.

c)

Any test that emphasises the real time element.
If black and white box are used, then there had to be a reference to the real time nature of the tests!

Stress / Performance could be used to ensure that the real time elements are performing etc.

Examiner's comments

Some very good answers but also a lot of notes without reasons, to get full marks the answer must contain reasons.

Real time systems was the weakest area answered.