

THE BCS PROFESSIONAL EXAMINATION
BCS Level 5 Diploma in IT

October 2010

EXAMINERS' REPORT

Professional Issues in Information Systems Practice

General comments on candidates' performance

The examiners were pleased to see an improvement in the pass rate at this sitting. Many candidates were, however, still woefully ill prepared for the examination, with around 20% of candidates at two of the largest centres getting less than 10%. There is a marked difference in performance among the different centres. The largest centre achieved a pass rate of 45%, while the next two had pass rates that were less than half that. The next two largest centres had pass rates in the high fifties.

The examiners can only speculate as to the causes of the differences in performance from centre to centre, since the larger centres all have candidates coming from a wide range of different course providers.

Certainly for the 23% of candidates who gained less than 20%, the primary cause of their failure was either lack of knowledge or lack of the necessary intellectual or linguistic skills to understand the material or write down their answers. The same probably applies to most of the further 20% of candidates who scored between 20% and 30%.

The commonest single cause of failure among candidates with marks in the 30s was a failure to address the question asked. Answers to questions 4(a), 5(b) and 6(a) were particularly subject to this weakness. It is recommended that course providers bring these examples to the attention of their students and give them practice in identifying what exam questions are asking for.

As usual, however, 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.

Question 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 the issues addressed by, each section.
(Do not try to write out the code in full.)

(16 marks)

Answer pointers

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.

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.

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.

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

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 .

- b) It can happen that an employee finds that his or her employer is behaving in an illegal fashion and wishes to draw the attention of regulatory bodies or other authorities to this behaviour

When is it appropriate for the employee to breach the confidentiality provisions of his or her contract of employment? What guidance can you draw from the BCS Code of Conduct, employment law, the Public Interest Disclosure Act or other appropriate legal and ethical sources?

(9 marks)

Answer pointers

The real question here is about employee loyalty and confidentiality. Most contracts of employment or commercial contracts include a confidentiality, clause 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.

(3 marks)

Many ethicists believe that loyalty may not be an obligation that is absolute but relative to the situation. However, here the issue is whether that confidentiality can be broken by the employee when they deem the employer to be negligent, immoral or illegal. The scale of the offences 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).

(3 marks)

The Public Interest Disclosure Act 1998 provides limited protection for employees who raise concerns about criminal behaviour, certain types of civil offences, miscarriages of justice, activities that endanger health and safety or the environment, and attempts to cover up such malpractice.

The Act protects employees who make disclosures about such malpractices to their managers or to certain prescribed regulatory bodies such as the Health and Safety Executive or the Financial Services Authority, provided the disclosure is made in good faith and that the employee has reasonable grounds for making the allegation.

(3 marks)

[Syllabus sections 1e and 1h]

Examiners' comments

This question was attempted by 80% of candidates, some 35% of whom gained a pass mark. Part (a) was comparatively well answered, with many candidates showing an understanding of the sections of the BCS Code of Conduct. Part b) was answered poorly. Candidates failed to understand the desirability of raising the matter internally and seemed unaware of the relevance of the Public Interest Disclosure Act.

Question 2

- a) Briefly explain the terms **recruitment** and **selection** and distinguish between them.

(5 marks)

Answer pointers

Recruitment refers to the methods of attracting candidates to the organisation. Selection is the process of choosing the successful candidates from those who applied.

- b) The documentation usually required when recruiting a new employee has three components:
- i) a job description, that is, a description of the tasks that the person appointed will be expected to carry out;
 - ii) a person specification, that is, a description of the qualifications, experience and other characteristics that will be looked for in the person appointed;
 - iii) the contractual terms and conditions that will apply to the appointment.

Give an example of each component for the recruitment of a systems analyst, or similar professional, in an organisation of your choice.

(20 marks)

Answer pointers

The answer will depend on the nature of the job and the organisation the candidate chooses. The following is an example that relates to a financial services organisation.

Job description

Job title: Systems Analyst

Reports to: Head of IS development

Subordinates: Junior systems analyst and analyst/programmer

Responsibilities/main tasks:

- Analysis of business requirements,
- assist users with the production of requirements specification,
- produce systems specification,
- determine fit with current system,
- select appropriate solution (e.g. package, bespoke development, enhance current system) and
- supervision of junior systems analyst and analyst/programmer.

(8 marks)

Personal specification

Qualifications: degree or equivalent in a business or IT related discipline.

Knowledge: good knowledge of the financial services industry and an in-depth knowledge of SSADM.

Experience: five years development of financial services information systems.

Personal attributes: analytical, organised, methodical and an excellent communicator.

(6 marks)

Terms and conditions.

Hours: 35 hours per week.

Holidays: 4 weeks per annum.

Salary: £45,000 per annum

Fringe benefits: Defined contribution pension scheme, Bupa, luncheon vouchers, financial support for further study, payment for membership of professional bodies.

(6 marks)

[Syllabus section 1i]

Examiners' comments

This question was attempted by 72% of the candidates and 55% of those attempting it gained a pass mark. It was answered better than any other question on the paper. The weaker candidates confused the three different documents in part (b) and/or gave vague and imprecise examples.

Question 3

A new start-up organisation, M-Web, has been established by two software professionals. They are developing a mobile phone application for searching the web informed by the current location of the user.

- a) Discuss whether the organisation should be formed as a partnership or a limited company.

(13 marks)

Answer pointers

The nature of the organisation's business means that it will need capital. By its nature, a partnership cannot raise equity capital and it will find it very difficult to raise loan capital. A partnership is therefore only feasible if the two partners can raise fairly large amounts of capital themselves. (3 marks)

If this is the case, a partnership may seem preferable because:

- there are no formalities involved in setting it up, because it comes into existence automatically when the two professionals start working together; (2 marks)
- there are no requirements for formal reporting, which reduces the administrative load and limits the extent to which competitors can gain information about the organisation. (2 marks)

However, these are short term advantages and are easily outweighed by the advantages of a limited company:

- capital can be raised through issuing shares; (2 marks)
- in the event that the company incurs debts or other legal liabilities, the shareholders (including the founders) of the company have no obligation to pay these; (2 marks)
- because the ownership of the company is divided up into a large number of shares, it is easy to vary the proportions owned by different people, in the light of their contributions (financial or in kind) to the company. (2 marks)

- b) The application will be given away free but businesses will be charged for advertising their products or services as a preferred site. The company is developing a business plan based on two options.

The first option has the application working on only a limited range of mobile phones; the development cost and the investment in marketing would be lower than for the second option, but so would be the number of users.

The second option is to develop an enhanced application that will work on a wide range of mobile phones. The development cost would be higher and so would the marketing cost but there would be more users than for option 1.

The initial cost of developing the software for option 1 will be £85,000, with a maintenance cost estimated at £5,000 per year. For option 2, the development cost will be £120,000, with maintenance at £10,000 per year. The marketing costs are approximately £2 per user per year.

Income is estimated to be £4 per user per year.

Develop a simple cash flow projection for four years using the following data and, ignoring the time value of money, calculate the payback period for each option assessing which would be better.

(12 marks)

Answer pointers

Year	Option 1 Number of users with low level of marketing	Option 2 Number of users with high level of marketing
1	5,000	20,000
2	15,000	50,000
3	30,000	80,000
4	50,000	100,000

Option 1

	0	1	2	3	4
Income	0	20	60	120	200
Costs					
Development/ maintenance cost	85	5	5	5	5
Marketing	0	10	30	60	100
Nett cash flow	(85)	5	25	55	95
Cumulative cash flow	(85)	(80)	(55)	0	95

Payback after 3 years

(5 marks)

Option 2

	0	1	2	3	4
Income	0	80	200	320	400
Costs					
Development/ maintenance cost	120	10	10	10	10
Marketing		40	100	160	200
Nett cash flow	(120)	30	90	150	190
Cumulative cash flow	(120)	(90)	0	150	340

Payback after 2 years.

(5 marks)

Payback is faster under option 2 and income better thereafter, so preferred option is option 2.

(2 marks)

[Syllabus sections 1b, 1c and 1d]

Examiners' comments

Forty-eight per cent of candidates attempted this question and 50% of those who attempted it achieved a pass mark.

In part (a), candidates on the whole appeared to understand the differences between partnerships and limited companies. The answers tended to focus on the liability issues. Many thought that a partnership was better simply because there were two people involved. Others showed that it might begin as a partnership and progress to being a limited company, which is a fair position. Candidates would have done better to expand their views and justify the position they took

Overall, candidates who answered this part of the question did well, and clearly understood the process and so scored well. Some did not lay out the data to make it clear what the cash flow was each year. Others tried to assess the pay back period using other approaches. Some candidates did not realise the "marketing" costs were in both. The method and layout of the data were also given marks.

Question 4

- a) Explain the difference between copyright and trademarks as they affect the protection of software.

(12 marks)

Answer pointers

Copyright prevents others from copying, issuing or amending software that it covers. In practice this applies to almost all software. Copyright comes into existence automatically and, in the UK, does not need to be registered.

The practical effect of this is that copying software without permission is forbidden. One-off copying can give rise to a civil action leading to the award of damages or a court order to desist. Commercial copying can be a criminal offence

(6 marks)

A trade mark is any sign capable of being represented graphically which is capable of distinguishing goods or services of one undertaking from those of other undertakings. It could be a logo or similar device used on the cover of a CD or it could be a logo displayed when the software is loaded.

It is a criminal offence to use a trade mark without the owner's permission and hence it prevents other people from passing off software as produced by the trade mark's owner.

A trade mark needs to be registered in each jurisdiction in which protection is sought, although in some cases and in certain jurisdictions a civil remedy may be available even if the trade mark is not registered.

(6 marks)

- b) Describe the protection that the UK Data Protection Act 1998 offers to data subjects.

(13 marks)

Answer pointers

The UK Data Protection Act 1998 provides the following protection for UK citizens:

The right of access to any personal data about himself/herself held by organisations.

(3 marks)

The right to have inaccurate personal data held by an organisation amended to correct any inaccuracies.

(3 marks)

The right to have personal data deleted after it is no longer necessary for it to be kept by the organisation.

(3 marks)

Protection of the above rights is enforced by fines being imposed on organisations that contravene the above rights, and in some cases possible prison sentences for those responsible.

(4 marks)

[Syllabus sections 1e and 1f]

Examiners' Comments

Ninety-four per cent of candidates attempted this question but only 29% of those attempting it achieved a pass mark. Most candidates had at least some understanding of copyright and trade marks. In part (b) however, many candidates simply listed, usually inaccurately, the eight data protection principles, while others confused the Data Protection Act with the Freedom of Information Act.

Question 5

- a) Borth Data Services (BDS) is a multinational organisation that specialises in the provision of outsourced IT services; it is a highly centralised organisation. Cambrian Software Limited (CSL) is a multinational organisation that specialises in the development of large and complex software systems; it is a highly decentralised organisation.

Describe TWO practical effects that a project manager or senior systems architect would notice on moving from one company to the other.

(13 marks)

Answer pointers

There are many possible examples that could be cited. Two suitable examples are given below.

BDS has standardised on a set of software development tools (DBMS, programming language, configuration management system, operating system, test harness, etc) that are used for all projects, and also a set development procedures and a life cycle model. All development staff are familiar with these and can move easily from project to project. BDS has contracts with the suppliers of these tools that mean they are available at a very competitive price. However, the tools and standards are not always the most appropriate ones for a particular project and in some cases are out of date. Nevertheless, the project manager or system architect has no authority to use other tools or procedures that might be more appropriate to the project.

In CSL the choice of software tools and methods is specific to the individual project, although there is a range of products from which the choice is usually made. This means that the project manager and system architect have to spend a significant amount of effort deciding what tools to

use for a project and customising procedures and standards to meet the project's needs. Staff joining the project often need training and a few weeks' experience before they can function effectively. However, most projects are completed on time and to a high standard because the tools are very appropriate.

Human resources policy in BDS is very rigid. While this results in a general sense of fairness, since everyone is treated the same, it means that project managers cannot take into account individual circumstances, for example, personal circumstances when staff are required to work away from home for long periods or the need to prevent key staff from leaving.

In CSL, project managers have a great deal of discretion in these matters and the sympathetic way that they are treated mean that most staff are very loyal to the company. However, individual project managers inevitably deal with personnel issues in different ways and this often leads to accusations of unfairness.

- b) Many global organisations have tried introducing a matrix structure to balance the power of their functional and divisional groups. This has often created problems and led them instead to implement a hybrid form of divisionalised structure.

Identify THREE problems that these organisations may have experienced with their matrix structures.

(12 marks)

Answer pointers

Too much management time was spent on trying to co-ordinate tasks across countries.

The existence of two bosses (located in separate countries) diluted accountability of employees and lead to high stress levels among managers and employees alike.

Conflict between various managers arose – functional managers tried to dominate product managers, product managers tried to dominate regional/country managers, and so forth.

(4 marks for each)

[Syllabus sections 1b and 1i]

Examiners' comments

Attempted by only 30% of the candidates, this was by far the least popular question on the paper; 36% of the candidates attempting it gained a pass mark. Many answers to part (a) simply explained centralisation and decentralisation. This is not what the question asks for. The answers to part (b) were much better.

Question 6

- a) Explain the criminal offences that might apply to creating and distributing malware, such as computer viruses, worms, Trojan horse software and spyware.

(12 marks)

The UK Computer Misuse Act 1990 provides three criminal offences that could be used against such an individual:

Unauthorised access to an organisation's computer systems by means of Trojan horse software and spyware.

(3 marks)

Unauthorised access to an organisation's computer systems with the intent of committing a further crime such as fraud. This could potentially apply to Trojan horse software and spyware.

(3 marks)

Unauthorised modification of data and /or programs within an organisation's computer systems. This would typically apply to computer viruses and worms.

(3 marks)

In addition to these three specific offences, it may well be that other offences, in particular, criminal damage, may apply.

(3 marks)

- b) A UK police force is investigating a case of suspected fraud by a criminal gang. It has identified the Internet service provider used by one of the gang members. Outline the responsibilities of the Internet service provider under the UK Regulation of Investigatory Powers Act 2000 with regard to the police investigation.

(13 marks)

The ISP is required to collect communications data and keep it for a minimum period of six months. Communications data is described as the 'who', 'when' and 'where' of a communication; it includes, for example, the date, time, source and destination addresses of an e-mail but not its content.

(4 marks)

The ISP is required to maintain the capability of providing covert access to the content of communications emanating from, or destined for, specific addresses.

(3 marks)

These are general obligations that apply to all communications not simply to ones in which the police have expressed an interest.

(2 marks)

In the scenario described, the police require access to the retained data for the purpose of preventing crime. This is a legitimate ground for having access to the data so, on receipt of an appropriately authorised request from the police, the ISP must provide all the relevant communications data that it holds, and to continue releasing this data as it is gathered. Similarly, the ISP must also, if requested, grant the police covert access to the content of specified communications.

(4 marks)

[Syllabus sections 1e and 1g]

Examiners' comments

Seventy per cent of the candidates attempted this question and 40% of those attempting it gained a pass mark. Candidates generally answered part (a) well showing an appreciation of the relevance of the Computer Misuse Act. Many candidates answered part (b) poorly, failing to discuss how the Regulation of Investigatory Powers Act would apply.