# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATIONS
## BCS Level 5 Diploma in IT

## IT PROJECT MANAGEMENT

12<sup>th</sup> October 2007, 2.30 p.m.-4.30 p.m.
Answer FOUR questions out of SIX. All questions carry equal marks
Time: TWO hours

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

> Only **non-programmable** calculators are allowed in this examination.

1. You are assigned the role of project manager for the design phase of a project which is to produce a specially written financial application for a large commercial organization. A preliminary requirements document has been produced.

    a) Outline the steps needed, given a requirements specification, to produce a satisfactory design for the application. **(10 marks)**

    b) Explain your role as the project manager for the design phase with particular reference to the types of communication that you would have with the design team. **(9 marks)**

    c) Identify the types of communication, both direct and indirect, that there would be between the client organization and the design team. **(6 marks)**

2. a) Explain what is meant by an algorithmic or parametric modelling approach to software effort estimation. **(4 marks)**

    b) Describe in outline TWO specific algorithmic models for estimating effort. **(12 marks)**

    c) Discuss the suitability of the two models for estimating project effort identified in (b) above for the scenario as described in Question 1. **(4 marks)**

    d) Evaluate the following statement. "In practice, the use of expert opinion to produce estimates of development effort is effectively the use of analogy." **(5 marks)**

**Turn over]**

3.  A small research organisation is planning to move to new premises outside the city. The outline plan for this move includes the following main tasks:

A       Inspect new premises, list all required communications facilities (3 weeks);

B       Order and deliver all communications facilities and devices (10 weeks);

C       Identify, order and deliver replacement PCs, printers, servers and other hardware (8 weeks);

D       Order and deliver all required office equipment (11 weeks);

E       Test new hardware with all communications equipment (1 week);

F       Test new hardware with all existing operating and applications software (2 weeks);

G       Test all applications software and databases on new hardware (2 weeks);

H       Move all staff  to new premises (1 week);

Tasks B, C and D can all run simultaneously, but are all dependent on task A.
Task E is dependent on tasks B and C
Task F is dependent only on task C
Task G is dependent on tasks E and F.
Task H cannot start until tasks D and G are completed.

a)      Draw a full Activity-on-Node diagram for this project, showing clearly the earliest and latest start and end dates, and the float, for each node.   No start or end nodes are required. Highlight and name the critical path, together with the minimum duration for the project.     **(9 marks)**

b)      The office equipment (task D) takes two weeks longer than planned to be delivered and installed.  Identify and explain briefly the resultant changes to the Activity-on-Node diagram and Critical Path.     **(3 marks)**

c)      Draw a Gantt chart for the revised project, incorporating the change to task D as in part (b). Show all task durations, dependencies, float and the critical path.     **(7 marks)**

d)      Identify and explain TWO advantages of using a Gantt chart in comparison with an Activity-on-Node network diagram, and TWO advantages of using a network diagram when compared with a Gantt chart.     **(6 marks)**


4.  You work in the IT department of a small manufacturing company and have been appointed to lead a team developing a new database system using a new development tool.  The business case for this software development project has been agreed by the company management.

a)      Name FOUR factors that the management might use to assess the eventual success of the project.     **(6 marks)**

b)      For each of these factors describe at least TWO potential problems that might arise to jeopardise the eventual success of the project.     **(8 marks)**

c)      Select FOUR of these potential problems and for each one describe what actions you might take either to:
            minimise the likelihood of such a problem occurring
            OR
            reduce the effect of the problem on the project should it occur.     **(11 marks)**

**5.**  Below is shown the activity network for a small project.
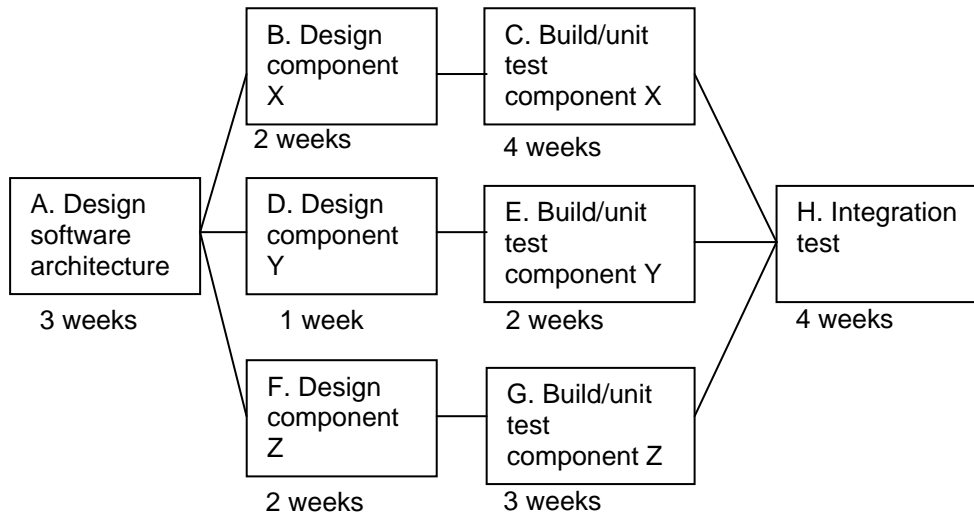


The software architecture design is always produced by a lead software architect. The designing, building, and unit testing of software components is only carried out by software developers. The integration test is only carried out by a system tester.

The weekly rates for the staff available are:

| Staff type | Weekly rate |
|---|---|
| Lead software architect | £1000 |
| Software developer 1 | £700 |
| Software developer 2 | £600 |
| System tester | £500 |

a)  Explain the process by which staff resources are allocated to the activities identified as needed for a project.  **(10 marks)**

b)  Illustrate the approach described in (a) above by applying it to the project above to produce a Gantt or other type of chart or table showing the staff allocated to each activity, and the planned timing of the activity. Note that only two software developers are available.  **(7 marks)**

c)  Calculate the staff cost of the project.  **(4 marks)**

d)  Discuss how you might replan the project if the lead software architect could also carry out the designing, building, and unit testing of software components.  **(4 marks)**

**6.**     a)     Explain how a project manager can use information that is generated by project control processes to identify situations where a project is late for each of the following reasons:

   (i)     staff originally allocated full-time to the project sometimes work on emergency maintenance of other applications;
   (ii)    the original estimates of development effort were over-optimistic;
   (iii)   the scope of the specification has been increased to add new functionality that was not originally planned;
   (iv)    productivity is lower than was originally expected.

   **(8 marks)**

   b)     Identity the options that are available for bringing a project back on schedule when it has been found to be late.     **(10 marks)**

   c)     Explain when and how exception reports would be created and how they would then be actioned.     **(7 marks)**