THE BCS PROFESSIONAL EXAMINATION
Professional Graduate Diploma

April 2005

EXAMINERS' REPORT

Management Information Systems

General

Around half of the candidates had prepared for the examination and provided answers of a reasonable standard. The other half generally appeared unprepared and gave answers that could be expected from anyone with a reasonable general knowledge but with no specialised MIS insight. For a qualification at this professional level, clearly the examiners are looking for evidence of an in-depth knowledge of MIS that has been gained by academic study and rounded by practical application and experience.

Whilst there were many excellent answers, far too many candidates lost marks through poor presentation and failure to read the question. If a question asks for an answer in a particular manner (say a report or memorandum) the examiners are seeking an answer in this format. Similarly, if a question requests advantages and disadvantages, the examiners will be unable to award marks if only general descriptions are provided. Many candidates, including some of the better prepared ones, lost marks by not answering all parts of a question.

Although this comment has been repeated in previous examiners' reports, regrettably a number of candidates answered more than the required three questions. Because of time constraints, this meant that there were often four or five poor answers rather than three good answers. As credit will only be given for the three best answers, future candidates are advised to attempt only three questions and to concentrate their thoughts accordingly

An indication is given below of the expected answer points. However, marks were given for additional points if relevant to the question.

Question 1

Two sisters own Herbal Remedies Inc, a company that advertises and sells herbal remedies. Customers use the postal services to order products advertised by Herbal Remedies Inc in newspapers and magazines. The products are paid for by cheque or debit/credit card and sent to the customer, together with a product catalogue. The business has grown rapidly over the past two years and recently the sisters have recruited five full time staff to assist with the growing clerical workload. Although the product catalogue is maintained using desktop publishing software, no other computing facilities are employed by the company.

One sister wishes to change fundamentally the business processes by advertising and selling products via the Internet. The other sister strongly disagrees; as well as being unclear how any Internet system would operate, she is concerned about data security and the legal aspects of using computer technology.

As an IT consultant you have been engaged to write a report to:

a) Describe how Internet and back-office systems could be used to advertise and process Herbal Remedies Inc's orders and stimulate further business. **(12 marks)**

b) Discuss the security threats associated with such systems and the countermeasures that should be employed. **(7 marks)**

c) With reference to the use of Internet and back office systems, outline the contents of two legislative requirements with which Herbal Remedies Inc would need to comply. **(6 marks)**

Answer Pointers
(*Syllabus coverage: Using MIS as a tool for changing the ways of the business, management and control of information resources, evolution of Internet applications*)

This question tests the candidates' ability to apply their theoretical knowledge of MIS to a typical situation faced by many emerging businesses.

Part A - Internet and back-office systems
The sisters will need a contract with an ISP to host a web site. Basic facilities would include:

Website:
- Conversion and hosting of the existing product catalogue
- Provision of a shopping facility
- Means of secure payment
- Capture of customer details: name, address, email etc.
- Help facilities for queries
- Herbal Remedies Inc's contact details, including email
- Customer reviews and testimonials
- Herbal/medical information
- Any other reasonable facility

Back Office:
The sisters require back office systems to reduce their clerical workload. They will also require PCs, back-up security devices, PC software, printing facilities, networking for all staff and a communications link to their ISP. The back office systems would include facilities for:

- Order processing
- Accounting
- Maintenance of a customer database
- Mass emailing of special offers etc.
- Any other reasonable facility

These could be provided by developing in-house facilities using office systems, purchasing small business applications packages or using the facilities available through an ASP.

Herbal Remedies Inc will also need to ensure that the two sisters and sufficient of their staff are trained in the use of all hardware and software.

(One mark for use of any sensible report format, one mark each for each point covered, maximum 12 marks)

Part B - Security Threats/Countermeasures
- Physical security/equipment and manuals kept in locked areas
- Accidental damage/preventative measures, care when storing hazardous materials, insurance.
- Data misuse/use of random passwords changed regularly, encryption of data.

- Staff threats/vetting of all staff, access control for staff, special measures for disgruntled staff, staff internet policy
- Data loss/regular security copies of all software and data - stored offsite, appropriate DR plans.
- Hackers and virus attacks/use of firewalls, virus-scanners (and regular updates)
- Application failures/ensure applications are tested before use, use of reliable products, no use of new releases, control of system modifications, use of established suppliers.
- Any other security threat/countermeasure

(One mark for each security check/countermeasure identified, maximum seven marks)

Part C - Legislation
Any two items of legislation related to MIS will attract marks. These two are likely to have been selected from the following four, although credit was given for any other valid legislation:

Computer Misuse Act 1990
The Act makes provision for securing computer material against unauthorised access or modification and deems it a criminal offence for anyone doing so or attempting to do so. Persons are guilty of an offence if:

- they cause a computer to perform any function with intent to secure access to any program or data held in any computer
- the access they intend to secure is unauthorised
- they know at the time they cause the computer to perform the function that that is the case
- they gain or attempt to gain unauthorised access to computer material with intent to commit further offences
- they make any unauthorised modification of computer material

Copyright, Designs and Patents Act 1988
Description of Act
The Act specifically includes a computer program within the meaning of a 'literary work'. When a software product is purchased, the purchaser merely buys the right to use the software in strict accordance with the terms and conditions within the licence agreement. Section 16(1)(a) of the 1988 Act states that any person who performs a restricted act or authorises others to perform such an act without the consent of the owner of the copyright will infringe the copyright.

Infringement
- Copying or reproducing software or hardware in any material form
- Issuing copies of software or hardware to the public when copies have not previously been in circulation
- Performing, showing or demonstrating the software or hardware in public
- Broadcasting it
- Making an adaptation or translation of it

Health and Safety (Display Screen Equipment) Regulations 1992
Definition of a workstation:

- An assembly made up of display screen equipment, operational accessories, disk drive, telephone, modem, printer, document holder, chair, desk and the immediate environment. *(Two marks according to completeness of definition)*

Standards *(One mark each, up to eight, from the following:*

- Analysis. Every employer should perform a suitable analysis of all workstations to ensure that their employees are not exposed to H and S risks. The employer has a duty to reduce the risks.

- Requirements for workstations. Include the provision of proper equipment for workstations put into service on or after 01-01-93. Workstations in use prior to that date must have complied by no later that 31-12-96.

- Space requirements. There should be sufficient space for the user to change position and vary movements.

- Lighting. Must be satisfactory and provide a suitable contrast between the screen and the background environment. Glare must be eliminated.

- Reflections and glare. Workstations must be designed so that light sources such as windows cause no direct glare. Windows should have some sort of blind.

- Noise. Noise created by a workstation should be taken into account so that attention is not distracted and speech is possible.

- Heat. Excess heat should not cause discomfort.

- Radiation. This must be reduced to negligible levels.

- Humidity. Adequate levels should be established and maintained.

Data Protection Act 1998

The data protection principles are that personal data shall be:

- obtained and processed fairly and lawfully
- held only for lawful purposes which are described in the register entry
- used or disclosed only for those or compatible purposes
- adequate, relevant and not excessive in relation to the purpose for which they are held
- accurate and, where necessary, kept up to date.
- held no longer than is necessary for the purpose for which they are held
- able to allow individuals to access information held about them and, where appropriate, correct or erase it
- surrounded by proper security.

(For each area of legislation, one mark for identification of the area, a further two marks for two main issues covered by the legislation, maximum 6 marks).

Examiner's Comments
Although this question was relatively straightforward to anyone with a general understanding of MIS and its current use, the marks gained by candidates were disappointingly low.

Part A. The website part of the question was answered well, with candidates clearly drawing on their own experiences. The back office part was less well answered, with many candidates ignoring this part of the question altogether; however, those who did attempt this part of the answer produced some excellent work.

Part B. Again, most candidates identified the more obvious security threats posed by hackers and viruses and the required countermeasures for these two points were generally described well. However, only the better candidates considered physical, data or staff threats.

Part C. Generally poorly answered, with many candidates surprisingly confusing "legislative requirements" with development methodologies, network design or strategic considerations. The general low marks achieved in Part C meant that only a surprisingly small number of candidates achieved high marks for Question one.

Question 2

2. You have been recruited as the MIS manager for a life insurance company where the Chief Executive Officer (CEO) has two concerns: first, the capabilities of the company's policy administration legacy system need to be improved and advice is needed regarding the range of options available; second, since the introduction of a new network, there has been a steady growth in the number of end user systems and the CEO feels that some guidance is essential.

Write a memorandum to the CEO to:

a) Describe six possible options the company has for improving the capabilities of its legacy systems. Include in your answer the advantages and disadvantages of each option. **(15 marks)**

b) Discuss the prerequisites of successful end-user computing and comment on how the success of such systems could be measured. **(10 marks)**

Answer Pointers
(*Syllabus coverage: Re-engineering legacy systems, end user computing, applications and implications)*

Part A - Legacy Systems
The options available are:

Restructure (or equivalent wording). Remove redundant code and develop and/or simplify interfaces with other systems.

Advantages - inexpensive, retain functionality, risk averse in the short term, change is minimised.

Disadvantages - short term fix, fixed structures of legacy systems are retained.

Re-engineer (or equivalent wording). Not BPR, but placing legacy system on a new hardware/software platform whilst retaining existing business functions.

Advantages - Removes threat of hardware/software unavailability. Business processes unchanged.

Disadvantages - Business processes unchanged. Fixed structures of legacy systems are retained.

Refurbish (or equivalent wording). If legacy system is maintainable, add extensions such as a web front end or provide extracts for EUC.

Advantages - can give impression of changed business processes without underlying changes, inexpensive.

Disadvantages - fixed structures of legacy systems are retained.

Rejuvenate (or equivalent wording). Transfer data to a modern DBMS, re-engineer with BPR, include data warehousing/mining.

Advantages - provides for the medium term, releases organisation from the fixed structures of legacy systems.

Disadvantages - can be almost as expensive as a new system, user time required for testing.

Replace with a package (or equivalent wording). Use a package with the same functionality as the legacy system

Advantages - the advantages of using a package - preset business solution, support and maintenance etc.

Disadvantages - the disadvantages of using a package - need to modify, limits individual business processes, vulnerability to supplier etc.

Replace with a new bespoke system (or equivalent wording). Write a new system for present and future.

Advantages - opportunity for complete strategic review, use of modern technology.

Disadvantages - high cost and high risk

(Two marks for each option identified and described,, maximum 12 marks, plus one mark for presenting the answer in memorandum format, plus two marks for quality of argument and approach, total 15 marks)

Part B - EUC
Five expected prerequisites are listed below.

- 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.

(One mark for each prerequisite, maximum five marks)

Five 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 MIS)
- Costs versus benefits measurements

(One mark for each measurement, maximum five marks)
(Prerequisites + measurements 5 + 5 = 10 marks)
(Marks for Question 2 = 15 + 10 = 25 marks)

Examiner's Comments
For this question candidates performed either very well or very badly. There was a tendency for many candidates to write two or three pages of unnecessary introduction to this question. Although no marks were lost, this approach meant they lost time and many then subsequently failed to answer the second part of B (see comments below).

Part A. The “six Rs” answer to this question can be found in MIS textbooks and those candidates who knew the various alternatives gained very high marks. Regrettably, a significant number of candidates wrote about development methodologies or project stages and no marks could be given.

Part B. This was another opportunity for candidates to display their textbook knowledge and some high marks were gained. However, a large number failed to suggest any way in which the success of end-user computing could be measured and therefore missed out on at least some of the available five marks.

Question 3

3. For each of the following scenarios, recommend an overall approach, together with suitable techniques and tools, that you would use to develop the proposed MIS. Justify your choice of development approach, techniques and tools in each case, and state any assumptions you make within your answer.

a) A manager wants an individual Decision Support System (DSS) to aid his management decision making but has very little idea of what support the DSS should provide. Any development of the DSS should occur only when there is sufficient justification in terms of costs and benefits. **(9 marks)**

b) An MIS is required to support the needs of several investment managers with respect to financial investment decisions. Users range from those that are fairly novice, to those that are highly proficient, with computers. Each user has a very clear view of his/her own support requirements, but only a subset of the total user requirements can be satisfied. Therefore, a consensus needs to be formed as to what are the most important requirements to implement. **(8 marks)**

c) An organisation requires an MIS that will automate the provision of the company's many standard management reports. A large database will need to be developed to store the data required for the MIS reports. **(8 marks)**

Answer Pointers

(Syllabus coverage: Development of MIS – traditional MIS lifecycle and contemporary development methodologies, Use of CASE, RAD & Object Orientated, Matching development methodologies to application requests).

This question is all about MIS development approaches, methodologies, techniques and tools. However, rather than just expect candidates to describe these, the question provides three scenarios and the candidates have to provide what they believe to be a suitable approach, with accompanying techniques and tools, for the scenario as given. It is expected that candidates may make quite a few assumptions in their answers and, as long as these are stated and are appropriate, their answer will be considered against these.

(a) This question is about DSS development, and candidates should pick up on the hints made in the question, namely:

- ⇒ The fact that the decision maker does not know what s/he wants to support his needs
- ⇒ The fact that any aspect of the development needs to be cost-benefit justified.

A prototyping approach to development is expected, where the prototype evolves into the final system. The cost justification is difficult, given the non-quantifiable benefits that come with DSS, but a technique such as Keen's Value Analysis (as described in Fidler & Rogerson) may be adopted. ROMC may be used as a technique to aid analysis & design aspects within each prototyping cycle. The M part of the ROMC (memory aids) may be designed using Entity-Relationship Modelling and the O part of the ROMC (Operations) may be designed using flow charting or pseudo code. Tools such as fourth generation languages to aid the prototyping plus case tools support for techniques, such as ER modelling, would be beneficial.

Marks:

- *For any appropriate development technique, tool, approach or issue point described – 1 marks to a maximum of 9 marks*

Total a): 9 Marks

(b) This question is about an MIS that is to be used by several users with differing yet exact requirements. The question provides additional hints such as:

⇒ The wide ranging IT literacy of the prospective user base.
⇒ The total requirementshas to be a subset of those required by the prospective users.

A traditional approach to overall development is expected, given the exact nature of requirements. However, the requirements specification phase needs to use some form of group decision making to result in the set of requirements that are most important to the organisation. This may involve the prospective users, technical staff and management who understand the organisation's priorities. HCI design may need to be prototyped to gain appropriate user feedback, and the provision of different interface styles (e.g., command-based, menu-based, iconic, graphical, etc.) depending on user experience and frequency of system use needs to be considered within the design. Traditional database techniques and flowcharting may be used to help design the functionality of the system. After requirements specification, the remaining activities in the traditional lifecycle may occur on a phased basis, where only a portion of the system is created at a time e.g., for a particular user at a time.

Marks:

- *For any appropriate development technique, tool, approach or issue point described – 1 marks to a maximum of 8 marks*

Total b): 8 Marks

(c) Again, this question contains hints within it as to the requirements. Here, the MIS is essentially automating a known, fixed and very large set of management reporting requirements. A traditional approach is expected here, possibly in a phase by phase approach after the database is designed. The design of the database will probably require the use of techniques such as ER modelling, The source data for the database needs to be defined, and any conversion routines developed (using possibly techniques such as pseudo code as an intermediate representation). If there are any large and complex mathematical processes in providing a report, then this will need describing in an appropriate form such as flowcharting or pseudo code.

Marks:

- *For any appropriate development technique, tool, approach or issue point described – 1 marks to a maximum of 8 marks*

Total c): 8 Marks

Total Question 3 = 9 + 8 + 8 = 25 Marks

Examiner's Comments

This question was attempted by about a third of the candidates, and it was clear that many did not read or understand the question properly. Some candidates did not talk about development issues at all within their answers, choosing only to provide theoretical descriptions of the MIS mentioned in the question. These answers gained minimal marks. Of those that did appreciate the development orientation of the question, very few answers were totally convincing in terms of development approach, techniques and tools proposed. Several candidates either felt the traditional life cycle approach or an iterative/prototyping approach was suitable for all the three situations; in other words they paid no attention to the very different situations described in each of the parts of the question.

In Part(a), candidates often presented a suitable approach to the DSS development, but failed to mention how they would deal with the cost-benefit issue. Those who did tackle the cost-benefit issue, felt that some form of feasibility study was in order, which is fine if you know what the requirements of the user are at that stage (the trouble is the user does not know himself what he wants and what is possible) and that the benefits are easily quantifiable (which is not always true). As a consequence, the Value-Analysis approach seems the more appropriate approach to cost-benefit in this case.

In Part(b), candidates frequently omitted to deal with the issue of too many requirements, although they did pick up on the fixed nature of those requirements.

In Part(c), candidates did typically pick up on the database development aspect of the proposed MIS, describing suitable techniques (e.g., ER modelling) and tools (e.g., CASE tools) for such development. However, many forgot the standard reporting requirements of the proposed MIS, suggesting an OLAP tool be implemented for ad hoc data analysis only.

Question 4

4. Modern businesses are choosing to build data warehouses and/or data marts and use OLAP (either Relational OLAP or Multi-dimensional OLAP) tools to access information regarding the organisation and its environment. However, building a data warehouse is not an easy task, with the data population (also referred to as the Extract-Transform-Load (ETL)) process being one of the most frequently cited reasons for delays in, or cancellation of, a data warehousing project.

Within the context of the above statement, explain, with supporting illustrative examples, what is meant by each of the following terms or phrases:

a) Data warehouse **(5 marks)**
b) Data mart **(5 marks)**
c) Multi-dimensional data **(5 marks)**
d) An On-Line Analytical Processing (OLAP) tool **(5 marks)**
e) Data population **(5 marks)**

Answer Pointers

(Syllabus coverage: MIS support capabilities – Principles and applications of trends in support such as BPR, DTP, data warehousing and DTP, use of data modelling and data mining facilities).

This question is all about the understanding of several key data warehouse concepts. The following are brief overviews of these concepts.

a) Data Warehouse –

- ⇒ A consolidated and consistent store of data upon which business query and analysis tools can work to provide quality information to user(s).
- ⇒ Data taken from several operational systems, and kept physically separate.
- ⇒ Usually relational in nature, but may be de-normalised data, due to management reporting requirements
- ⇒ Query and analysis tools include OLAP and data mining tools
- ⇒ Meta-data regarding the extraction process and data structures is kept in the data warehouse

Marks:

- *For any appropriate point made – 1 mark to a maximum of 3 marks*

- *For any illustrative example or added commentary – 1 mark to a maximum of 2 marks*

Total a): 5 marks

b) Data Mart –

⇒ A small data warehouse that centres on some subset of the organisation, for example a particular function such as sales and marketing

⇒ Companies may start with a data mart and then this is then added to to derive a data warehouse over time.

⇒ Alternatively, a data mart may be provided separate to a data warehouse so that it is optimised for the particular company aspect it is centred on. It will take its source data from the data warehouse. It may be stored using a different data model, such as multi-dimensional, to the data warehouse, such as relational.

⇒ You could say that OLAP tools require a data mart to be defined according to the data model of the OLAP tool.

Marks:

- *For any appropriate point made – 1 mark to a maximum of 3 marks*
- *For any illustrative example or added commentary – 1 mark to a maximum of 2 marks*

Total b): 5 marks

c) multi-dimensional data –

⇒ This is data that is held in a multi-dimensional format. The format allows data to be represented in 2 **or more** dimensions (rather than just the two-dimensional approach of the relational model), although we tend to talk about representing "cubes of data".

⇒ A lot of statistical business data (e.g., sales of products, quantities of orders received, etc.) can be represented naturally in a multi-dimensional way. One of the dimensions is invariably a time dimension, such as months, weeks, years, days). The manipulation that occurs on a multi-dimensional database is called slice-and-dice, where the data is "cut" up until the appropriate information remains.

⇒ Drill down on multi-levelled dimensions are usually made possible, enabling statistics to be viewed starting, for example, at a year summary level and then drilling down to monthly, weekly and then daily figures.

⇒ Candidates may actually define data in a multi-dimensional form using appropriate statements.

Marks:

- *For any appropriate point made – 1 mark to a maximum of 3 marks*
- *For any illustrative example or added commentary – 1 mark to a maximum of 2 marks*

Total c): 5 marks

d) An OLAP tool –

⇒ Provides a GUI WIMP interface to either a multi-dimensional database (MOLAP) or a relational database (ROLAP).

⇒ Generic manipulation operators are available to use when the data enables you to do so, e.g., drill down available when the drill-down structures are in place.

⇒ Allow drag and drop of dimensions to view the numbers from many different angles. Allows one click approach to produce the graph of choice from a menu of graph types

⇒ Examples include Powerplay by Cognos and Express by Oracle.

Marks:

- *For any appropriate point made – 1 mark to a maximum of 3 marks*
- *For any illustrative example or added commentary – 1 mark to a maximum of 2 marks*

Total d): 5 marks

e) Data Population -

⇒ This is the process of ensuring that the data within the data warehouse is appropriate, accurate and suitably up-to-date.

⇒ This is seen as being the biggest problem in many data warehousing projects, as it is quite difficult to consolidate the data held on several large databases with their different data formats, data definition, different implementations, etc.

⇒ Candidates may explain the problems using some examples that they have come across in practice, e.g., character versus integer formats for the telephone number attribute which needs consolidating, the problems of periodic data updates – when to do them, defining the conversion of data from which legacy systems into the data warehouse and the manual interventions in the conversion process if needed.

Marks:

- *For any appropriate point made – 1 mark to a maximum of 3 marks*
- *For any illustrative example or added commentary – 1 mark to a maximum of 2 marks*

Total e): 5 marks

Total Question 4 = 5 + 5 + 5 + 5 + 5 = 25 Marks

Examiner's Comments

This was an extremely popular question, and in general most candidates knew a fair amount about data warehousing concepts. However, many forgot to give suitable and appropriate examples to support the theoretical answers that they gave, thereby limiting the number of marks that could be obtained.

The data warehouse concept, which candidates described in answer to part (a), was generally well understood. However, answers tended to be extremely long, sometimes around 6 pages in length. This seemed excessive given that there was a maximum of five marks available for this part of the question. Also, writing such long answers gave candidates much more opportunity to either contradict or repeat what they had already written earlier within their answer, neither of which is good practice!

The data mart concept, which candidates described in answer to part (b), was also reasonably well understood. However, a lot thought data marts could not exist without the prior development of a data warehouse, which is untrue. Also, some did not offer any different description of this concept to that of the data warehouse, which left this examiner wondering whether the candidate really appreciated their differences.

The multi-dimensional data concept, which candidates described in answer to part (c), was not well answered in general. Vague descriptions saying that “multi-dimensional data allows you to look at data from several viewpoints” and that “it is useful for business effectiveness” were insufficient on their own. The best answers provided a

specific and correct example of multi-dimensional data (e.g., sales values by product type by sales region and by month or quantity sold by customer by product by day) and depicted that data in a suitable cube format with appropriate example dimension values. Many candidates mistook multi-dimensional data to mean multi-media data, which is incorrect and incurred zero marks.

The nature and purpose of an On-line Analytical Processing (OLAP) tool, which candidates described in answer to part (d), was reasonable understood, although some answers did not mention the GUI WIMPs interface that these tools tend to have. Many mentioned the Web-based nature of current OLAP tools, which was a fair point to observe. One or two said that OLAP tools only ever have multi-dimensional databases, which is clearly at odds with what is explicitly stated in the first paragraph of the question!

The Data Population concept, which candidates described in answer to part (e), was not as well understood as expected by this examiner. Many misunderstood what data population was about, instead defining it as the quantity of data in a data warehouse. Of those that did know what data population was, very few gave really good examples to supplement the theoretical part of the answer.

Question 5

5. *a)* Describe the key characteristics of the information that is typically required by senior management, comparing it to that required by tactical and operational management. **(10 marks)**

b) Evaluate, with supporting examples, the extent to which Executive Information Systems (EISs) and Executive Support Systems (ESSs) can satisfy the information requirements of senior management. **(15 marks)**

Answer Pointers

(Syllabus coverage: Management in organisations – Strategic Management and MIS.)

This question is about strategic management's need for an executive information system. Part (a) is a straightforward question, requiring students to list and describe the key characteristics of the information typically required by senior managers, which include:

1. Time horizons are typically long, e.g., over years rather than over months or over days as required by middle and lower level management respectively.
2. A lot of the information can be opinions, judgements, hints rather than factual (more factual at the middle and lower levels).
3. Information is more for planning than for controlling (middle level are more concerned with control than top level management, and lower level management are more concerned with control than middle management generally speaking).
4. Information is typically focused around certain key aspects, or critical success factors, of the organisation which are of particular interest to the senior manager. These aspects of the organisation are far broader in organisational span than that required to be viewed by middle and lower level managers.
5. Information is usually more summarised than detailed, at least initially, in order to spot disturbances or trends over time. Lower level management are working with very detailed figures (e.g., how many orders received in a given week), and tactical management fall midway between lower and top on this issue.
6. External in focus rather than internal. The further down the hierarchy, then more internal-oriented the information tends to be.

Marks:

- *For each appropriate characteristic 3 marks maximum (for the characteristic outlined 1 mark, for any additional comparisons and/or commentary 2 marks) * as many points made to a maximum of 10 marks*

Total a): 10 marks

Part (b) requires candidates to know what an EIS and an ESS are: EIS are information systems that provide access to external and internal information to enable senior executive to track their organisation's Critical Success Factors (CSFs) in real time. ESS can be seen as the same as EIS, but many definitions of ESS make then more than EIS with the additional capabilities of modelling (i.e., one or more DSS components). Then it is expected that candidates take each of the points made in Part a) and show how EIS and/or ESS can provide support for this. For example, Point 1 talks about information needs that require comparisons over a wide time horizon. The EIS provides storage for EIS data over time (data taken from key operational and external systems and stored for use over time) and enables graphical outputs to be easily set up to enable trends to be viewed over these long time periods should this be appropriate. The information suggested by point 2 can be sourced via e-mail connections (that are typically part of the EIS/ESS package) and Internet access via the EIS. Also, some subscriptions may be made available through the EIS, e.g., Dun and Bradstreet or Dow Jones Information Services may be available via the EIS/ESS.

Overall, it is expected that the great majority of the typical senior management information needs appear to be supported well by an EIS or ESS.

Marks:

- *For an overall summing up of the extent to which support can be provided through an EIS/ESS – 2 marks*
- *For each appropriate point made in justification of the overall conclusion 1 mark or any additional commentary regarding a point made 1 mark - to a maximum of 13 marks*

Total b): 15 marks

Total Question 5 = 10 + 15 = 25 Marks

Examiner's Comments

This was also a very popular question on the examination paper, but there was a great deal of variation in the quality of answers provided.

Part (a) required the characteristics of the information typically required by senior management to be described and compared to those required by operation and tactical level management. The two words of the question that were most forgotten by candidates were ***information*** and ***typically***. Looking at the first of these two words, many candidates provided overviews and several characteristics of management work across the management levels (e.g., unstructured problems at senior management level versus structured ones at operational level) but failed to focus on the ***information*** characteristics, which was what the question required. Of those that did focus more on information characteristics, some of the characteristics mentioned were either contentious or ambiguous. For example, several candidates said that senior management required lower accuracy information than that of tactical and operational management – which is untrue as senior management need information that is as accurate as the other management levels (if not more so because of the scope of impact should the information lead to a strategic decision being made wrongly). Some candidates said senior management require unstructured information as compared to

tactical and operational management's requirement for structured information – what does unstructured/structured information mean here? Is unstructured information that which does not have a fixed, regular structure, or is it information that incorporates certain types of information within it e.g., conversations?

With regard to the second of the two aforementioned words, many candidates provided answers that were far too emphatic in what senior management require. For example, they would say that senior management require external information ***only*** and that senior management ***only ever*** need summarised information. Clearly, these requirements are only norms, not 100% guarantees.

Answers to Part (b) were generally disappointing, with many candidates not providing even an attempt at an overall answer as to the extent of support provided to senior management by EIS/ESS. Some answers were simply a definition and description of EIS. Many omitted to define and distinguish ESS. In all, very few saw the connection between part (a) and part(b) of this question, and therefore used their answer to part (a) as a checklist against which to evaluate EIS/ESS support for senior management in part (b).