BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 6 Professional Graduate Diploma in IT

MANAGEMENT INFORMATION SYSTEMS

Monday 20th March 2017 – Afternoon
Answer **any** THREE questions out of FIVE. All questions carry equal marks.
Time: THREE hours

Answer any <u>Section A</u> questions you attempt in <u>Answer Book A</u>
Answer any <u>Section B</u> questions you attempt in <u>Answer Book B</u>

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

EXAMINERS' REPORT

General comments on candidates' performance

Generally, candidates provided answers of a reasonable standard and pass rates were similar to those of previous years.

The standard of answers was reasonably consistent across questions this year, although the "discussion" question A1 was less popular than the other questions. Despite this, those candidates who attempted A1 generally demonstrated the required understanding expected at this level.

The evidence suggests that although candidates appeared to have the required knowledge and understanding, they provided brief answer points without further expansion or examples to illustrate those points.

An indication is given below of the expected answer points for this examination. However, marks were given for additional points or for valid alternative answers, if relevant to the question.

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SECTION A

A1.   You hear a member of the Board of your financial organisation, while in discussion with major customers, say that *"Mobile computing renders all traditional IS/IT obsolete".*

Discuss and justify the extent to which you agree or disagree with the above statement.

(25 marks)

Answer pointers:

It is not uncommon for MIS specialists to respond cogently to the views expressed by senior managers. The views expressed may or may not be well founded, but the need is for clarity and reasoned discussion in order for the senior staff to be able to form a balanced view.

Note that it is equally acceptable to agree, disagree or partially agree with the statement. The key thing is that the response is measured, appropriate and well supported.

(Up to 5 marks for the format, layout and style of the report.
Up to 5 marks for each of 4 illustrative examples.)

Examiners' comments:

This was the least popular question on this paper, attempted by only 45% of candidates who sat the exam. Despite this, the answers received were often good, with a pass rate of 82% being achieved. The evidence suggests that those who failed to score well in this question often gave answers which were of limited size and scope and which failed adequately to address a question at this level of study.

As expected, the responses to this question both agreed and disagreed with the statement. The key requirement was that an MIS professional should be able to provide a balanced, cogent set of arguments around such a management statement. The majority of candidates met this objective.

Those who scored poorly often gave answers which were poorly thought out and badly structured, and sometimes not adequately argued.

A2.   Cloud computing is making considerable progress into areas of MIS that are traditionally provided and managed within the physical perimeter of an organisation.

a)   Describe THREE aspects of cloud computing which may challenge conventional thinking in the provision of MIS.

(12 marks)

b)   For ONE of these aspects, discuss in detail the risks AND benefits of the Cloud approach.

(13 marks)

Answer pointers:

a) The three aspects could have included, but were not limited to, the following:

- Loss of physical management of data within the organisation
- Outsourcing of key aspects of MIS operations
- Negotiation of SLAs regarding external operations
- Potential for increased speed of response to changing capacity requirements
- Need to manage risk of external communications failure

Note that the question asked the candidate to "describe" three aspects. A simple list would only score low marks.

(Up to 4 marks for each of 3 aspects.)

b) The answer to this part of the question needs to address BOTH the risks AND benefits of the Cloud approach to MIS in order to score well. The object is for the candidate to demonstrate a balanced approach to decision making.

(Up to 6 marks for each of risks and benefits.)
(Up to 7 marks for the manner in which the discussion is managed by the candidate.)

Examiners' comments:

This was a fairly popular question, attempted by 72% of candidates who sat the exam. There was a pass rate of 63%. The evidence suggests that those who failed to score well in this question frequently gave answers which were of very limited size and scope and which failed adequately to address a question at this level of study.

In part a) some candidates lost marks because they did not describe the three aspects requested in the question. In a number of cases, candidates provided a simple list of aspects, which did not meet the requirement of the question to describe them.

In part b) many candidates lost marks because they failed to address both risks and benefits – as was requested in the question. Candidates are advised always to read the question thoroughly and to answer the question which is asked.

A3.   End user computing is a long established part of the culture in the company you have just joined as Head of MIS. While you knew this before taking up the post, you are surprised by the extent to which the company relies on departmental spreadsheets and databases that have been developed over many years by various teams in the organisation.

    a)   Define end user computing.

(5 marks)

    b)   Describe FIVE success criteria for end user computing.

(10 marks)

    c)   Discuss how the success of end user computing could be measured.

(10 marks)

Answer pointers:

a) Definition of EUC: End-user computing can be defined as systems developed by non-IT users. Typically, such systems will be developed using office software, such as spreadsheets and databases, and may use and extend primary data downloaded from corporate systems.

(Five marks for a definition that is similar.)

b) Success criteria for end user computing:

•   Agreed boundaries between end-user and corporate MIS computing/any agreed general requirements.

•   Use of common software/desktop setup. The need for the whole organisation to have a common computing platform.

•   Shared resources.   The need for shared programs, data, files, standards, naming conventions, networks etc.

•   Data ownership. Data ownership and availability to be agreed by all participants. This should include a possible need for an initial data analysis to include the identification of both standing and transactional data.

•   Training.

(Two marks for each success criteria up to a maximum of 10 marks.)

c) Measures of the success of end-user MIS:

•   User, management and customer surveys
•   Degree of data duplication
•   Consistency and timeliness of data
•   Productivity improvements (Business and IS)

(Two to three marks for each measure discussed up to a maximum of 10 marks.)

Examiners' comments:

This was a reasonably popular question, attempted by 52% of candidates who sat the exam. The pass rate of 54% was achieved. The evidence suggests that those who failed to score well in this question frequently gave answers which were of limited size and scope, which failed to adequately address a question at this level of study.

In part a) the definition of end user computing varied somewhat but some flexibility was allowed to reflect the various usages of the term in the industry at large. Some candidates provided very extensive answers to part a), which only had a potential score of 5 marks. In many cases much of this effort would have been better applied to the other sections of the question.

The success criteria in part b) were frequently well addressed; however, some candidates either gave too few criteria or did not give sufficiently different examples, which led to lower marks being obtained.

The aim of part c) was to define how success can be "measured", so the onus was on the candidate to provide examples which could be used as metrics. A number of candidates lost marks by not doing this. Other candidates lost marks because they did not provide sufficient depth of material to support their arguments.

SECTION B

B4.

   a) State and justify **THREE** characteristics of information.

(9 marks)

   b) With the aid of suitable illustrative examples, discuss the extent to which rule-based Expert Systems (ESs) can support the Human Resources (HR) function of an organisation. Include an overview of a rule-based ES within your answer.

(16 marks)

Answer Pointers:

This question is about the nature of information and also about the scope of support that can be provided to a particular organisational function, in this case Human Resources (HR), by a rule-based Expert System (ES).

In answer to part a), candidates could state and justify three characteristics, such as:

- **Relevant:** Information must be relevant to the recipient receiving it. It will be of NO use to the recipient if it is not relevant. In other words, it becomes data. For instance, sending the CEO of an international manufacturing company a report on the daily sales of one of many thousands of small components that are manufactured and is selling well, will probably be considered 'irrelevant' to the CEO and therefore data in his/her eyes. (It may, however, be relevant, and hence information, to the component manufacture supervisor.)
- **Timely:** Information must be timely (i.e. neither too early nor too late) to be of use, hence to be information. Too late would possibly render it to be data, as the decision that it would have informed has already taken place. The same is true with it being too early, as the decision to be taken may not yet be known. For instance, hearing some negative news about a supplier after you have taken a decision to go with them is not going to help that decision.
- **Accurate:** Information needs to be correct to what it is portraying. If not, it may mean a bad decision is taken on that basis, so it is not helpful (i.e. data) and indeed can be the very opposite. For instance, inaccurate positive data about a supplier could lead to the wrong decision being made to go with that supplier.

Other characteristics that might have been described include:

- Comprehensive
- Concise
- Clear
- Unambiguous
- Presented appropriately.

(For each relevant and mutually exclusive characteristic stated - 1 mark, plus 2 marks for suitable justification = 3 marks x 3 characteristics = 9 marks.)

Part b) required the candidate to describe what a rule-based Expert System (ES) is and discuss the extent to which such MIS can support the Human Resources (HR) function within organisations.

Expert Systems (ESs) are computerised systems that are programmed to imitate human decision making that would typically be considered to be the province of experts (the word "typically" is used explicitly here, as some ES are considered to be no more than an application of publicly available

knowledge to a given situation). Rule-based ESs are those ES that are based on knowledge in the form of rules (typically of the form IF..THEN..(ELSE); so-called Production Rules). A rule-based ES typically has a knowledge base (storing potentially thousands of Production Rules), a working memory which acts as a transient store of facts built up through an individual use (aka consultation) of the ES, an inference engine that determines the applicability of rules and which is activated at a given time, and some form of interface – typically enabling Q/A dialogue and possibly allowing a form of "what if" analysis once the ES has made recommendations/conclusions. There may also be some form of machine learning/knowledge acquisition component, enabling knowledge in the form of rules to be added to the knowledge base. Candidates may provide a diagram of the arrangement of the components to support their descriptions.

The Human Resources (HR) function of an organisation manages issues surrounding the people that make up the organisation; around their hiring, working for the company and leaving.   People are a vital aspect of organisations; without people, an organisation would not operate. An effective HR function looks towards making the most of the human resource potential, not just dealing with the administrative matters associated with staffing. Activities that typically fall under HR include recruitment, staff development/training/appraisal, payroll and pension, employee safety and relations, and dismissal/leaving/voluntary severance.

Rule-based ES do have a role to play within HR functions, in recruitment (M&S, for instance, used a rule-based ES to help screen applicants for their graduate training programme), in pensions (rule-based ES available to aid forecast of pensions, and ES to help select fund management options for staff) and in performance evaluation of staff. A rule-based ES might give advice on the next steps for training/staff development to an individual staff member, based on their existing staff development, achievements and aspirations. HR is not the most popular aspect of the organisation in terms of rule-based ES applications. Rule-based ES seem to have been used more in some aspects of HR than in others. For instance, there is little apparent application within the employee relations management side of the function where (rule-based) ES tend to focus on the provision of advice concerning aspects such as legal matters. The scope of (rule-based) ES in this function may be limited due to the significant, yet essential, person-to-person interaction and personalised counselling involved.

(For an overview of a rule-based ES - 6 marks, plus a sound explicit or implicit understanding of the HR function – 2 marks, plus an assessment of the extent of its use within HR - 4 marks, plus for suitable quality examples - 4 marks, to a maximum total of 16 marks.)

(TOTAL Q2 = 9 + 16 = 25 Marks)

Examiners' comments:

This was a fairly popular question on the examination paper, attempted by 62% of candidates. The overall average mark was 8.5 out of 25. The evidence suggests that this was principally due to the answers given to Part b) of the question.

Part a) was generally well attempted, with some candidates gaining full, or near to full, marks. Several answers, however, did not provide suitable and/or sufficient justifications for each one of the identified characteristics. A few candidates stated characteristics of computerised information systems (such as secure, consistent and non-duplicated) rather than of information per se, thereby restricting the number of marks they could attain.

The evidence suggests that in part b) the description of an Expert System (ES) was the best element of most of the answers received, but some descriptions were too brief for 6 marks, and only a few candidates explicitly and effectively articulated what was meant by an ES being rule-based. While many answers evidenced some understanding of the Human Resources (HR) function within an organisation, there were only one or two answers that truly answered the question posed; many gave one or two examples that illustrated some application of ES but did not provide an overall picture of the extent of the use of rule-based ESs within HR functions. Some candidates presented

examples that were not rule-based ES (but were in fact MRS or traditional DP systems) within their answers, which limited the marks that could be attained and served to confuse their answer.

B5.

a) For **EACH** of the following MIS concepts, outline its key features and discuss its applicability to Business Intelligence (BI) systems development.

    i. Traditional development approach.

(7 marks)

    ii. CASE tools.

(7 marks)

    iii. Steering group.

(6 Marks)

b) Explain why top management support is vital for MIS project proposals.

(5 marks)

Answer Pointers:

This question focuses on several aspects of MIS project development. Part a) requires candidates to describe some fundamental MIS development concepts with which they should be familiar and assess their suitability for BI systems developments specifically. Points that could be made within the descriptions/assessments include:

Part a)

    i.   Traditional development approach: development is undertaken in a series of steps, with each one being completed before the next starts. Steps may be requirements determination, design, coding, testing and installation. Maintenance can be seen as the next cycle or as the last of the series of steps. Another name used for the traditional approach is the waterfall approach, as it can be depicted as a waterfall from one stage to the next in the development process. The motto of this approach is to "get things right first time", where backtracking to a previous stage is seen as weakness in the quality of the work within the previous stage. The approach is suitable for developments that have static and clear requirements at the outset of the development and can be developed in one go. This is not a particularly appropriate development approach for BI systems, where you need to "start small, aim big'". It also it does not allow for quick hits to emerge en route to the eventual BI system "product". However, within a particular <u>phase</u> of a BI system development, a traditional approach may be effectively employed.

(For a sound description of the concept - 4 marks, plus assessment of suitability - 3 marks, to a maximum of 7 marks.)

    ii.   CASE tools: Computer-Aided Software Engineering (CASE) tools support the development of an information system. They may automate/support one or more of the steps within a development methodology. They also enable the creation of clear and comprehensive documentation associated with development activities and enable the interrelationships between the steps to be rigorously maintained.

Some of the ways in which they can support and enhance could include:

1) Enforcing a standard methodology and design approach.
2) Improving communication between users and technical specialists.
3) Automating tedious and error-prone portions of analysis and design, such as supporting class diagram and ER modelling designs.

4) Automating code generation.

At the heart of the most comprehensive CASE tools is some form of CASE information repository, which stores all the information/designs defined during methodology usage, such as ER diagrams, data flow diagrams, use case diagrams, flow charts, etc. CASE tools can be separated into Upper CASE and Lower CASE tools, the former to do with analysis and design (i.e. the 'front end' aspects of systems development), whereas the latter are predominantly concerned with coding and testing support (i.e. the "backend" aspects of systems development).

CASE tools can be used within BI Systems developments, for instance, to aid ER modelling of an enterprise-wide data warehouse, star schema design of individual data marts, prototyping using screen and report generators, and generally storing details that could form the basis of metadata. However, there are few CASE tools that could support an entire BI system development methodology, such as BI roadmap (Moss & Atre, 2003), from beginning to end.

(For a sound description of the concept - 4 marks, plus assessment of suitability - 3 marks, to maximum of 7 marks.)

iii.   Steering group: A steering group is set up to facilitate the development of a particular systems development project or initiative within an organisation, ensuring that it remains on track. It comprises both business and technical people from across the organisation, including top management in the form of the business sponsor. It is a transient structure, lasting for the duration of the project. It maintains oversight of the project and helps to facilitate/guide the development where necessary.

Steering group concept is appropriate to all MIS developments, including BI systems projects. The path of BI systems development would be much more difficult without it. For instance, it can act as an arbitration board, when disputes arise during BI systems project development. It also allows management to keep track of progress and to ensure, through participation, their continued awareness and sponsorship of the development.

(For a sound description of the concept - 3 marks, plus assessment of suitability - 3 marks, to maximum of 6 marks.)

Part b)

This concerns the fact that top management support is vital for the approval to fund MIS project proposals. Top management support is essential for any IS development project, but even more so with respect to MIS. Many of the benefits of an MIS cannot easily be quantified (e.g. improved effectiveness of decision making, better image and reputation of the company) and some MIS implementations have "knock-on" benefits for MIS implementations in the future (e.g. what has been termed "return on asset" within the BI systems field). Therefore, an MIS project proposal can look vastly inferior on paper compared to an operational support system with significant tangible benefits (such as cost and time savings), where traditional CBA is critical in deciding which project proposals to fund. Top management support is vital to ensure all benefits are duly considered in the funding decision and for the approval to be given, despite a less strong quantified CBA.

(1 mark per salient point in the argument, to a combined maximum of 5 marks.)
(Total Q3 = 7 + 7 + 6 + 5 = 25 Marks)

Examiners' comments:

This was a popular question, attempted by 74% of candidates. The overall average mark attained was 9 out of 25.

In part a) many candidates, whilst able to describe the key features of both the Traditional approach to MIS development and CASE tools, were unable effectively to discuss their applicability to BI systems development. Indeed, many candidates did not even attempt to apply the concept. In the case of a Steering Group, only a few candidates showed understanding of the concept and only the occasional candidate could highlight its usefulness to BI systems developments.

In part b) many answers discussed why top management need to support MIS projects throughout their development, rather than focusing on the proposal stage. The justification for top management support was often cited as the fact that they will use the MIS directly, which is not always the case and would, in any event, be an unfair way of selecting the proposals to take forward to development. Very few candidates mentioned Cost-Benefit Analysis (CBA) and the problems that beset MIS proposals, given that they typically possess many intangible benefits.