

**BCS THE CHARTERED INSTITUTE FOR IT**  
**BCS HIGHER EDUCATION QUALIFICATIONS**

**BCS Level 5 Diploma in IT**

**APRIL 2013**

**IT PROJECT MANAGEMENT**

**EXAMINERS' REPORT**

**Section A**

- A1**    a)    Name FOUR criteria by which a project can be judged a success.  
**(4 marks)**
- b)    Your company has decided to develop a new in-house computer system and the project plan has been prepared. Explain briefly the FOUR key steps (which might then be repeated) in the project control life cycle.  
**(5 marks)**
- c)    A project board has been set up and will meet monthly. You are the project manager and must prepare a report for each meeting. Describe EIGHT different types of information that you might expect to include in each such monthly report  
**(16 marks)**

**Answer Pointers**

- a)    The full **4 marks** were awarded naming, clearly and fully:
- Completed to schedule
  - Completed within budget
  - Meeting all requirements (or perhaps fulfilling the business case)
  - Providing proven or adequate quality
- b)    The expected four key steps of the project **CONTROL** life cycle are:
- Monitor progress (time, cost and deliverables) against the plan
  - Compare actual progress with planned progress
  - Identify variations from the plan
  - Take any appropriate corrective action at this stage.

**3 marks** awarded for naming, correctly, these 4 phases with a **further 2** marks for the quality of explanation, emphasising the need to identify variations from the plan quickly and to then take sensible, and speedy, corrective action.

- c)    **1 mark each** for identifying, clearly, **eight distinct different** information types – to include the first two in the list below. Then **a further 1 mark each** for a good clear explanation of each type. The question expected most of the distinct information types to be similar to those in the following list:
- Progress to date against plan
  - Expenditure to date against budget

- Use of resources to date
- Milestones achieved
- Deliverables produced
- Reasons for any variations from plan/budget to date
- Recommended corrective action
- New issues/problems
- Unresolved issues/problems from previous months' reports
- Review of risks, and changes to risk assessments
- Requests for change
- Quality issues
- Staffing issues
- Any anticipated issues/problems
- Anticipated progress and deliverables for the forthcoming reporting period
- Actions/decisions (especially by Board members) required now and/or during forthcoming period.

Variations of a single information type (such as progress against the project plan, which could be broken down further into "tasks started but not finished on time", "tasks not started on time", etc) were treated as a single information type in this context.

## Examiners Guidance Notes

### General

This question covered three different areas of project management and was almost as popular as A3.

Most candidates were well aware of the concept of success criteria in part a, but in part b many tended to confuse the project CONTROL life cycle (as named in the question) with the project development life cycle – which is not the same thing. Part c was based on regular monthly reporting **by the** project manager **to the** project board, but again many candidates based their answers on other types of report, such as the project initiation report or the original business case.

- The question expected a fuller definition of the four criteria than just four words (e.g. Cost, Time Scope and Quality). In this context "scope" or "satisfying the customer" is not quite the same as "meeting all the project requirements fully".
- As noted above, the word "control" was highly significant in this question but, disappointingly, most candidates overlooked it and concentrated instead on the project development life cycle or the various project stages, neither of which were awarded any marks. In the answers that did refer correctly to "project control" candidates often then failed to identify the three key factors (time, cost and deliverables) that needed to be included.
- Candidates needed here to consider both the purpose of the report (monthly progress) and the recipients (the project board) when selecting the information types that it would be sensible to include– with a good description of each type, concentrating on and explaining how these would inform the board members of each aspect of project progress. There was a tendency to include highly technical decisions, such as the programming language to be used, or low level detail (such as timesheets) rather than the broader aspects of progress and any problems that the manager felt it sensible to bring to the board's attention.

Some answers listed 10 or more "information types" whereas the question specified only eight.

**A2 a)** Explain what in project management is meant by 'quality'? Identify **THREE** differences between quality assurance and quality control

**(12 marks)**

b) Describe **TWO** techniques for carrying out quality control on a software system during **EACH** of the following stages of a project

- i) design
- ii) build
- iii) system integration
- iv) system acceptance

Bear in mind that it is possible that some specific techniques can be carried out during more than one of these stages

**(8 marks)**

c) In addition to software what else can be tested on an IT project?

**(5 marks)**

### Answer Pointers

a) A standard definition is:

"CONFORMANCE to stated **CRITERIA** agreed by the **CUSTOMER** or its representatives" **3 marks** were awarded for answers where all **three** of these key points were identified clearly.

Briefly, the differences between quality control and quality assurance are:

- Quality Control is done within the project / QA is external to it
- Quality Control checks products/deliverables /QA checks processes
- QC checks are done against unique criteria / QA is done against good practice

**3 marks** were awarded here for **each** of the **three** required clear, well-explained, varied valid differences, e.g. as below.

**(3 x 3 = total of 9 marks)**

In more detail:

Quality Assurance	Quality Control
External to the project, maybe even external to the organisation eg ISO	Internal to the project
Focus is on ensuring the quality checks are taking place.	Focus is on testing/inspecting documents or technical components
Audits of processes against agreed procedures/manuals for the whole project	Checks are done against specific criteria/standards for that component
Quality Assurance reviews/audits must be scheduled into the plan to make sure they happen but external resources may not appear in the plan. More likely to be milestones than activities.	Effort allowances must built into the plan to allow team members time to plan and carry out the checks. Must be shown as activities with duration and assigned resources.

- There are a number of techniques for carrying out quality control on a software system during the various stages, including:
- Desk checking
- Document review
- Peer review
- Inspection
- Walkthrough
- Pair programming
- Static testing
- Unit testing
- Fagan Inspections
- Integration testing
- System testing
- Black Box testing
- White box testing
- User acceptance testing
- Regression Testing
- Performance Testing
- Reliability Testing

1 mark each was awarded for identifying and describing (clearly) **two** of these (or similar) techniques appropriate to each of the four named stages of development

**(2 x 4 = total of 8 marks)**

c) Other aspects of the project that can be tested could include:

- Hardware, and network
- Documentation
- Users (who have undergone training)
- Facilities - for environmental factors such as heat generated or electricity consumed
- Procedures - for accessing support or logging faults

1 mark was awarded here for **each** clearly identified, different item.

**(Up to 5 marks)**

## Examiners Guidance Notes

### General

This was by far the least popular question in Section A of the paper, and the least well answered. In part a many candidates had difficulty in explaining clearly the key differences between quality control and quality assurance and it appeared frequently that these two concepts were not well understood. In many part b answers there was a tendency to concentrate on describing the four stages themselves, rather than considering the type of testing that might be appropriate within each of these stages. Also many candidates lost marks by only listing their selected techniques for each stage, with no description or justification at all.

- a) Many of the initial explanations of “quality” here were rather vague and loose, lacking the precision of a clear definition. Some repeated the success criteria (from the previous question) rather than concentrating on quality itself. In the second part there was often a tendency to use words or concepts such as “pro-active” and “reactive” (or “after” and “during”, or “within the budget” and “outside the budget”) to describe the differences, but without then explaining their meaning in this context. Answers needed to concentrate more on “who”, “what”, “how” and “when”. This all implied a lack of underlying understanding.
- b) This part of the question related mainly to the achievement of quality through testing but many of the answers (where present) tended to concentrate on describing the project stages themselves rather than consider what types of testing might be most appropriate within **each of** the named stages. Thus the design stage might be “peer reviewed” and the build stage could be “unit tested”. Several answers listed techniques such “Pareto analysis” or “statistical sampling” without explaining what these were or how they might be used (if at all).
- c) This followed on from part b by concentrating on testing the non-software aspects of an IT project, but there were few good, appropriate answers. Some incorrectly focussed, for instance, on other (non-testing) topics, such as post-project reviews.

- A3** A small IT department has been asked to set up an online enquiry database system. The IT manager (who will act as project manager) has drawn up an initial plan of the work involved:

	Activity	Weeks
A	elicit requirements from the intended users, and draw up a specification	3
B	design the underlying database	2
C	build and test the input and data validation software	7
D	build and test the enquiry software	5
E	build and test the reports software	4
F	integration testing	2
G	write the user manuals	3
H	system testing by the end users	2

Task B must follow A

Tasks C, D and E can run concurrently, but must follow B

Tasks F and G can run concurrently, but cannot start until all three tasks C, D and E have been completed

Task H must follow tasks F and G

- a) Draw an Activity on Node network diagram for this project, showing the earliest and latest start and end dates, and the float, for each node. Use week numbers as the

time units. Highlight the critical path on the diagram and state the minimum duration for the project.

**(11 marks)**

- b) The IT manager has one analyst (named M) and two programmers (named X and Y) available for the project. The analyst is also an experienced database designer, and will write the user manuals. One of the programmers (programmer X) has good experience of developing data input programs.

On the network diagram identify the types of staff, including end users, needed for each of the tasks. Note that the individuals should not be identified.

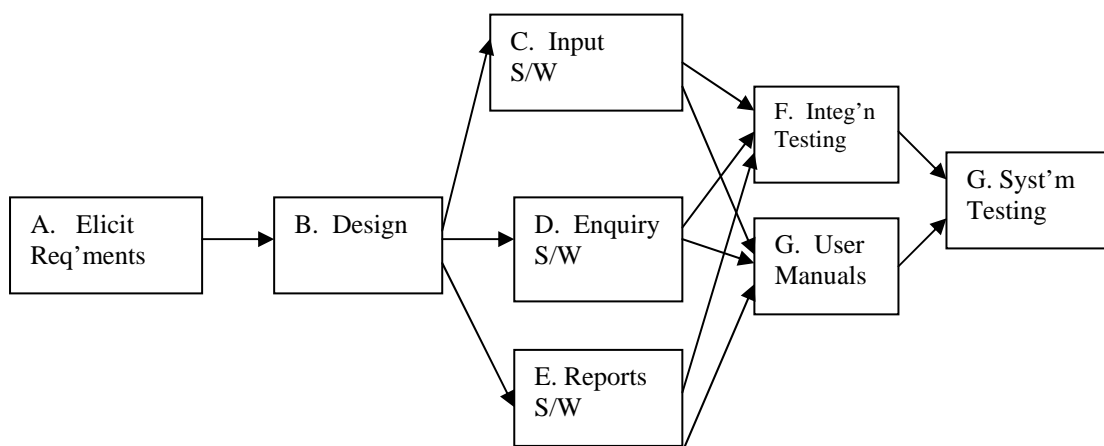
**(4 marks)**

- c) Bearing in mind the types of staff identified as appropriate for each task in (b) above, re-draw the project plan as a Gantt chart. On this diagram name the individuals required for each of the tasks and state the new minimum duration.

**(10 marks)**

### Answer Pointers

- a) The Activity on Node diagram should be similar to:



with fully structured nodes displaying the following values:

Task	Duration	EST	LST	EFT	LFT	Float
A	3	0	0	3	3	0
B	2	3	3	5	5	0
C	7	5	5	12	12	0
D	5	5	7	10	12	2
E	4	5	8	9	12	3
F	2	12	13	14	15	1
G	3	12	12	15	15	0
H	2	15	15	17	17	0

and preferably using a recognised standard activity box layout (with a key)

A total of **11 Marks** were be awarded for:

- Diagram (no marks for an activity–on–arrow diagram) – **without** “start” and “end” nodes
- Values (as above)
- Highlighting on the diagram (and naming) the CP (ABCGH)
- Correct minimum duration, clearly stated (17 weeks)

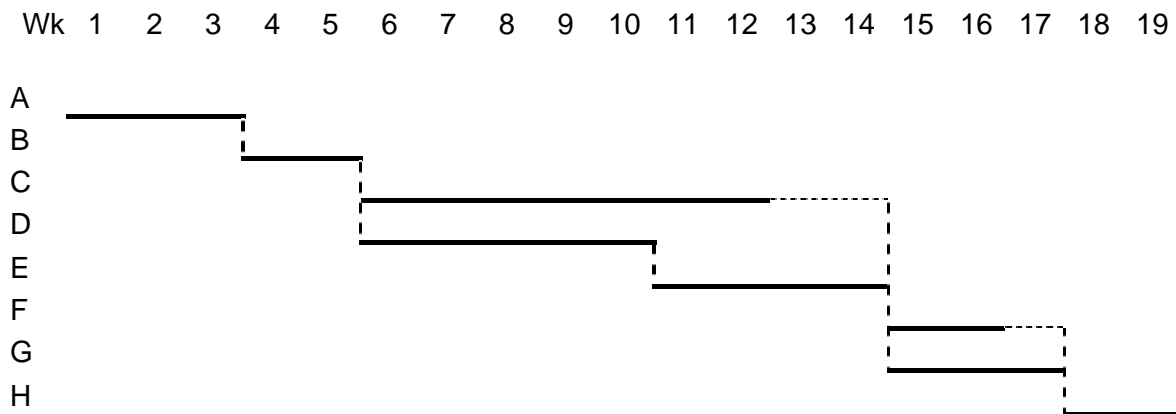
- Use of a recognised standard node notation, with key, and dependency arrowheads

**b)** 2 marks for a good allocation of staff types to tasks, such as:

A: AN, US  
 B: AN  
 C: PROG  
 D: PROG  
 E: PROG  
 F: (AN), PROG(S)  
 G: AN  
 H: AN, (PROG), US

Then another **2 marks** for showing these on the network diagram in some way.

**c)** This expected a Gantt chart similar to:



with resource allocations marked clearly on the diagram. These were most likely to be:

**A:** M, U; **B:** M; **C:** X; **D & E:** Y; **F:** X, Y; **G:** M; **H:** M, U

Up to **10 Marks** awarded for:

- correct layout,
- structure,
- scale,
- task durations,
- dependencies,
- floats,
- the naming of resource allocations, and
- stating the new minimum duration (which would be 19 weeks with these suggested staffing allocations, or 21 weeks if the analyst is assigned also to task F)

## Examiners Guidance Notes

### General

As ever, this network diagram question was very popular and usually well answered. However there were several instances where candidates failed to read each part of the question fully and thus omitted a key point or did not provide a complete answer to the question as stated, particularly in part b. Part c was essentially a resource allocation issue, with a likely clear resource clash, which many candidates overlooked.

- a) Very few problems here with the underlying network structure. It is helpful if candidates use a full page for their diagram with one of the standard (text book or BS standard) activity node layouts – and a key. Several used a node layout that omitted the float. Dependencies were also omitted quite often (or, very occasionally, shown in the wrong direction).
- b) Three key parts of the wording of this (straightforward) question were: “On the network diagram”, “including end users” and “individuals should not be identified”. Very few candidates gained full marks, mostly by failing to follow one or more of these instructions. Most often the individuals, rather than the staff types, were identified when allocating staff types to tasks. “End Users” (or just “Users”) were often ignored – especially for task A.

The question did not expect the IT Manager to be a resource to be allocated to any of the named tasks, nor for other staff types (such as “tester”) to be introduced.

- c) Many candidates did not allow for resource clashes here, especially between tasks D and E for programmer Y. Others split parts of the 3 “build and test” programming tasks (C, D & E) between the programmers (rather than allocating one programmer to each task) – which is not what was intended and usually is not acceptable for programming tasks

Gantt charts are used widely in project management and the overall quality of the diagrams produced for this answer 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. Note also that, with resource allocation, there can be two different types of task dependency – those between the tasks themselves (as stated in the original question) and those dictated by the resource allocation.



## Section B

**B4** A large steel company has decided to move the corporate legacy systems onto a cloud computing solution. The work is complex and involves various parts of the company across its four main sites. The work will involve colleagues from Sales, Finance, and Operations as well as specialist IT suppliers. The IT department has expressed concerns about moving established systems beyond the company's control. The move is part of a wider change to reduce staff numbers.

a) Draw an organisation chart that will be appropriate for managing this work

**(10 marks)**

b) Describe the purpose and contents of TWO reports that the project manager will need to obtain from their project team.

**(10 marks)**

c) Explain the nature and purpose of an exception report.

**(5 marks)**

### Answer Pointers

a) The chart should have shown the following five main actors

- Project Manager
- Project owner
- Project owner may be a composite board made up of representatives
- Suppliers
- Team members

**1 mark each, 1 mark** for correct links to other actors on the chart eg PM should only be linked to project owner/board not to suppliers or other parts of the business. Project Team members should only be linked to PM

Marks were also be awarded for audit/assurance/support/configuration roles

b) Reports – these could have included:

- Time sheets – which record the amount of hours an individual team member has spent on each project (and non-project) activity in, say, the last week. They can identify when a team member has been involved in non project work and can also be used to calculate staff costs
- Deliverable quality checks - this can indicate where an activity has not been completed because of the need for rework
- Routine reports e.g. number of issues raised during the week

**5 marks** were allocated for each of two possible reports

c) An exception report will contain

- Explanation of the cause of the exception
- Recommendations
- Revised plans and budgets
- Possible alternatives and options

The creation of an Exception Report is triggered by a breach of reporting tolerance and its purpose is to give decision-makers early notice of a potential problem.

### Examiners' Guidance Notes

- a) This was a relatively simple question asking for an organisation chart. It was very poorly answered in the main with little attention given to the specific change being implemented or the nature of the project. Many candidates created company charts which dealt with routine operations rather than the change project. The result was that many of the answers marked had organisation charts that failed to mention the IT Project Manager.
- b) This question asked for reports that came to an ITPM rather than reports created by the ITPM for others. Many answers focused on reports created by the ITPM or generic reports that might be created by others outside the project.
- c) Exception reporting can only take place when a plan for the future has been made. Answers that scored well described exception reports starts using plans to look at the future and whether targets (within certain tolerances) will be met. If the estimates for the future are always in accord with the plan there will be no exception report. Weak answers confused tolerances with contingencies.

- B5** a) Describe FIVE techniques a project manager could use to identify risks  
(10 marks)
- b) Explain what the difference is between project risks and business risks  
(4 marks)
- c) Describe FIVE common responses to a project risk.  
(11 marks)

### Answer Pointers

- a) Techniques for identifying risk might include
  - Examining previous project's risk logs
  - Employing an expert consultant
  - Group Workshops
  - Examining Lessons Learned reports from previous projects
  - Brainstorming
  - Use of risk analysis software packages
  - Focused interviews
  - SWOT analysis

It is important to remember that risks can emerge during the project and not just at the start so marks were awarded for recognising this.

- b) Project risk is internal to the project, relating to activities and people within the project. Business risk is external to the project, relating to the activities of the business, the general economic and legal climate, etc. but it may have an effect the project.

Project risk management is the responsibility of the PM while business risk management is the responsibility of the project owner.

Project risk activities are likely to come from the project budget but business risks will be outside the project budget.

- c) Risk Management Methods include
  - Acceptance
  - Prevention (Avoidance)

- Reduction (bonus for distinguishing here between probability and impact)
- Transference
- Contingency plan (with emphasis on the “plan”)

### **Examiners' Guidance Notes**

- This was well answered in the main but some candidates lost marks for making a list rather than providing a description as the question asked. A list of single words doesn't allow for any meaning to be conveyed. Some one word answers suggested a possible technique but with no amplification it was impossible to award marks. Some candidates introduced techniques from 'estimating' and where their use had been explained in the context of identifying risks marks were awarded.
- There are about four key differences between the two but candidates were expected to be able to identify two. This was problematic for some students who didn't actually point out differences.
- This question was not answered well and this could be due to a misunderstanding of what was expected. The use of the word 'common' may have caused some students to think of actual activities, such as hiring extra staff, rather than categories of response such as reducing impact or providing contingencies.

- B6** a) Explain the advantages and disadvantages of buying an off the shelf (OTS) package as opposed to writing new software.

**(10 marks)**

- Describe THREE different approaches to estimating effort for an IT system development project. For each one, explain whether it would be suitable for OTS package implementations or new software projects or both.

**(15 marks)**

### **Answer Pointers**

- a)** Advantages / Disadvantages might have included:

- Time - installing a package is quicker than creating it from scratch
- Cost - in most cases a package will be cheaper than OTS
- Uniqueness of requirements - is it something that there are many packages for
- Importance of the function to business, for example:
  - There may be less ability to own the intellectual property rights and protect the package from external factors such as the supplier ceasing to trade
  - If the functionality to be included in the software provides a competitive edge that you don't want to share then an OTS is less attractive: if it is a routine process OTS is more attractive
- Support and Maintenance – this would be provided by the package vendor
- Testing and user involvement is different with OTS and new software development
- Resources are needed to design and build your own solution in-house, and OTS will be more attractive when these are not available (although new software could be written for you by an external software development company).

**b) Estimating techniques****(15 marks)**

The question asked for a description of different approaches so the table below would not have been acceptable as an answer. It is provided as a guideline and students who describe how a technique might be used, and this is at odds with the table below, can still be awarded high marks.

Technique	SW Dev	OTS	Both
Top Down			X
Bottom Up			
CoCoMo	X		
Function Points	X		
Delphi			X
Analogy			X
Expert Opinion			X
Standard Product		X	

**Examiners' Guidance Notes**

- a) This was part of the question was answered very well by the majority of students with many scoring maximum marks. Where marks were lost it was normally for failing to communicate an answer well. Some candidates described the advantages and disadvantages of buying an off the shelf package at the beginning of their answer and then laid out the advantages and disadvantages of writing new software. Unsurprisingly one was the opposite of the other but in many cases this did not cause the student to lose any marks. Most marks were lost by students who mixed up the two so it was impossible to see which one of the two scenarios (OTS or bespoke) they were talking about.
- b) This question was answered very badly with few students scoring any marks at all. This was a question about estimating techniques and how they could be applied to different forms of new system creation. Many failed to attempt this question and those that did focused on implementation issues around OTS. Where more than three techniques were given, the first three were marked and subsequent ones ignored. Some students used Price to Win as an estimating technique but this was not a valid answer. Price to Win is a commercial decision but an estimating technique is a methodical estimate of the effort/time/cost of completing a IT project.