

THE BCS PROFESSIONAL EXAMINATIONS

Diploma in IT

October 2006

EXAMINERS' REPORT

Professional Issues in Information Systems Practice

General Comments

The pass rate was again disappointing and 30% of candidates gained marks of less than 30%. The pass rate was more or less the same for all centres with enough candidates to be statistically significant with the exception of one large centre where the pass rate was substantially lower. As usual, some candidates performed extremely well and showed a real and profound understanding of the material; as a result, they gained very high marks. Such candidates were to be found at all centres. Nevertheless, the fact that 30% of candidates who gained marks of less than 30% means that a large number of candidates were inadequately prepared for the examination and lacked the basic knowledge. This was demonstrated particularly clearly in questions 2(c), 5(b) and 6(b), each of which was straightforwardly factual and yet was answered incorrectly by very many candidates.

The examiners and the moderator are well aware that the material in this module is different in nature from the other material that candidates study and that they may therefore find it difficult or they may have motivational problems. It should be emphasized, however, that an awareness and an understanding of the issues addressed in the module is an important factor in distinguishing the professional engineer from the technician.

Question 1

1. a) The BCS Code of Conduct (2004) has four sections:

- i) The Public Interest
- ii) Duty to the Relevant Authority
- iii) Duty to the Profession
- iv) Professional Competence and Integrity.

Summarise the purpose of, and issues addressed by, each section. (Do not try to write out the code in full.)

(12 marks)

Answer Pointers & Examiner's Comments

Candidates are expected to outline the main sections in the Code of Conduct, as shown below (or the previous version), showing an understanding of how it might be applied.

The public interest: firstly this describes members' responsibility to work with due care and 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. The crux of the issue here is the potential conflict between compliance with the relevant authority's wishes, and the exercise of your judgement or compliance with external parties or legislation. If your judgement is overruled, you are encouraged to seek advice and guidance from a peer or colleague on how best to respond. [4]

This section then goes on to require members to avoid discrimination against clients or colleagues, on such grounds as race or ethnicity, and avoid various corrupt practices such as the giving or taking of bribes, misrepresentation or false claims of independent judgement. This may

be difficult when working within cultures or businesses where it is the practice to discriminate or where corruption is the norm. [3]

Duty to relevant authority: this deals with avoidance of conflicts of interest, maintaining confidentiality, and a truthful representation about products.

Commercial pressures may imply that the professional should do otherwise, such as in a pre-sales situation for a new product that still has defects. [3]

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. The problem is that incorrect statements can undermine the status of the Society / profession [3]

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. This requires members to comply with the CoGP and undertake CPD again so that their personal status and that of the profession is maintained [3]

[Syllabus section 8]

- b) 'Whistle-blowing' by employees who want to bring the perceived errant behaviour of their employer to the public's attention is a topic of some debate. Discuss when it might be appropriate for an employee to 'blow the whistle'. What direction can you draw from the Code of Conduct, employment law, or other appropriate legal and ethical sources? **(13 marks)**

Answer Pointers & Examiner's Comments

This question concerns one of the ways in which IT professionals are most likely to be faced with ethical problems. Despite this, quite a lot of candidates seemed to be unaware of the meaning of the term 'whistle blowing'.

The real question here is about employee loyalty and confidentiality. Most contracts of employment or commercial contracts highlight the need for confidentiality, but this tends to be understood as not communicating commercially sensitive information that would give its competitors an edge or using such information on leaving. For instance, consultants should not directly use the knowledge from a software project to develop a similar product.

Many ethicists believe that loyalty may not be an obligation that is absolute but relative to the situation. However, here the issue is in what circumstances can employees breach that confidentiality when they deem the employer to be negligent, immoral or illegal. The scale of the misdemeanour plays an important factor in the decision to blow the whistle, as ethical principles drawn from Utilitarianism such as the 'greater good' or Kant's 'duty regardless of consequences' can be drawn on. So when is whistle blowing permitted or required? Some examples are given by the Code of Conduct, the most obvious of which is where the public interest is put at risk such as public health and safety. Prior to any breaking of confidentiality though there should be a good attempt to raise the problem internally (e.g. via manager).

[Syllabus sections 5, 7 and 9]

Question 2

2. a) For a limited company to be registered, it must have a constitution. Part of the constitution includes the memorandum of association. Briefly describe FOUR important elements you would expect to find in a memorandum of association. (8 marks)

Answer Pointers & Examiner's Comments

1. Name of the company.
 2. The country in which its registered office is located.
 3. The objects of the company.
 4. A liability clause.
 5. The company's authorised share capital and the number and nominal value of its shares.
- (2 marks each for four of the above five).

[Syllabus section 2]

- b) You are about to set up a software development company with yourself as the sole employee. In the first year of trading you expect a modest income not exceeding £20,000. Explain why you might think it best to operate your business as a sole trader rather than a limited company. (8 marks)

Answer Pointers & Examiner's Comments

Many candidates based their answer on the premise that a limited company had to be a large undertaking involving a number of shareholders and a number of employees. This is completely false. UK law has for some years allowed single member limited liability companies, that is, companies that have a single shareholder. Even before this, many companies had only two shareholders, one of whom held only a single share and was the husband or wife of the main shareholder. Such companies are very commonly used as a trading vehicle by successful IT consultants. They protect the consultant from liability and also offer some tax advantages. Candidates were expected to realise this.

Many candidates referred to upper and lower limits on the number of members (shareholders) in a company, quoting variously two to twenty and two to fifty. The limits of two to twenty seem to derive from the limits under UK law for the number of partners in an ordinary partnership; the limits of two to fifty presumably refers to Indian law where these limits apply to private limited companies. There are no limits to the number of members of a limited company under UK law. The examiners would have accepted answers based on the law of other countries had candidates made clear that this was how they were answering the question.

A sole trader is an individual who runs their own business. There are no legal formalities attached and with a modest income of £20,000 in the first year there will be no need to register for VAT. In contrast, a limited company must provide details about itself to the Companies House and the details must be kept up to date. In addition, a limited company must produce annual accounts and an annual report. Furthermore, it is easy for directors to make blunders out of ignorance that make them liable in civil law or even in criminal law. Therefore there is less time and effort involved in running the small business as a sole trader and, in some ways, less risk, despite the unlimited liability.

[Syllabus section 2]

- c) Briefly describe the THREE principles that are fundamental to the concept of a limited company. (9 marks)

Answer Pointers & Examiner's Comments

The company has a corporate legal identity (3 marks).

The ownership of the company is divided into a number of shares. The shares can be bought and sold (3 marks).

In the event that the company incurs legal liabilities, the shareholders have no legal obligation to pay these (3 marks).

[Syllabus section 2]

Question 3

3. ABC is a company that produces specialist learning technology for primary schools. The technology comprises stand-alone units with integrated software to support the development of writing and reading skills. ABC's current balance sheet is as follows:

ABC Balance Sheet at 31 December 2005			
	(£000's)		
Fixed Assets			65
Current Assets			
Stock	50		
Debtors	150		
Cash	5		
Total Current Assets		205	
Current Liabilities			
Trade Creditors	(10)		
Tax	(25)		
Total Current Liabilities		(35)	
Net Current Assets			170
Total Assets less Current Liabilities			235
Capital and Reserves			
Share Capital – 25p ordinary shares		90	
Loan stock		30	
Profit and Loss Account		115	
Total Capital and Reserves			235

- a) With reference to the example above, explain the following terms and how they are evaluated:
- i) fixed assets
 - ii) working capital
 - iii) gearing

(12 marks)

Answer Pointers & Examiner's Comments

- i) Fixed Assets: A long-term, tangible asset held for business use and not expected to be converted to cash in the current or upcoming fiscal year, such as manufacturing equipment, buildings, and furniture (£65000 here) valued initially from value of purchase and then depreciated each year. [4]
- ii) Current Liabilities: A balance sheet item which equals the sum of all money owed by a company and due within one year (here it is £35000 – a total of the money owed to suppliers and the inland revenue) [4]

- iii) Working Capital: this is often thought of as the cash available to finance the day-to-day operations of a company, but more formally is calculated by the difference between the current assets and the current liabilities (here £170k). In a manufacturing company the working capital is likely to be larger because of the need for raw materials and work in progress prior to receiving cash for the product and needs to be managed carefully. [4]
- iv) Gearing: the relationship between loan capital and equity capital on the balance sheet (long term liabilities x100/ (share capital+ reserves +long-term liabilities)...
- so here it is $30 \times 100 / 120 = 25\%$. The loan capital comes from banks, venture capitalists, etc who receive an agreed rate of interest. High gearing indicates a high ratio of debt to equity capital and is considered undesirable by the shareholders and the lenders. [4]
- The concept of fixed assets was well understood, that of working capital less so, and that of gearing hardly at all.

[Syllabus section 3]

- b) Using the following information produce a cash flow forecast for the first six months of the following year.

The company has been selling 50 machines a month. Each unit is sold at £1,000. As a result of a recent Government initiative in schools the company is expecting to increase sales by 5 machines a month for the coming year. Additional office space will be rented at a cost of £50,000 payable in June. The tax is due to be paid in March. Debtors are currently running at 3 months' sales and are expected to continue at this level. Part suppliers allow one month credit; the cost of these parts is approximately 20% of the unit price. ABC expects to hold back enough stock at the end of each month to fulfill the expected demand from customers in the following month. Operating costs, including £3,000 depreciation, will rise to cope with this extra business as follows:

	Jan	Feb	Mar	Apr	May	Jun
	31,000	33,000	33,000	35,000	35,000	37,000

(13 marks)

Answer Pointers & Examiner's Comments

	Jan	Feb	Mar	Apr	May	Jun
Income	50	50	50	55	60	65
Expenses						
Operating costs	(28)	(30)	(30)	(32)	(32)	(34)
Tax			(25)			
Rent						(50)
Creditors(Parts)	(10)	(11)	(12)	(13)	(14)	(15)
Cash flow	12	19	(17)	10	14	(34)
Balance BF	5	17	36	19	29	43
Balance CF	17	36	19	29	43	9

2 marks for the method of producing a cash flow, 5 marks for extracting the numbers from the description [operating costs (less depreciation); tax; rent; income based on debtors; cash balance], 2 marks for the balances calculated from actual numbers used.

[Syllabus section 4]

Question 4

4. a) Explain the law relating to the sending of 'spam' to individuals within the European Union. (8 marks)

Answer Pointers & Examiner's Comments

Unsolicited e-mail can be sent to individuals (as opposed to companies) only if they have previously given their consent. It is unlawful to send unsolicited e-mail that conceals the address of the sender or does not provide a valid address to which the recipient can send a request for such mailings to cease. If an email address has been obtained in the course of selling goods or services, the seller may use the address for direct mailings, provided that the recipient is given the opportunity, easily and free of charge, with every message, to request that such mailings cease.

Some candidates seemed to think that the law meant that unsolicited e-mail can only be sent to individuals and not to companies.

- b) How does this law differ from the corresponding law in the USA? (5 marks)

Answer Pointers & Examiner's Comments

In the USA, it is legal to send spam provided that the person sending the spam has not been informed by the recipient that they do not wish to receive spam and the spam contains an *address* that the recipient can use to ask that no more spam be sent. Very few candidates seemed aware of this.

[Syllabus section 7]

- c) Discuss how far the UK Computer Misuse Act 1990 enables action to be taken against those who create or spread viruses and other harmful software, or who launch denial of service attacks. (12 marks)

Answer Pointers & Examiner's Comments

The Act creates three new criminal offences: unauthorized access to a computer, unauthorized access to a computer with intent to commit a serious time, and unauthorized modification of data or programs in a computer system.

Pretty well any dissemination of 'malware' involves unauthorized access to a computer system and, if it is to be harmful, it involves unauthorized modification of data and/or programs, which is the more serious offence.

What the Act doesn't do is provide a means of taking action against those who perpetrate denial of service attacks since these don't constitute unauthorized access or modification. Few candidates seemed aware of this limitation.

[Syllabus section 5]

Question 5

5. a) Explain what is meant by the term *outsourcing*.

(4 marks)

Answer Pointers & Examiner's Comments

Handing the complete responsibility for a complete project or an on-going activity or group of related activities over to another organization that specializes in such activities, for a fixed period, agreed payment and agreed level of service.

Many candidates interpreted outsourcing as using freelance contractors. While a little credit was given for this, the essence of outsourcing as the term is currently used is that responsibility for a substantial activity is being handed over. The idea of a fixed period, agreed payment and agreed level of service were often omitted.

b) What reasons might an organization have for outsourcing its IT provision?

(5 marks)

Answer Pointers & Examiner's Comments

IT requires a lot of professional skills and a company that specializes in IT is likely therefore to be able to do a much better job than can one or two IT people employed in a user company. Furthermore, the IT specialist company will be able to deploy highly specialized staff for short periods as required. It can offer better career prospects to specialists and therefore get better staff. All this means that the outsourcing company should be able to provide a substantially better service at no greater cost. Furthermore, the problem of jealousy resulting from the high salaries of IT people will be avoided.

c) What protection does European law offer to employees who are transferred to a different employer as a result of outsourcing?

(4 marks)

Answer Pointers & Examiner's Comments

Under the TUPE directive, employees automatically become employees of the new employer under the same terms and conditions as they were employed by the old employer. It is as if their original contracts of employment had been made with the new employer. Representatives of the employees affected by the transfer have the right to be informed about the transfer and they must be consulted any measures that either employer is considering taking that concern such employees.

Very few candidates seemed aware of the TUPE directive and many answered the question erroneously by citing the Data Protection Act or Health and Safety legislation.

[Syllabus section 9]

d) Explain the difference between *direct discrimination* and *indirect discrimination*, illustrating your answer by suitable examples from at least two areas of discrimination.

(12 marks)

Answer Pointers & Examiner's Comments

Most candidates had no idea of the meaning of these terms and, indeed, had little idea of what is meant by discrimination. Many candidates said that discrimination involved physical or mental pain; this is wrong. The essence of discrimination is treating one person less favourably than another for irrelevant or illegitimate reasons.

Direct discrimination occurs when one person is treated less favourably than another specifically on grounds such as sex, religion or race. Thus, if a woman does exactly the same job as a man but is paid less simply because she is a woman, this is direct discrimination. If a company advertises for a secretary but rejects all non-white applicants simply because they are not white, this is direct discrimination.

Indirect discrimination occurs when conditions are imposed that apply to everyone but have a disproportionate effect on one group. Advertising a job with the requirement that applicants must speak Urdu is indirect discrimination because it favours applicants from a particular racial group. It may, of course, be permitted if it is genuinely a requirement of the job. Another example is that

a policy of giving priority to the children of existing tenants when allocating public housing constitutes indirect discrimination because it discriminates against racial groups that have only recently arrived in the country.

[Syllabus sections 5 and 9]

Question 6

6. a) In relation to a computer game, explain the activities that are unlawful under the law of copyright. **(8 marks)**

Answer Pointers & Examiner's Comments

Except as provided below, the following activities are unlawful:

- making a copy of the game;
- issuing copies of the game to the public, whether for money or not and whether for sale or rental;
- making an adaptation of the game (e.g. translating any text into a different language);
- decompiling the program.

[Syllabus section 6]

b) The UK Copyright, Designs and Patents Act 1988 allows certain specific exceptions to the prohibited activities. What are they? **(8 marks)**

Answer Pointers & Examiner's Comments

- Decompiling the software in order to correct errors.
- Decompiling the game in order to make it interwork with other software.
- Making a single copy for back-up purposes.
- Selling on your own licence to use the game.

[Syllabus section 6]

c) Explain what is meant by the 'database right' and how it differs from copyright, illustrating your explanation with a suitable example. **(9 marks)**

Answer Pointers & Examiner's Comments

Many candidates had no idea what is meant by the database right and invented ingenious but incorrect explanations. Many candidates also confused the term 'database' with 'database management system'. Access is not a database, it is a database management system, and to confuse the terms is an egregious error.

There are many databases that cannot be regarded as constituting the author's own intellectual creation and so do not qualify for copyright protection. Nevertheless, they represent a lot of work and clearly merit some protection. Examples of such databases include databases of street names or CDs. The database right was introduced to protect databases where 'there has been substantial investment in obtaining, verifying or presenting the contents of the database'. The database right lasts for 15 years from the production of the database (as opposed to the much longer period of 70 years from the death of the author in the case of copyright) and prevents anyone from extracting or reusing all, or a substantial part of, the database without the author's permission.

[Syllabus section 6]