

THE BCS PROFESSIONAL EXAMINATIONS
BCS level 5 Diploma in IT
September 2014
IT PROJECT MANAGEMENT
EXAMINERS' REPORT

Section A

Question A1

- a) Define the word “stakeholder” in relation to an IT development project.
(3 Marks)
- b) You work for a small research organisation with a number of branches throughout the country. At the moment each of these branches uses a different main database system. It has been decided by Head Office that the database system used by your branch should be expanded and then used by all of the other branches to replace their existing database systems. They would need to transfer all their data to this expanded database on a main server, which would be located in your organisation's offices. A network would be set up linking all the branches to this main server.
- List and explain at least FOUR different types of stakeholder in this new project. Identify their main concerns and their stake in the project.
(12 Marks)
- c) A project sponsor has also been appointed. Name at least THREE people, or groups of people, who would then be directly responsible to the sponsor
(6 Marks)
- d) You have been appointed as the project manager and need to set up a project team. Using the Tuckman model, list and explain very briefly the four main phases that the team might go through before becoming fully effective.
(4 Marks)

A1 Answer Pointers

- a) A Stakeholder can be defined as anyone with a valid interest in, or affected by, an IT project (2 marks) or the products delivered by it (1 mark). Total = 3 marks
- b) The stakeholders in this scenario (with their likely concerns and stake in this project) could include:
- all **project personnel**, including the project team and especially the **project manager**, whose reputation might be at stake if the project fails, or would be enhanced by project success;
 - other **staff in your office**, whose responsibilities and workload are likely to increase;
 - **senior management at your office**, who will be responsible to the national federation for the success of the project;
 - the **IT staff in other offices**, who will need to understand the replacement system – and whose jobs may be at risk;
 - **other staff in other offices**, who will be required to learn and use the replacement system;
 - all **suppliers** involved in the extension of the existing system, who would be keen to supply additional hardware, software, networking equipment, etc – and thus increase their sales
 - **Users of the research data** provided by the existing systems, who would not want any loss or delay (or lack of reliability) in the data to be provided by the new centralised system for their own work.
 - **Senior management at Head Office** (who would probably be the project sponsor). Their concerns and stake would be similar to, but greater than, those of the project personnel as the future viability of the research federation is very dependent on the

success of this project. Any delays or shortcomings in the new central system could affect adversely both current and future research work.

Note that each of these groups have clearly different concerns and stakes (as indicated above).

Up to 3 marks were awarded for each of 4 **different** types of stakeholder identified, provided that likely (and sensible) concerns and stake(s) were clearly identified and discussed for each type listed. Total $4 \times 3 = 12$ marks

- c) Any of the following could be named as being responsible to the project sponsor:

- Project board
- Project manager
- Project support office
- Configuration management office
- QA section (possibly)

2 marks awarded for **each** person or group named, up to the maximum of **6 marks**

- d) The four phases of the Tuckman model are: forming, storming, norming, performing – which must be **in this order**.

2 marks awarded for the correctly ordered list, plus 2 for the explanations. Total **4 marks**

A1 Examiners' Guidance Notes

Overall, the concept of a stakeholder was not very well understood though most candidates answering this question were able to demonstrate an awareness of the Tuckman model (in part d).

- a) Often, candidates concentrated on only the financial aspects, considering there to be only one stakeholder (the “owner” or “financial backer” of the project) or a group of stakeholders (such as “shareholders”). This then impinged on their identification of the full range of different types of potential stakeholder (for instance: those “directly involved”, “indirectly involved” and/or “affected by”).
- b) Few candidates answered this part very well. Many answers tended to concentrate on a “standard” (IT) project rather than that described in the scenario. “Concerns” were sometimes identified well but there was then very little distinction between these concerns and stakes. There was also a tendency to concentrate on “involvement” and “responsibilities” rather than “concerns” (and then “stake”). This then showed a very limited understanding of the concept of “stake”. i.e. what has the individual, or group of individuals, to gain or lose from the success or failure of the project. This “stake” could be reputation, money, jobs, responsibility or (perhaps) a change from interesting, exciting work to dull, boring work. Sometimes an analogy with stakes and betting helps here.

Note that only FOUR types of stakeholder were requested; many answers included more than this.

- c) This part required a basic knowledge of project organisation. Too often a list was produced that contained others involved in the project, such as team leaders, who would rarely be responsible directly to the sponsor. The “sponsor” as sometimes referred to as the “financial backer”, which is often not the case.
- d) Most answers demonstrated a sound knowledge of the four main phases of the Tuckman model, some added the fifth “adjourning”. However the explanation of each phase (and sometimes their order) was not always clear.

Question A2

A small trading company has decided to commission a small local software house to develop a new order processing system. This will replace the existing system which is run by an external service provided. The system will be used by three main sections of the company:

- Order processing (OP)
- Invoicing (IP)

Receipts processing (RP)

each of whom have their own specific requirements and will require online access to the new system.

The outline plan includes the following main activities:

- **A, B, C.** Gather requirements for each of the three company sections - this can be done in parallel for each section, and will take 3 weeks for the OP section, 4 weeks for the IP section and 5 weeks for RP section.
- **D.** Consolidate requirements – this is dependent on the completion of the activities A, B and C above and will take 2 weeks
- **E.** Design software – dependant on requirements consolidation (activity D), to take 4 weeks
- **F.** Build and test software – dependent on software design (E), to take 8 weeks
- **G.** Order and delivery of communications equipment and hardware - which is also dependent on requirements consolidation (D) but can run in parallel with the software design (E), to take 9 weeks
- **H.** Install communications equipment and hardware – dependent on order and delivery (G), to take 2 weeks
- **I.** Design acceptance testing cases – also dependent on requirements consolidation (D), to take 6 weeks
- **J.** Integration testing – dependent on both build and test software (F), and the installation of communications equipment and hardware (H), to take 3 weeks
- **K.** Acceptance testing – dependent on acceptance test design (I) and integration testing (J), to take 3 weeks.

- a) Calculate the earliest and latest start and finish times and the floats for each of the above activities and present them in a table. Identify the critical path and state the minimum duration for the project.

(10 marks)

- b) Just before the project starts it is realised that, due to the absence of key staff, the requirement gathering for the IP section (activity B) will now take 5 weeks. Also, that the communication and hardware installation (H) will now take 5 weeks. Re-calculate and re-present the table that you produced for part a, and identify any other changes that might result from these changes.

(8 marks)

- c) You could use either an Activity on Node network diagram or a Gantt chart to display this information. Discuss three advantages of each approach.

(7 marks)

A2 Answer Pointers

- a) The question expected a table similar to:

Activity	EST	LST	EFT	LFT	Duration	Float
A (OP)	0	2	3	5	3	2
B (IP)	0	1	4	5	4	1
C (RP)	0	0	5	5	5	0
D	5	5	7	7	2	0
E	7	7	11	11	4	0
F	11	11	19	19	8	0
G	7	8	16	17	9	1
H	16	17	18	19	2	1
I	7	16	13	22	6	9
J	19	19	22	22	3	0
K	22	22	25	25	3	0

From this:

6 marks awarded for correct EST, LST, EST, LFT values in the table

2 marks for correct floats in table

1 mark for naming the critical path

CDEFJK

1 mark for the correct minimum duration

25 weeks

= 10 marks

b) This expected a similar table:

Activity	EST	LST	EFT	LFT	Duration	Float
A (OP)	0	2	3	5	3	2
B (IP)	0	0	5	5	5	0
C (RP)	0	0	5	5	5	0
D	5	5	7	7	2	0
E	7	9	11	13	4	2
F	11	13	19	21	8	2
G	7	7	16	16	9	0
H	16	16	21	21	5	0
I	7	18	13	24	6	11
J	21	21	24	24	3	0
K	24	24	27	27	3	0

From this:

6 marks awarded for a fully corrected table (including float)

2 marks for other changes: **two** new critical paths: BDGHJK and CDGHJK

minimum duration 27 weeks

= 8 marks

c) Up to 3 marks for each of the 3 advantages discussed for each of A-on-A and Gantt, plus 1 for quality of discussion.

Typical advantages of an A-on-N diagram are:

- easier to calculate AND display any amended values,
- better for displaying dependencies,
- float is more clearly defined and displayed for each task,
- the critical path is easier to highlight and see,

whereas a Gantt chart:

- is more visual, especially for non-technical staff
- shows concurrent tasks more effectively
- is a better basis for staff allocation
- can be used to highlight progress on every activity
- shows the time scale.

Examiners' Guidance Notes

Unusually this "Critical Path" based question was not the most popular in this section of the exam paper.

The earliest and latest event dates were usually answered correctly in parts a) and b) by those who attempted this question, but there were often wide variations in the understanding and calculation of float – and the essential relationship between zero float and the critical path. Disappointingly, some part b) answers showed negative values for float and many identified critical paths where not all the float values were 0.

Some candidates produced a table with the correct headings, but then listed the wrong values under these headings – implying a lack of understanding of the four standard abbreviations EST, LST, EFT, LFT.

Many candidates supplied an A-on-N or A-on-A diagram, and not the table that was specified in the question. Half marks were awarded here, provided that **all** the requested values were shown correctly.

Some candidates tried to introduce an extra dependency (between E and G) to force activity G to run in parallel with activity E, not realising that this is inherent in both activities being directly dependent on activity D. This extra (incorrect) dependency then affected the remainder of the calculations and the critical path. Some allowance was made for this error when awarding marks.

In part c) consideration of the two alternative approaches was often very brief, with lists rather than discussion, though there were some well-argued discussions which identified clearly the advantages of each approach. Unfortunately there were several instances where the **same** advantage was listed against both approaches – typically “easier to show the critical path” and “easier to show dependencies” - implying perhaps a lack of underlying understanding of the two approaches; marks were deducted for this.

Note also that the question required only three advantages of each approach to be discussed, and did **not** ask for “disadvantages”.

Question A3

You have reached the stage in a project where you have created a plan that shows all the work that needs to be done. You must assign resources to the tasks.

- a) Describe FIVE factors that you would consider when allocating staff to a task.
(10 marks)
- b) You know that you have all the required skills in the project team but not enough people with these skills to meet the project deadline. What are some of the possible actions you could take?
(8 marks)
- c) It has been decided that you need to hire a new member of staff for the project. List the steps that you need to go through from identifying the need for a new resource right through to the end of the recruitment process.
(7 marks)

A3 Answer Pointers

- a) Sensible factors to be considered here could include:
- competence
 - experience
 - availability
 - criticality of task
 - possible resource overlap
 - staff development opportunity

2 marks were awarded for each well-described factor. Total: 5 x 2 = 10 marks

- b) Possible actions here could include:
- cross training existing members of the team
 - hiring new staff (or outsourcing key tasks)
 - asking for a delay in the project deadline
 - asking for a reduction in the project scope
 - breakdown of complex long tasks into smaller subtasks (**if** appropriate)
 - offering paid overtime for key staff with critical skills

2 marks for each sensible and well-explained action, up to a maximum of 8 marks.

- c) The standard steps are:
- create a job description
 - create selection criteria & decide who will apply it
 - advertise the vacancy
 - shortlist and inform candidates
 - interview and select candidate
 - inform successful and unsuccessful candidates
 - sign contract
 - induct new member of staff
 - review effectiveness of the new member of staff once he/she has started work

1 mark per sensible step listed, up to a maximum of 7 marks.

A3 Examiners' Guidance Notes

This was by far the most popular question in section A and, on the whole, well-answered.

However, in part (a) candidates often did not concentrate on the factors involved when you are allocating specific staff (with identified skills) to specific tasks and tended instead to concentrate on team formation and team building, and even recruitment, issues. There was a tendency also to consider time, budget and individual staff costs, rather than staff skills and the needs of each task.

Part (b) was usually answered sensibly though there was sometimes a tendency to assume that any member of the project team could undertake any task in the project, not allowing for the matching of staff skills to task requirements. If experienced staff are re-allocated to critical tasks then they must have the skills to undertake these task within the budgeted time. Also it is not always possible to split long or critical tasks into discreet subtasks – this was often assumed. Worryingly, some candidates strayed from consideration of (solely) IT projects by suggesting that some tasks could be automated in some way.

Part c required a straightforward list **right through** from “identifying the resource need” to “the end of the recruitment process”. Many candidates overlooked the initial, and/or the final, steps here. Others considered transferring staff from other projects within the organisation rather than the (solely) external recruitment of a new member of staff.

Question B4

- a) List some of the ways in which you can find out the users' requirements for a system
(5 marks)
- b) Identify FOUR situations when you should NOT involve users in the requirement gathering. Explain why you would not want to involve them.
(8 marks)
- c) Explain which project documents/products are used by each of the testing phases in a project shown below, the purpose of the testing phase and the role of the users in the phases.
- i. Unit Testing
 - ii. Acceptance Testing
 - iii. System Testing
- (9 marks)
- d) Name one of the ways that users are represented in the project.
(3 marks)

Section B

B4 Answer Pointers

- a) These could include: interviews, observation, prototypes, focus groups, JAD (Joint Application Development) workshops, process mapping.

5* 1 marks

- b) For example, when:

- users are management
- the project will reduce headcount (from the user base)
- there is a new system which will lead to a radical change in processes
- there are issues of confidentiality
- changes are driven by legislation
- there are no current users
- the project is an infrastructure project.

4*2 marks

- c) (i) Unit testing.

Products: unit test plan, test results, error logs, **Purpose:** to reveal errors **User role:** doesn't involve user, just developer or peer.

- (ii) Acceptance testing

Products: System requirements specification, user manuals. **Purpose:** to test functions, inputs and outputs of real data **User role:** reliant completely on users.

- (iii) System test

Products: System specification **Purpose:** tests interfaces, integration, regression, stress loading **User role:** done by professional testers or QA (Quality Assurance) / QC (Quality Control) function, may have some users but not necessary.

3*3 marks

- d) The expected answer was Project Board but user representatives may also be appointed to a Project or Quality assurance role and if the project is using Agile they may be involved in a systematic way (but this needed to be described in detail).

1*3 marks

B4 Examiner's Comments

This was the Section B question that was answered by the fewest number of candidates but was passed by the most. It was broken into four to parts each with a different degree of challenge.

- a) Many candidates scored the most of their marks with this question. A simple list with five correct techniques scored full marks. No marks were given for very generic ways of communicating with users such as telephone calls or meetings.

- b) Many students struggled with this and included answers such as 'when users might lie'. If a candidate didn't explain why these conditions existed, such as fear of job loss, their answer didn't score marks. There are a number of conditions when it is legitimate to decide not to involve users and these are listed in the marking guidelines above.
- c) On the whole this question was answered well and the majority of candidates realised the role of users in acceptance testing and the absence of users in unit testing. For maximum marks to be awarded the candidate had to tackle all three parts of the question.
- d) Very few candidates scored any marks here though it was a challenging question for the most able candidates.

Question B5

Cost benefit analysis of risk reduction

- a) What are the FIVE appropriate actions that can be taken in response to any project risk?
(10 marks)
- b) Which of these five appropriate actions is likely to be the most expensive? Explain and justify your choice.
(5 marks)
- c) The five appropriate actions are EITHER taken before the risk occurs OR deal with the consequences after it has happened. Explain when each type of action taken in response to a project risk takes place.
(10 marks)

B5 Answer pointers

- a) Appropriate types of action are:
 - Prevent the risk
 - Reduce the probability
 - Accept
 - Transfer
 - Implementation of a contingency plan to reduce impact of damage caused by risk occurrence

5*2 marks
- b) Prevention is likely to be the most expensive but a persuasive argument attracted marks for any of the others.
5*1 marks for each valid point
- c)
 - Prevent the risk - Before
 - Reduce the probability - Before
 - Accept - Neither but possibly leads to a Reactive response
 - Transfer – Before
 - Contingency – After, but this depends on a plan being in place beforehand. Some enabling actions may also be done beforehand, e.g. taking back-ups of data files, so that they can be restored in the event of data corruption

5*2 marks

B5 Examiner's Comments

This was the question in Section B that was answered least well. A number of candidates scored zero.

- a) One word answers scored a single mark and answers that were correctly amplified scored two marks. In some cases a student could score a single mark for a correct

single word but fail to score the second mark because any examples or explanations were incorrect. Additionally, some candidates didn't offer up general types of risk but instead focused on specific actions. In this case no marks could be awarded.

- b) Clearly, this would depend on the particular circumstances of the project. Marks depended on the quality of the arguments that candidates used to argue their case.
- c) This question asked the candidates to state whether something was 'before' or 'after'. Many candidates provided answers that omitted these two words. In this case no marks could be awarded. In the case of contingency, this might be set aside before the risk takes place but this is then used to deal with consequences of the risk after it has happened.

Question B6

Quality specification and management

- a) ISO9126 is an international standard specifically for software development and maintenance. It identifies six software quality characteristics. Name THREE software quality characteristics.

(6 marks)

- b) There are a number of the principles of a quality management system which are described in ISO 9001. Describe FOUR of these principles

(12 marks)

- c) You are working on a software development project which is creating software to control access to a building. The design is simple and unlikely to change, there is a fixed deadline and the budget is for the whole project will be fixed once the analysis phase is complete. Explain each type of quality control in the list below and say whether it is appropriate in this situation.

Walkthrough
Inspection
Quality Circle
Black box testing
Regression testing

(7 marks)

B6 Answer Pointers

- a) Any three from the six quality characteristics listed below

Functionality
Reliability
Usability
Efficiency
Maintainability
Portability

3 *2 marks

- b) The key ISO 9001 principles are:

1. Understanding customer's needs so requirements can be met
2. Providing leadership and direction
3. Involving all levels of staff
4. Focus on individual processes that create products and services
5. Continuous improvement of processes
6. Make decisions based on facts and evidence.
7. Building mutually beneficial relationships with suppliers

4 *3 = (12 marks)

- c) Explanation of techniques

5*1 marks = 5

It could be argued that inspection is the most appropriate approach as the design is unlikely to change a lot so effort should be put in up front in getting the documents and design and specification right. Although testing downstream is necessary, over reliance on this could throw up problems which should have been dealt with earlier and which could eat up time and budget.

Up to 2 marks

Examiner's Comments

Question B6

This was the Section B question answered by the least number of candidates. The majority of marks were scored by candidates who knew the quality standards well

- a) Many candidates scored full marks in this question.
- b) Very few candidates scored any marks in this section.
- c) This was part of the question that didn't require a detailed knowledge of particular quality standards but instead asked candidates to explain each quality control techniques listed and to evaluate the appropriateness of a variety of quality controls.