

**BCS THE CHARTERED INSTITUTE FOR IT
BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT**

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EXAMINERS' REPORT

Information Systems

Overall Comment

The standard for Part A continues to improve slightly. However, there are some very weak candidates. Exam techniques need to be discussed by course providers and the rubric explained. Too many good candidates waste time answering three questions in Part A.

There is still the need for candidates to read the questions carefully and not spend too much time on a question which only has a few marks. For example, B6 requested ONE prototype; a large proportion of answers discussed more than one prototype and also gave advantages.

There is still a great deal of note dumping. This can be acceptable for some questions, but often it is a note dump in the area that has no bearing on the answer. For example, B5 concerning three aspects of HCI; a number of half page note dumps on HCI were often presented which were not on the question topic and therefore were awarded very few marks.

Section A

A1

Answer Pointers

- a) Methods such as the traditional software development life cycle, SSADM, Yourdon, OO methodologies, Agile methods, etc would be acceptable. The techniques and theories of each are expected. Prototyping method (RAD) would not be very suitable as the question indicates a large system. The stages typically include: preliminary survey, feasibility study, requirements analysis and specification, logical and physical design, development (coding), testing, implementation, review and maintenance.
- b) Processes such as providing selection of various departments within the supermarket, customer registration and sign in, displaying, describing and querying products, adding/amending order (basket/cart), payments, promotions etc. Data stores such as department, product, customer, order (basket/cart), payment etc.

- c) i) An HLDFD would show the flow between the processes of enquiring, ordering, payment and confirmation of products. Data stores product, customer, order, and payment. External entity - customer.
- ii) An ERD would show the relationship between customer and product via an order (basket) and order line (resolving the many to many between order and product).

Examiners' comments

This had a good pass rate of 59%. Part a) was open ended and a hard methodology description was expected, however a few responded arguing that problems were more easily explained using soft system techniques such as rich pictures. Prototyping was accepted as a development technique. Examples of processes, data stores, data flow diagrams and entity relationship were reasonable. A context diagram is not a high level data flow diagram.

A2

Answer Pointers

- a) A feasibility report should contain the scope, overall requirements, financial aspects of the project, resources, schedules, technical and business options, social and legal considerations, operational issues, problems and recommendations. It should be used to confirm the viability and development of the project.
- b) The purpose of PERT and Gantt charts are to identify tasks and their relationships in terms of length of time, start and end dates, bottle necks, dependencies and the critical path can be identified in a PERT chart. Gantt charts are simpler but can still be useful in showing a more simplistic view of a project. Examples are required.
- c) As it is a large project, the manager would need to identify tasks and subtasks (WBS), the time scales, scheduling, resource and team allocation, technical considerations, budget requirements, feedback mechanisms, testing and implementation schedules, risk assessments, rescheduling and reallocation of resources as required, progress meetings and evaluation of the project's success.

Examiners' comments

This was the least popular Part A question although 58% gained more than 40%. There still seems to be confusion between the project lifecycle stages and management of a project. The stages are important but they need to be managed effectively to produce an efficient project. The contents of a feasibility report and PERT and Gantt were described well.

A3

Answer Pointers

Model Answers

- a) Data are raw and static facts and has no meaning until being processed, for example customer number, customer name, product no, quantity become a company order as part of the business process. Information is the result of processing, e.g. an order, a monthly report, profit and loss statement, productivity graph etc.
- b) Examples: integers (quantity), alphanumeric/text (customer name), Boolean (confirm order yes or no), picture (image of product), audio (music sample), video (tour of supermarket shelves) etc.
- c) A Database Management System stores data which is processed to assist in a business or organisations' requirements. Typical facilities: collection, creation, amendment, deletion, query, reporting and storage of data, manipulation, data definition, integrity, control, security, recovery, back up and restoration etc.
- d) There are several types of DBMS, e.g. Hierarchical, network, relational, object-oriented, and multimedia. Hierarchical – the first type of database based on a hierarchical structure, access was via a top down approach. Network – an updated version of the hierarchical arrangement but the data is stored as a network via indices; several access methods can be used. Relational – based on Codd's relational calculus, based on the relationship model, access by SQL using calculus theory, via primary and foreign keys. These have been updated over the last few years to include OO characteristics. OODBMS – based on object models and object theories of encapsulation, inheritance, persistence of objects in classes. MM – multimedia based databases etc

Examiners' comments

Despite the popularity of this question, which was attempted by 63% of the cohort, the pass rate was the lowest (40%). Parts a) and b) were answered poorly, candidates should be able to understand the difference between data and information and be able to quote data types with examples. The majority of answers for part d) described different processing systems rather than types of database management systems.

A4

Answer Pointers

Model Answers

- a) Firstly there should be a test plan with test data designed to ensure that the system is the right one and is producing the right results. There are several testing methods that can be implemented; e.g. structured walkthroughs throughout analysis and development, white and black testing during coding, regression testing, user acceptance testing, full system testing, alpha and beta testing etc. Prototyping is also a form of testing.
- b) The main approaches are direct changeover, parallel running, staged and phased implementation. Direct is the cheapest, but most risky, parallel running is the safest but time consuming, both staged and phased implementations are still safer, but can be time consuming and certain processes may not be tested properly.
- c) Education and training, implementation of new hardware and software, changes to office layouts, manual procedures, user guides and support, operating manuals, possible new stationery needs to be ordered etc

Examiners' comments

This was the most successfully answered question with a 69% pass rate. However there was some confusion from a small number of candidates who misinterpreted part b) and described different ways of physically transferring data from the old system to the new using differing data transfer media. These were acceptable but very few mentioned conversion of the data either by dedicated internally developed software, manual input or professional software house systems. The majority described typical implementation methods. Diagrams, such as the V testing model were acceptable. Part c) was not answered well; candidates did not read the question and too often described the software development life cycle. The question indicated 'after testing and transferring data' implying that the development was complete.

SECTION B

B5

Answer Pointers

This was a common sense style question.

One mark per reasonable point. With max of 4 marks per section

Colour

Avoid high contrast colours being used together

Perhaps use corporate colours

Use colours to attract, rather than distract

Use colours are per recognised conventions – red stop / danger – green go etc.

Ensure colours may site usable and readable

Fonts

Use recognised / standardised fonts – the target machine may not have that font pack

Avoid unreadable fonts – i.e. gothic font that is then has italics applied

Make sure font is readable

Use mixed case where appropriate – it may be easier to read

Be consistent – avoid using upper case in placed and lower in others

Icons

Use recognised set – i.e. use disc rather than elephant for saving

Make sure there help with icons to make sure user understands picture

Make sure is a reasonable size

Make use of “video” version of icons to make understanding easier

Examiners' comments

The majority of candidates answered this reasonably well. There was a lot of overlap in areas (for example discussing colour in fonts and / or in icons). It was clear that most of the candidates understood this domain.

B6

Answer Pointers

- a) one mark for recognised prototyping style
up to four marks for reasonable discussion on style
no marks for discussion advantages and disadvantages.
Must focus on techniques and style
- b) dependent on prototyping style and answers must map to part a)

For example

Throw away prototyping

The work is discarded once complete

If the work is not discarded the application may have serious issues

The user may expend the real application is developed in the time taken to build the prototype

Perhaps initially there is insufficient upfront analysis

If the user does not engage there will be a problem

Needs to be managed properly, time controlled

Issues with function creep

...

One mark for each reasonable point made with respect to part a)

Examiners' comments

Very well attempted question and candidates generally clearly understood this area.

A number of candidates wasted time by discussing 2 or 3 styles and stating the advantages (perhaps this time could have been spent on other questions)

B7

Answer Pointers

- a) One mark for any reasonable comment:
Use of key code / locks on the door
Restriction of access to room to authorised persons
Use of backup power supplies
Regular audits
Install CCTV etc to ensure that only authorised people have access
Secure the equipment – both physical (bolted or lock) and logical (back door access, default accounts)
...

- b) One mark for any reasonable comment:
- Use of user ids and passwords
 - Removal of unwanted / unused software that might help hacker
 - Test server to ensure it is secure
 - Removal of default and demo accounts
 - Use a naming convention for files /users etc that does not conform to the norm
 - Delete / remove installation programmes.
 - Ensure files and folders have the correct permission
 - ...

Examiners' comments

Another reasonably well answered question. The biggest issue with a number of answers was the overlap between a) and b). Some answers used for example passwords in detail in both sections.

Some answers were too narrow in focused and discussed one area in detail, whereas this type of question is looking for a discussion on a range of topics.

The basic answer should have been hardware / physical protection for part a) and logical protection for part b)

B8

Answer Pointers

Up to four marks for general discussion

- a) Tends to be used where the problem domain is well understood
- They use a structured, engineered approach to solve the problem
 - Well understood
 - Perhaps too focused on traditional number crunching systems or replacement of paper systems with a computerised version
 - Example, SSADM
- b) Tends to be used where the problem is perhaps not too well understood
- Checkland proposed a frame work, rather than a linear, step by step approach
 - Recognises that people, politics have an issue with computer projects
 - Perhaps a greater emphasis on the people rather than the technology
 - Example, SSM
- c) Formed from the recognition that one style of methodology does not work for all projects
- A structured approach is customised to meet the project requirements
 - A more iterative approach to development
 - Project method adapts to circumstances
 - More use of time boxing

Examiners' comments

As expected on an IS paper this area in the marks breakdown shows a high number of passes and a reasonable average.

Part a) was well explained and clearly understood.

Part b) was on the whole reasonably answered

Part c) was weakly answered.

If this question has just been about Soft and Agile methods the average mark would most likely have been at failure level.

There is clearly a weakness in the area that needs addressing (agile then soft).

B9

Answer Pointers

- a) One mark for each reasonable comment

Removal of issues with respect to insert, update and delete issues

One fact is store in one place

Ensures consistency

- b) up to three marks that describes the process of

The Key

The Whole Key

And nothing but the key

Up to six marks for showing an example that reflects the answer given in b)

Examiners' comments

Looking at the statistics for this question it seems like this area was clearly understood.

Part a) was quite poorly answered.

A great number of candidates simply stated the three stages, which was asked for in part b), and therefore were awarded few marks.

Candidate should be advised to re-read the questions to ensure that their effort is rewarded rather than simply seeing a term and providing a note dump.

Part b) was reasonably well answered.

As this is NOT purely a database paper, the normalisation was not marked as hard as it could have been. It was clear that some students knew the theory but not the application.

B10

Answer Pointers

One mark given for any reasonable comment

- a) provides a single point of contact
 - can provide 24 hour support without needing full teams in place
 - enables users to define issues and problems with software
 - need not be confined just to the IT
 - enables organisation to monitor the quality of given area by reference to issues / bugs reported
 - can automate fault fixing by providing an AI style interface
 - track issues with software, hardware etc.
 - can provide timely interaction with customers
 - can provide a human face / instant intervention
 - ...

- b) One mark for any reasonable comment

- Number of calls per time period
 - Number of errors / bugs per time period
 - Ability to track metrics or KPIs
 - Any type of audit report

Examiners' comments

Only a quarter of the candidates attempted this question and only a quarter of those passed.

This is an area of concern as most medium to large scale IT organisations will have help desks systems and they play a vital role in helping to manage the company.

Part a) was answered better, and if the question had just been on part a) the pass rate would have been 50%.

Part b) was very weakly answered and needs addressing.

B11

Answer Pointers

One mark for each reasonable point

- a) Matrix management is the practice of managing individuals with more than one manager who can allocate them work
People with similar skills are pooled for work assignments, resulting in more than one manager
Increase co-operation and communication across business “silos”
Be more effective in delivering work across the business
Be able to respond flexibly
Develop broader people capabilities
..
- b) Everyone one in the organisation is managed by someone (apart from the CEO)
Tree structure
Clear structure
One manager
Defined promotion / career path
Authority and responsibility are structured
..

Examiners' comments

This was the least answered question with just 23% attempting it. But half of those passed it.

Part b) was well answered but Matrix management was poorly answered.

A good starting point for this area is

http://managementlab.org/files/u2/pdf/classic%20innovations/Matrix_Management.pdf

B12

Answer Pointers

5 typical stages are

- Initial / Initiation phase
- Definition phase
- Design phase
- Development phase
- Implementation phase

Up to 2 marks for each named phase and a couple of comments

One mark for each phase with a reasonable time period

Each phase should not be equal

The first two and last stage should be shorter

The third and fourth phase should last longer

Marks awarded for any reasonable discussion with appropriate time scales.

Examiners' comments

There were a number of answers which showed that the candidate knew what the project life cycle was and what the stages of a project are but they failed to add any sort of time scales to those stages. The candidate showed knowledge but did not answer the question directly.

The answers showed an understanding of the life cycle but no understanding that a feasibility study takes far less resources than the rest of the project.

There is not one right answer to the style of question but there are plenty of incorrect answers that show a lack of understanding of the domain.

Where a candidate tried to indicate that different stages required different resources credit was given.