THE BCS PROFESSIONAL EXAMINATION

Diploma

April 2003

EXAMINERS' REPORT

Professional Issues in Information Systems Practice

General

The pass rate on this module continues to improve as, presumably, candidates and teachers acquire a better understanding of what is expected. It was particularly pleasing to see a significant number of candidates, from all geographical areas, with marks in the 70s and 80s.

The commonest cause of low marks was candidates' inability to apply theoretical knowledge to specific scenarios. This is a cause for concern because there is no point in candidates acquiring theoretical knowledge in these areas if they are unable to apply it to the context in which they work. Questions 2c), 3b) and 6b) all demonstrated this.

Question 1 (Syllabus section 1)

a) Explain the origin of UK engineering bodies, the development of the current structure and how the BCS fits into the current structure. (9 marks)

Answer Pointers

The question required candidates to understand the origin of the UK engineering institutions. Some candidates simply outlined the current structure which was not sufficient to answer the question. A sense of the key stages was required. Something like the following was expected:

"In the 1950s there were many independent engineering institutions, but the status of engineering was low. This led to the setting up of the Engineering Institutions Joint Council in 1962which changed its name to the Council of Engineering Institutions in 1965 when it received the Royal Charter. Despite these changes the status remained low and so the government set up the Finniston enquiry in 1977. The enquiry recommended the statutory registration of engineers. Following the report of that enquiry, a chartered body, the Engineering Council, was formed to implement a uniform system of qualifications (CEng, IEng, EngTech) based on the accreditation of academic awards (BEng, MEng degrees and HNDs) and recognition of approved experience, and to maintain a register of qualified engineers. This was to be done through the member bodies, that is, the professional engineering institutions.

Some candidates were able to go on from this to look at more recent changes. The BCS aspect of the question was skipped by some candidates. All that was required was to show where it fitted into the history and briefly its role as one of the member bodies within the two-tier structure, that is, that it was formed in 1957and received its Royal Charter in 1984, and that it has responsibility for the registration of IS/software engineers and works within the Engineering Council's structures and guidelines.

b) Describe the membership structure of the BCS as a professional engineering body. (6 marks)

Answer Pointers

Most candidates interpreted this question to be asking about the different levels of membership, whilst it was intended to ask about the membership structures more generally. However, either response was acceptable given the ambiguity in the question. For the standard answer candidates would have explained that the BCS is governed by a council, it has specialist groups and regional branches, and the membership is split into professional / non-professional groups. For the non-standard answer detail about the grades, the progression between them and how they encourage / support professionalism was expected.

c) Benyon-Davies states that "information systems is currently at best a semi-profession."

Discuss this statement by comparing the information systems profession to other professions such as medicine and law. (10 marks)

Answer Pointers

Candidates found this a difficult part of the question, with very few giving the expected answer. Bott et al (cited in the Reading List for this module) outline the key elements of the argument; there are also relevant articles in the May 2000 and March 2001 issues of the Computer Bulletin, which all members of the Society receive. The examiners were looking for candidates to understand what made the IS/software engineering profession into a profession, and how it compared with more traditional professions such as medicine and law. The following points were expected:

- A professional has responsibilities and these are formalised in codes of conduct and practice
- Some other professions in the UK have a stronger regulatory power through the licensing of individuals and restriction of the right to practise;
- It is difficult to ensure that everyone who is practicing is of a minimum standard and to enforce the code of practice without formal regulatory powers;
- Whilst there is a body of knowledge in computing as well as in other professions, more emphasis is put on the current technology or practical skill by employers that long term competences – reflecting the immaturity of the profession. However, the emphasis on personal development could have been highlighted as a sign of professionalism.

Many candidates incorrectly concentrated on the speed of change in computing in comparison with medicine or law, apparently unaware of the fact that both of these disciplines are also changing very rapidly. The concept of specialisms in medicine was raised by many candidates but IS also has its specialisms, if perhaps not established as defined career paths. Too many candidates answered this by discussing the use of IS in medicine and law, for which there was no marks.

Question 2 (Syllabus section 5)

a) Many organisations have IT security packages installed that control the security profiles of IT users within the organisation. This typically includes access limitations on data and computer programs in terms of read, update and execute capabilities. In addition many organisations have procedures for checking that software originating outside the organisation is not

contaminated by viruses. Explain how these practices relate to the UK Computer Misuse Act 1990. (9 marks)

Answer Pointers

The Computer Misuse Act 1990 created three new criminal offences: Unauthorised access, Unauthorised access with intent, and Unauthorised modification of data or programs. By restricting IT users' read access to certain systems, programs, databases and files an organisation is attempting to reduce the possibility of unauthorised access.

(3 marks)

By restricting IT users' update access to data and programs an organisation is attempting to reduce the possibility of unauthorised access with intent and unauthorised modification of data or programs.

(3 marks)

Not allowing the loading of computer games onto the organisation's personal computers reduces the possibility of computer viruses being introduced into the organisation's IT systems potentially causing unauthorised modification of data or programs. (3 marks)

b) Compare and contrast the protection offered to citizens and organisations respectively by the UK Data Protection Act 1998 and the UK Computer Misuse Act 1990.

(8 marks)

Answer Pointers

The UK Data Protection Act 1998 gives citizens the right to have access to personal data held about them by organisations. However, an administrative charge may be levied for such access by the organisation. The UK Information Commissioner can fine organisations that contravene the principles of the UK Data Protection Act 1998.

(4 marks)

The Computer Misuse Act 1990 created three criminal offences that can be used against individuals who may in some way interfere with the normal operation of IT facilities: Unauthorised access, Unauthorised access with intent, and Unauthorised modification of data or programs. The criminal offences allow an individual to be fined or given a custodial sentence.

(4 marks)

c) A medical centre has six PCs for use by doctors, and one PC for use by administrative staff for producing repeat prescriptions. Due to an error in the software used, the medication for two different patients attending the medical centre is mixed up, and the patients are given the wrong prescriptions. One evening the medical centre is broken into and one of the PCs containing patient details is stolen.

Explain how the Data Protection Act 1998 relates to this scenario.

(8 marks)

Answer Pointers

The UK Data Protection Act 1998 states that personal data held should be accurate and where necessary up to date. If the prescriptions have been mixed up then the personal

patient data held regarding prescriptions may not be accurate, thus contravening the Act. (4 marks)

The UK Data Protection Act 1998 states that appropriate security must be provided for personal data held. If personal patient data has gone outside the medical centre, then security has been breached. It would need to be established if the security of PCs within the medical centre was appropriate.

Question 3 (Syllabus section 4)

This question was not popular and part b) was badly answered. In many cases the assumptions made were very limited and in the majority of cases candidates failed to produce a credible cash flow forecast. Only a small minority of candidates showed cumulative cash flow figures in their forecasts.

a) Explain what is meant by the terms *working capital* and *cash flow*.

(5 marks)

Answer Pointers

Working capital is the cash required to finance the day-to-day operations of a company. Cash flow is the flow of cash and cash equivalents (typically cheques) in and out of the company.

b) Three people who recently completed the BCS Diploma successfully have established a small company to set up web sites for third parties and, if required, to host the web site on a computer in their office.

They have already won one significant contract that will provide them with about three months work and they have a number of other promising sales leads.

i) Making reasonable assumptions, which should be stated, about the costs and revenues involved, produce a cash flow forecast for the first six months of operation. (15 marks)

ii) Explain how you would use this forecast to estimate the amount of working capital required. (5 marks)

Answer Pointers

Assumptions (apart from obvious ones about magnitudes of costs):

- office is rented and furniture and equipment has to be purchased;
- some travelling will be required but not very much;
- projects get invoiced when they are complete and customers pay within 28 days;
- group wins a smaller project to work on immediately the first one has finished.

End of month	0	1	2	3	4	5	6
Cash out							
Office rent (quarterly in advance)	800			800			800
Purchase of office furniture	500						
Purchase of computer,	2000						

printer, software, etc							
Salaries		3000	3000	3000	3000	3000	3000
Travelling expenses		200	200	200	200	200	200
Heating, etc (quarterly in arrears)				150			150
Comms (telephone, ISP)			100	100	100	100	100
Insurance (office + employers' liability)	500						
Total cash out	3800	3200	3300	4250	3300	3300	4250
Cash in							
Fees from projects					15000		8000
Net monthly cash flow	**(3800)**	**(3200)**	**(3300)**	**(4250)**	**11700**	**(3300)**	**3750**
Cumulative cash flow	**(3800)**	**(7000)**	**(10300)**	**(14750)**	**(3050)**	**(6350)**	**(2600)**

According to this forecast the maximum cash requirement is £14750 at the end of month 3. At least this much working capital is therefore required. In practice, of course, the forecast might be wrong and more might be required. In particular, the effect of delayed payment of invoices by customers should be analysed.

Question 4 (Syllabus sections 8 and 9)

This question was generally answered well by students. However, some students appeared unfamiliar with project management techniques such as Gantt and Pert charts.

a) IT project management can involve the selection of appropriate staff to undertake a particular IT project. Discuss the range of skills that would be required by a team of IT staff to undertake the development of an e-commerce system that would link to an organisation's existing stock control, sales order processing and accounting systems.

(12 marks)

Answer Pointers

The range of skills that would be required by a team of IT staff to undertake the development of an e-commerce system that would link to the organisation's existing stock control, sales order processing and accounting systems might include the following (or suitable alternatives):

- Skills in appropriate website development tools such as Macromedia, Dreamweaver, MS FrontPage or Java, which will be required to construct the ` website.
- Skills in appropriate website connectivity tools such as ASP, CGI and Perl, which will be required to connect the website to the existing systems.
- Skills in web page design and design of website navigational structures, in order to produce a website that users will be find easy to use.
- Knowledge of the design and operation of the existing stock control, sales order processing and accounts systems, in order to design appropriate system interfaces (either real time or batch).
- Website and interface testing skills, in particular the differences that need to be catered for regarding different Internet browsers and navigators.

- Skills relating to achieving good Internet search engines rankings for the website in order to attempt to ensure that potential users can easily locate the website.

b) Having chosen a team of IT staff to undertake the development of the e-commerce system, explain how you would plan the project activities, assign staff to the project activities and monitor the progress of the project.

(13 marks)

Answer Pointers

You could plan the project activities, assign staff to the project activities and monitor the progress of the project as follows (or suitable alternatives):

Break down the project into a series of phases, activities and tasks and construct a PERT chart for the project by looking at the full set of tasks required for the project and their dependencies. The PERT chart will identify those activities within the project that can be done in parallel and the time delay between tasks. The critical path for the project can then be calculated, which is the shortest timeframe in which the project can be completed. (5 marks)

A Gantt chart can then be constructed to show the order of project tasks to be undertaken on a segmented timeframe basis. The Gantt chart can be used to show the staff that will be involved in the individual tasks and the set of tasks to be done by a given member of staff. The Gantt chart can be used to show the effort expended and the effort remaining on each of the given tasks, to assist in monitoring the progress of the project.

(5 marks)

Of course the plans may have to change if certain staff members become unavailable or if particular tasks take longer than estimated. However the PERT chart can show how this will affect the dependencies, and the Gantt chart can show how this will affect staff workloads. (3 marks)

Question 5 (Syllabus section 2)

This question proved very popular and was generally well answered.

a) Explain the following terms:

- **sole trader**
- **partnership**
- **company** **(12 marks)**

Answer Pointers

A sole trader is a business owned by a single individual who is fully entitled to the revenue of the business and is fully responsible for any losses the business suffers.

A partnership is a business arrangement in which two or more people jointly own a business, sharing the profits and being jointly responsible for any losses.

A company is an organisation legally allowed to produce and trade. It has a legal existence distinct from that of its owners. Ownership is divided among shareholders.

b) Shareholders of a company have *limited liability*. Explain this term and contrast it with the liability of sole traders and partners.

(7 marks)

Answer Pointers

Limited liability means that the most a shareholder can lose is the money they have invested in shares. Unlike sole traders and partners, shareholders cannot be forced to sell their personal possessions when the business cannot pay.

c) Two existing firms can join together in two different ways. One firm may make a *takeover bid* for the other, or a *merger* may occur.

Contrast a takeover bid with a merger. (6 marks)

Answer Pointers

When a firm makes a" takeover bid", it offers to buy out the shareholders of the second firm. Managers of he second firm will usually put up resistance, as they are likely to lose their jobs. Shareholders of the second firm are likely to accept the offer if it is sufficiently attractive. In contrast, a merger is the voluntary union of two companies where they think they will do better by amalgamating.

Question 6 (Syllabus section 7)

Most candidates attempted this question and the high average suggested that they had learnt from the similar question on a previous paper.

a) The Code of Conduct of the British Computer Society is divided into four main sections. Explain what these sections are and describe briefly the issues addressed by each section. (12 marks)

Answer Pointers

This part was generally very well done with candidates able to reproduce the clauses of the Code. Candidates were expected to outline the main clauses in the Code of Conduct, as shown below. Credit was awarded for depth of understanding of the code rather then ability to state the clauses perfectly or to put them in the right section. Whilst it was not necessary to be able to state every clause verbatim, some lost marks by not giving enough detail of what was in the section. Candidates used a mixture of the new and old forms of the code; either was acceptable. Based on the traditional form:

The public interest: this describes members' responsibility to be aware of, and comply with, relevant aspects of the law and other forms of regulation and, more generally, to safeguard public health, protect the environment and have regard for human rights.

Duty to employers and clients: this deals first with due diligence, warning clients of the consequences of their decisions and time and cost overruns, and maintaining confidentiality. It then goes on to require members to avoid various corrupt practices such as the giving or taking of bribes, misrepresentation or false claims of independent judgement.

Duty to the profession: generally acting in such a way as to uphold and enhance the standing of the profession, including advancing public knowledge, countering false or misleading statements (and not making them themselves), and encouraging professional development, particularly for new entrants to the profession.

Professional competence and integrity: keep up to date, conform to good practice, don't claim competence that you haven't got, accept full responsibility for your work and avoid conflicts of interest.

b) Your company is due to deliver a new water processing facility to a national water company. The facility includes real-time monitoring of chemicals and pollutants. This is a major contract for your company, but it is behind schedule and late delivery will result in heavy penalty costs. You have just been told that the company has assigned you to the project to work on the real-time monitoring sub-system. Assuming that you are an experienced programmer but have little experience of real-time systems, discuss which clauses in the Code of Conduct are relevant to this situation and how the Code might affect what you do. (13 marks)

Answer Pointers

The candidate was expected to be able to relate the Code stated in part (a) to the scenario stated in the question. It was important to be able to discuss the issues, in particular the problem of conflict resulting from different clauses. Many candidates were able to identify the key clauses and the problem of confidentiality against the need to rectify the problem, but lacked the detail necessary to have full marks. In particular many failed to discuss their actions in relation to the code. Many effectively just restated the points in the question – it is necessary to show progression from the facts to the actions.

The most obvious clauses are :

(1) members shall safeguard public health

(6) members shall endeavour to complete work on time

(8) members shall not disclose confidential information

(20)/(18) members shall do work which is within their professional competence/shall seek to upgrade their knowledge

This situation hinges on whether the public health will be at risk due to this lack of knowledge. So clause 20 is key to ensuring that the programmer raises the risk and looks to be trained in the areas required…thus also helping with 18.

As part of the team the member has the responsibility to deliver the work according to the contract, but would need to decide if the delivery date or the quality of the product was most important/most likely to cause a problem

If there is a conflict between public health and delivering the system, then clause (8) stops them going direct to the client, but the problem should be escalated up the management chain and if necessary they should seek advice from the BCS.