THE BCS PROFESSIONAL EXAMINATIONS
BCS level 5 Diploma in IT

September 2012

IT Project Management

EXAMINERS' REPORT

Section A

A1.   Your company needs a better stock control system. It has decided to acquire the Stock-in package and amend this to meet its requirements. It has set up a project board and you have been appointed project manager. You will need to assemble and manage a joint team of internal company staff and external technical specialists for the various aspects of this project. It is the first such IT project that your company has undertaken.

The stock department manager has nominated three members of the department. They will help with the design and testing of the new system. An outside agency will supply four technical staff to help with programming and analysis work. These technical staff will become available at various times over the next few weeks, once they have completed their current assignments.

In addition a technical consultant from the Stock-in package suppliers will be based in your office for two weeks immediately after the design phase has been completed. This consultant will help install the amended package onto your system.

You have been allocated a small basement office, designed for just four people, near the canteen. It is a long way from the company's warehouse and stock control office.

a)   What are some of the team issues that you would expect to deal with during the early stage of the project?   **(8 marks)**

b)   Name and describe briefly THREE management styles.   Identify THREE groups of people involved in the development of the project described above, and discuss which of these three styles would be most appropriate for you to use to manage each of these groups. **(8 marks)**

c)   Define what is meant by a 'project stakeholder'.   List at least SIX different individuals or groups of people who might be stakeholders in this project. Some, but not all, of these may have been mentioned above. **(5 marks)**

d)   Select THREE from the list of stakeholder types that you have listed in part (c) and explain briefly their likely attitude to the project.
                      (4 marks)

Answer Pointers

a) **2 marks** were awarded **each** for a good explanation of up to **4 different** team issues that the project manager might expect to deal with early in the project. These could include:

- The normal pattern of forming/storming/norming/performing may be disrupted as new people join the group.
- Virtual Teams do not bond as quickly as physically co-located teams.
- There maybe tension between internal staff and external contractors, exacerbated by pay, hours etc.
- This will all take place in a very crowded space, isolated from the rest of the company

Total =   8 marks

b) **1 mark** for naming and describing briefly **each** of the standard identified management styles:
> Task-orientated
> Relationship-orientated
> Consultative

Note that similar marks were also awarded for a good explanation of the alternative three X, Y, Z styles   **Up to 3 marks**

A **further two marks** for naming the three different team groups involved in the project, which are:
> The 3 users (internal staff)
> The 4 agency technical staff
> The technical consultant from the package suppliers

Plus **a further three marks** for a sensible description, with reasons, of an appropriate style for managing each group. Good choices here might be:
> Task-orientated for the users
> Relationship-orientated for the technical staff
> Consultative for the external consultant

Total: 3 + 2 + 3 = 8 marks

c)   The formal definition of a Stakeholder is anyone with a valid interest in, or affected by, an IT project (1 mark for this aspect) or the products delivered by the completed project (1 mark for this further aspect).   **2 marks**

In this specific project scenario, the stakeholders would include:

The project board
The three different team groups, as above, in the project team, i.e:
> Users
> Agency staff
> Technical consultant

Other members of the user (stock control) department
The package supply company
Stock suppliers
Stock customers

You – the project manager

And the question asked here for 6 different individuals, or groups of individuals, to be listed

3 marks

Total: 2 + 3 = 5 marks

d)   Up to 4 marks awarded for a sensible description of the likely (different) concerns, stakes and attitudes (which could be positive or negative) for the three selected different stakeholders

Total =   4 marks

Examiners' Guidance Notes

General

This question set out a very specific project scenario. It expected candidates to apply their knowledge and understanding of team-related and stakeholder-related ITPM topics to this scenario.   Disappointingly, many of the answers were somewhat generalised discussions of various principles of IT team building and team management, but without any clear reference to this project, and those involved in the project.

a)   Many answers tended to concentrate on various actions that could be taken to help build a working team rather than the issues that might require such actions, bearing in mind the very different backgrounds, knowledge and experience of the members of this team – together with the cramped and isolated location of the project office.

b)   This section of the question was rarely answered well, and generally there appeared to be a lack of understanding of the three "standard" management styles.   Many answers concentrated more on management structure, identifying the different levels of management, whilst others referred to motivation theory and methods – neither of which are really relevant to the question. The words "…for you to use to manage each …." are key to this part of the question.

c)   Definitions of "stakeholder" were usually sound, though the second aspect (affected by the outcome of the project, though not involved in the development of the project itself) was often omitted. In this project scenario the project team itself really comprises three clearly different types of stakeholder as each group's involvement in (and relationship to) the project and its eventual success or failure is entirely different.   Often the lists provided tended not to make such distinctions. Frequently these lists were too generalised and not related specifically to those involved in this project.

d)   The discussion here needed to identify the concerns that each stakeholder might have about the project, and the effect that project success or failure might have on each individual's future work – leading on to their general attitude (positive or negative) to the project. Many answers missed this point entirely and often concentrated more on each individual's "involvement" (or job responsibility) within the project, or the project objectives. Again several answers were not directly related to this project scenario.

A2. A small research organisation has decided to extend and replace its existing database system. The project has received board approval and the required functional changes and additional requirements have been agreed with the users. A project manager has been appointed and has been allocated a project team of three database analysts, three development programmers and one tester, with selected users being made available for acceptance testing.

An outline project schedule for the development and implementation phases has been drawn up. It includes the following tasks and related staff allocations:

A	Define required new database functionality	4 weeks	Database analyst DA1
B	Define new data entry and update requirements	3 weeks	Database analyst DA2
C	Define new data analysis and report outputs	3 weeks	Database analyst DA3
D	Define database transfer rules	2 weeks	Database analyst DA3
E	Code and test extended database tables and schema	2 week	Programmer P4
F	Code and test new data entry and update routines	2 weeks	Programmer P5
G	Code and test data analysis and report routines	4 weeks	Programmer P6
H	Code and test data base transfer routines	1 week	Programmer P4
I	Test and trial the data transfer routine	1 week	Tester T1 & Programmer PR4
J	Integration Testing	3 weeks	Tester T1 & Programmers P4,P5 and P6
K	Acceptance testing	3 weeks	Tester T1 & Users

Tasks A, B, C and D can all start at the same time, although this will depend also upon staff availability.
Task E is dependent solely on task A
Task F is dependent solely on task B
Task G is dependent solely on task C
Task H is dependent solely on task D
Task I is dependent solely on Task H
Task J cannot start until tasks E, F, G and I are completed
Task K is dependent solely on task J

a) i) Draw a Gantt chart showing all eleven tasks and their dependencies, allowing for the resource allocations as indicated above

ii) Use this Gantt chart to identify the minimum duration for the project, and to list the float for each task

iii) Identify any free float and describe how this is different to any other type of float

(12 marks)

b) Shortly before the start of the project Analyst DA2 and Programmer P5 both resign from the company. No replacements are available. You must re-allocate existing project staff to the tasks concerned in the most efficient way. Describe and justify the changes to the Gantt chart. State the new minimum duration for the project.
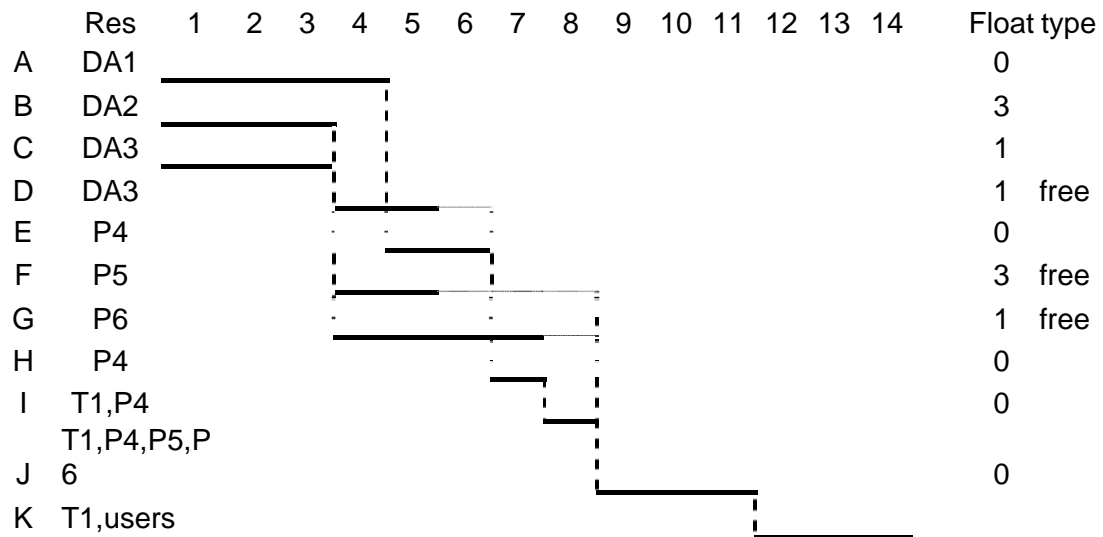
(8 marks)

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c)	Identify and explain briefly TWO advantages and TWO disadvantages of using a Gantt chart for a project plan in comparison with using an activity-on-arrow diagram.

(5 marks)

Answer Pointers

a)	A Gantt chart was expected here similar to:

	Res	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Float type	
A	DA1															0	
B	DA2															3	
C	DA3															1	
D	DA3															1	free
E	P4															0	
F	P5															3	free
G	P6															1	free
H	P4															0	
I	T1,P4															0	
J	T1,P4,P5,P6															0	
K	T1,users																

And noting that the resources are named in column 2 and the time periods are weeks.

Up to 5 marks were awarded for a clear Gantt chart showing the correct structure and task dependencies bearing in mind the resource restrictions.
A further: 	**2 marks** for displaying the resources against each task
	3 marks for calculating correctly the minimum duration (14 weeks) and the float for each task, and
	2 marks for identification and discussion of float type

Total: 5 +2 + 3 + 2 = 12 marks

b)	One possible reallocation of resources is shown below, some others are equally valid.

A	Define required new database functionality	4 weeks	Database analyst DA1
B	Define new data entry and update requirements	3 weeks	Database analyst DA3
C	Define new data analysis and report outputs	3 weeks	Database analyst DA3
D	Define database transfer rules	2 weeks	Database analyst DA1
E	Code and test extended database tables and schema	2 week	Programmer P4
F	Code and test new data entry and update routines	2 weeks	Programmer P4
G	Code and test data analysis and report routines	4 weeks	Programmer P6

H	Code and test data base transfer routines	1 week	Programmer P6
I	Test and trial the data transfer routine	1 week	Tester T1 & Programmer P4
J	Integration Testing	3 weeks	Tester T1 & Programmers P4 and P6
K	Acceptance testing	3 weeks	Tester T1 & Users

Up to 4 marks awarded for a re-drawn chart, or another form of resource allocation diagram, with a **further 3 marks** for a clear description of how and why the resources are re-allocated in this way. **1 mark** for the new minimum duration arising from a correct re-allocation

Total: 4 +3 + 1 = 8 marks

c) The main advantages of using a Gantt chart when compared with an activity-on-node diagram could include two of:

Easier to show tasks against a time scale, plan holidays, etc
More likely that non-technical staff (e.g. senior management) will fully understand it (and its implications)
Easier for resource scheduling,
Float is shown on the diagrammatically

The main disadvantages could include:

It is not so easy to show task dependencies clearly
Not so easy to amend, and thus re-calculate values (e.g. usually have to re-draw a Gantt chart)
It is not possible to show the other task values (such as earliest and latest start/end dates) on a Gantt chart.

2 marks for a valid/correct list of sensible advantages/ disadvantages, plus 3 marks for sound explanations

Total: 2+3 = 8 marks

Examiners' Guidance Notes

General
Gantt charts are used widely in project management and the overall quality of answers to this question was quite disappointing, often displaying a limited knowledge and understanding of the key requirements for a clear informative chart. In particular, either or both of the task dependencies and the resources allocated to each task were often omitted completely, nor was the critical path highlighted.

Many candidates preferred to draw a quite detailed A-on-N or A-on-A diagram to establish the dependencies and (often) the critical path before drawing the Gantt chart required by the question. This often led to the resource allocations then being overlooked (as well as expending valuable examination time). No marks were awarded for such A-on-N diagrams.

a) Resource allocation is the key part of this question, but this was overlooked by a significant number of candidates who:

(i) did not display the resources required for each task clearly in the chart, **and/or**
(ii) often scheduled simultaneously two or more tasks requiring the same resource (e.g. tasks C and D, tasks E and H).

The minimum duration should have been clear from a correct Gantt chart, but was not always stated separately nor was task float listed. In general there appeared to be a very limited understanding of free float and its interpretation.

b) This part of the question required the candidate first to identify the available (correct) resources to take over the DA2 and P5 tasks (e.g. should DA1 or DA3 take over DA2's task – and why?) and then re-schedule so that (again) no resource is scheduled to different tasks simultaneously. Again many

candidates overlooked this, and stated that the minimum duration would be unchanged. A simple resource/task block chart can help here.

c) This required just **two** advantages and **two** disadvantages, with sound clear explanations. Several candidates listed more than two of each, with no (or very weak) explanations of any.

A3. You work for a small software house which has won a contract with a new client to design, develop and implement a replacement database system. The client is a medical research organisation and has a very small IT section. Your company has little experience in the client's business area. Your company has decided to use a new rapid development method for this project, and you have been appointed project manager.

    a) Explain the difference between project and business risk. Give THREE examples of EACH type of risk from those that might affect your company when undertaking the IT project described above.

(8 marks)

    b) List and explain the TWO factors used in evaluating risk exposure. Discuss how each of these factors might be measured numerically.

Draw up a table illustrating the calculation of risk exposure for the THREE *project* risks identified in part (a) and the way risk exposure is used to prioritise the risks.

(12 marks)

    c) In some projects, the factors used in the calculation of risk exposure cannot be measured *numerically*. Discuss the way in which the factors could be assessed *qualitatively* and how these qualitative assessments could be used to prioritise risks.

(5 marks)

Answer Pointers

a) Business risks are **external** to the project and its activities
Project risks **relate directly** to the project and its activities

1 mark each = 2 marks

Examples of possible Business risks could include:
- Reduced (government) funding for medical research may cause the client to cancel the project
- The client may discover a suitable (and cheaper) off-the-shelf package
- There might be some sudden changes in the type of research that the client is required to undertake

Up to 3 marks

Examples of possible Project risks could include:
- Staff departure (perhaps key client staff but mainly your own staff)
- The rapid development method is more complicated to use than anticipated
- Key requirements are misunderstood by **your** (software house) staff, due to their inexperience in this market sector.

Up to 3 marks

All these risks needed to be directly related to the client, client's business and project outlined for this question.

Total   2 + 3 + 3 = 8 marks

b)   The TWO main factors used when evaluating exposure are:

probability
impact

1 mark each = 2 marks

Probability is usually measured **numerically** by assessing the percentage chance of the risk occurring. For example, a 10% (or 0.1) probability means there is a 1 in 10 chance of the risk occurring .Often, risks are assessed as being in a range of possible percentage probabilities . e.g. more than 50%, 30-50%, 10-29%, under 10%.
(these ranges could then be classified as, say, high, significant, moderate or low)

2 marks

The **measurement** of impact is a little more complex as you need to consider cost, scope and time. Where possible these are converted into a financial cost of the damage created.
Again the numeric values of financial loss can be assigned to ranges described as high, significant, moderate or low

Up to 4 marks, bearing in mind the 3 sub-factors that comprise impact

Risk exposure is calculated simply by multiplying probability and impact. A table was expected here demonstrating this. It should show the two factors, and their product, for each of the selected 3 **projec**t risks.

Up to 4 masks for a correct table with sensible factors and their product.

Total   2 + 2 + 4 + 4 =12 marks

c)   The most widely used method for assessing risk qualitatively is the probability impact grid (or summary risk profile). These can then be prioritised by use of a tolerance line

Up to 5 marks for a clear diagram, showing the tolerance line

Examiners' Guidance Notes

General
This was by far the least popular question in Section A and generally not answered at all well, showing very limited knowledge and understanding of the key elements of risk, assessment, evaluation and prioritisation.
As in the previous Section A questions some candidate's answers were very generalised and not related at all to the scenario set out in the question. Several answers concentrated more on risk management, rather than assessment and prioritisation.

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a) The distinction and difference between the two risk types was rarely explained well, with poor examples which (very often) confused the two types. Candidates needed to distinguish between those risks that:
- affect the client and the client's business and the client's business sector,
- are related directly to the project, the project staff and team, and its development.

b) This section was based almost entirely on the numerical measurement of risk, but very few candidates quoted, say, the use of %-ages as a numerical measurement or the use of some form of numerical scale. The actual calculation of risk exposure was rarely mentioned, although outline risk exposure tables were sometimes provided as an answer to part c).

c) This part of the question required a clear understanding of the difference between numerical measurement and qualitative measurement but very few candidates were able to provide this. Very few answers incorporated a probability impact grid. The "tolerance line" was not mentioned at all.

Section B

B4. You are the newly appointed project manager for a software development project that is running late. You ask the previous project manager what the causes of the delay are and she gives you three answers.
- Staff originally allocated full-time to the project sometimes work on emergency maintenance of other applications.
- The original estimates of effort were over-optimistic.
- Productivity is lower than expected.

Before you take any action you want to check the project control processes.

a) Identify the three control processes that you could use to prove each of the three causes that have been identified.
(9 marks)

b) Write a memo to the project board explaining four options for dealing with the delay to the project. **(8 marks)**

c) One possible result of a delay is an exception report. What are the contents of an exception report?
(8 marks)

Answer Pointers

a) Identify the three control processes that you could use to prove each of the three causes that have been identified.

(i) Timesheets will record work actually carried out on the project and work carried out on non-project activities. The problem of non-project work

bleeding resources from a project may initially be suggested when the actual effort on an activity is seen to be less than that planned.

(ii)   The original estimates of development effort were over-optimistic;
Actual effort will be greater than planned effort for many activities in this case. If measured productivity (e.g. measured as lines of code per day) is as expected this may indicate that the size of tasks is greater than expected.

(iii)   productivity is lower than was originally expected.
Effort actually expended on a software component can be compared to the size (which could be measured in lines of code or FPs). The performance of established staff can be compared to previous records of their work. New and possibly inexperienced staff can be identified.

Up to 3 marks for each part (9 marks in total)

b)   Write a memo to the project board explaining FOUR options for dealing with the delay to the project.

(8 marks)

Among the possible options that might have been explained are:
- Accepting the delay and redrafting the plan with a new completion date
- Re-planning to allocate staff whose tasks are ahead of schedule to tasks that are behind schedule
- Bringing in additional resources – this will increase costs
- Reducing project scope i.e. obtain agreement to deliver less
- Reducing quality and increase risk – by reducing testing for example
- Using off-the-shelf components rather building them
- Using an incremental delivery approach to stagger deliverables, some might come earlier than originally planned but others would be later
- Outsourcing development work

Two marks awarded for each option depending on the amount of explanation.

c)   One possible result of a delay is an exception report. What are the contents of an exception report?

(8 marks)

Two marks for each valid point, examples of which are,
- Explanation of the cause of the exception
- Recommendations
- Revised plans and budgets
- Possible alternatives and options

Examiners' Guidance Notes

General
This question was designed in three parts to examine a candidate's knowledge of project controls and reporting.

a)   This was the hardest part of this question and was designed to allow exceptional candidates the opportunity to demonstrate and apply their knowledge of project controls. It was rarely answered well and most answers

focused on re-planning or change control. It was not focused on action-taking or decision-making but too many answers listed actions to be taken to resolve the situation when what was asked for was ways of finding out about the causes of a situation as a prelude to taking action. In some cases parts of the correct answer were written down but if a candidate failed to offer up their answer in three parts it was not possible to award marks because it wasn't clear which particular cause was under discussion.

b) Though there were no marks for the actual memo format in this particular case it was assumed that the use of a memo would force the candidate to present their information in a structured and focused way. Lists of bullet points scored some marks but only answers that sought to 'explain' scored full marks. Candidates tended to answer in one of three ways. Some candidates simply represented the information in the scenario, others offered up solutions that would prevent further delays but candidates that offered up options that would allow the project to get back on track scored the highest marks. It was anticipated that the majority of candidates would score well in this question.

c) Many candidates failed to recognise that an exception report is triggered by the forecast breach of reporting tolerances. Many answers offered up descriptions of highlight or periodic reports. Candidates who successfully identified that an exception was an unusual forecast situation that triggered certain responses fell into two categories; those that included generic information in the report such as author, date, version and those that focused on contents that would be unique to an exception report. The latter category scored highest.

B5. You have been asked to assemble a project team for a development project. You will require analysts, programmers and testers. There is an IT Department at the company doing maintenance and support. You have been told that you will be able to get about half the team you require from here and the other half will be hired from outside.

a) Describe the five key steps in a recruitment process

(10 marks)

b) In deciding who should do which job which task in the plan list 5 factors you would take into account.

(5 marks)

c) The team members from the IT Department have been working on their tasks for a month when the newly hired external analysts and programmers join. Instead of an increase in productivity there is a decrease in productivity. What could explain this?

(10 marks)

Answer Pointers

a) Describe the five key steps in a recruitment process

(10 marks)

As a guide 2 marks for each part of the process identified.

- Step 1 - Recruitment - finalising job descriptions, identifying a post/role, contacting agencies or advertisers to create a short-list
- Step 2 - Selection - choosing the method, eg panel, interview, psychometric tests, observed tasks, choosing who will be involved, background/qualification and CV checks
- Step 3 - Contracting - contacting successful, and providing feedback to unsuccessful, candidates, agreeing conditions of employment, agreeing remuneration
- Step 4 - Induction - preparing new staff for work by briefing them on the company, conducting health and safety training, providing training or equipment necessary toperform their role,
- Step 5 - Reviewing - criteria for evaluating, time before review conducted, establishing if the appointment (and the process of appointing) was successful?

b)   In deciding who should do which job which task in the plan list 5 factors you would take into account.

One mark each for any of the following
1. Skill - can they do it
2. Experience - can they do it quickly/well
3. Is the task on the critical path
4. Is there a development need for an inexperienced developer
5. Will they enjoy it / find it interesting
6. Availability
7. Cost

(5 marks)

c)   The team members from the IT Department have been working on their tasks for a month when the newly hired external analysts and programmers join. Instead of an increase in productivity there is a decrease in productivity. What could explain this?

(10 marks)

It might be explained by applying the Tuckman-Jensen model of the stages of work group formation (forming, storming, norming, and performing.

Other factors such as the old team being involved in training the new staff, new staff being on a learning curve where productivity is lower as they learn about the new environment or application, or possible demotivation or anxiety in existing staff all attracted marks.

Examiners' Guidance Notes

General
This three part question tested candidate's knowledge and ability to apply it in managing people and teams.

a)   This question was designed to be answered well by the majority of candidates and generally those that attempted it scored well. Those that attempted it and didn't score well had focused too much on the interview and testing aspects at the expense of those important aspects at the start and finish of the process.

b) This part of the question was designed to allow the majority of candidates attempting it to score well. It asked for a simple list of five factors and in the main the majority of those attempting it were able to answer it.

c) This question required candidates to draw on theoretical knowledge and apply it to a specific context. Many candidates responded by focusing on why the productivity of the new staff was low but the question was clearly focused on why a team that is performing well now had a dip in productivity. Candidates could score marks mentioning common sense causes such as the old team may be involved in training the new staff or it could be that the old team was working exceptionally hard knowing that extra resource would soon be arriving to pick up the burden but the fullest marks went to candidates who applied the motivational and team building models to the scenario. On the whole this question was not answered well and the majority of candidates scored poorly.