

INFORMATION MANAGEMENT AND CONTROL

Professional 1
December 1999

MARKING SCHEME

CIPFA

Question 1

This question seeks to test the knowledge of Module 1 of the Open Learning Material, with particular reference to Section 1.7.

Answers for the various sections should be along the following lines:

(a) The four key elements of an Information System are:

1. People 2
 - End Users.
 - IS specialists.

2. Hardware 2
 - Computers.
 - Network infrastructures.

3. Software 2
 - Operating systems, Bespoke systems and Computer packages.
 - Can also refer to instructions to Users.

4. Data 2
 - Can be text, alphanumeric, audio.
 - Can be stored in files, databases, expert systems.

In each case, score 1 mark for correctly naming the element, and 1 mark for an accurate brief description such as given above. (8)

(b) Business (Process) Re-Engineering (“BPR”)

1. BPR can be described as “the fundamental analysis and redesign of everything associated with a business area to improve performance by focusing on the key processes required to meet the business objectives”. 2

2. Reasons for undertaking BPR can include the (perceived) need for improvements to:
 - Service; 1
 - Speed; 1
 - Quality; 1
 - Efficiency; 1
 - Effectiveness. 1

and/or 1 mark for similar points to a maximum of 5.

3. Key steps will probably include:

- Identifying key business objectives. *1*
- Link processes to outputs. *1*
- Consider treating departments that are functionally and/or geographically separated as separate business units. *1*
- Link common data through common databases rather than having separate records for each department. *1*
- Moving down the decision process from the top to the point where the work is performed. *1*

and/or 1 mark for similar points to a maximum of 5.

(12)

(20)

Question 2

This question seeks to test the knowledge of Module 2 of the Open Learning Material, with particular reference to Section 2.2.

Answers for the various sections should be along the following lines:

(a) The five stages of the standard Systems Development Life Cycle are:

1. Feasibility Study, which: 2
 - examines the validity of the proposal,
 - considers technical, economic and logistic feasibility,
 - results in a recommendation about the way forward.

2. Systems Analysis, in two phases, to provide a specification of requirements. 2
 - gathering data; and
 - analysing data.

3. Systems Design, again in two phases: 2
 - general considerations of type of system (e.g. bespoke, package), type(s) of data capture and types of output; and
 - detailed design.

4. Systems Implementation, comprising: 2
 - training;
 - equipment conversion;
 - file conversion, and
 - system changeover.

5. Systems Maintenance: tasks include 2
 - evaluation
 - fine tuning
 - bugs
 - enhancements

In each case, score 1 mark for correctly naming the element, and 1 mark for an accurate brief description such as given above, making a section total of 10. (10)

(b) The four standard stages of prototyping are:

1. **Identify end-user requirements** 1½
 - prioritise according to business requirements.
 - assess the feasibility of possible solutions.

2. **Develop system prototypes** 1½
 - users and designers work together.
 - prototypes components tested as developed.

3. **Revise prototypes** 1½
 - users test whole prototypes.
 - elements refined until users satisfied.

4. **Incorporate final model** 1½
 - final prototype incorporated into new-system design.
 - developers start to write full system.

In each case, score 1 mark for correctly naming or describing the element, and ½ mark for an accurate brief description such as given above, making a subsection total of 6.

The **advantages** of prototyping include: 2

- gets user involvement.
- more quickly clarifies user requirements.
- can save a lot of time.
- relatively cheap.

while the **disadvantages** of prototyping include: 2

- can unduly raise expectations.
- users not always certain of their requirements.
- the complete specification can be dependent on the available technology.
- communications between users and analysts can be difficult.

(10)
(20)

Question 3

(a) The advantages of a network of PCs include:

- cheaper access to resources (e.g. printers).
- easier to share data and methodologies.
- software site licences can be cheaper, and reduce the potential for software fraud.
- need for change management procedures.
- potentially better security.
- can help foster a better community spirit.

Award 1 mark for each of the above and/or similar correct points, up to a maximum of 4
(4)

(b) The controls to be incorporated within the system-development team include:

- standardisation of methodologies and procedures.
- Management involvement.
- system-testing procedures.
- separation of module responsibilities.

Award 1 mark for each of the above and/or similar correct points, up to a maximum of 4.
(4)

(c) The controls to be incorporated within the final program include:

- Procedural Controls
 - * input controls 1
 - * processing controls 1
 - * output controls 1
 - * storage controls 1

Award 1 mark for each of the above and/or similar correct points, up to a maximum of 4.

- Administrative Controls
 - * segregation of duties 1
 - * operation controls 1
 - * file-library controls 1
 - * hardware controls 1

Award 1 mark for each of the above and/or similar correct points, up to a maximum of 4.

- General environment controls
 - * audit trails and other logs to record: 1
who logged on,
when they logged on, and
what they did.
 - * password protection and similar devices to help prevent “hacking” into the system being developed. 1
 - * strict regulations on procedures to prevent the introduction of computer viruses. 1
 - * conformity with the provisions of the Data-Protection Act (1994) and its various related guidelines. 1

Award 1 mark for each of the above and/or similar correct points, up to a maximum of 4.
(12)
(20)

Question 4

This question is based on Section 5.5 of the Open Learning Material.

Expenditure

Salaries and Wages	£	
Total management costs as at 1/9/99	69,500	
2% pay award 1/9/00 \		
5 months @ $69,500/12 \times 5 =$	28,958	
7 months @ $69,500 \times 1.02/12 \times 7 =$	41,352	
Total	70,310	<i>l</i>
Retirement Deputy Manager Supplies 30/9/00 \ Saving 6 months at $22,700 \times 1.02/2 =$	(11,577)	<i>l</i>
Total Management Salaries	58,733	
Total Administrators Salaries as at 1/9/99	183,000	
2% pay award 1/9/00 \		
5 months @ $183,000/12 \times 5 =$	76,250	
7 months @ $183,000 \times 1.02/12 \times 7 =$	108,885	
	185,135	<i>l</i>
Additional Administrative Asst WEF 1/10/00 @ $\pounds 12,500/12 \times 6 =$	6,250	<i>l</i>
Total Administrative Staff	191,385	
Total catering staff costs as at 1/9/99	1,580,000	
1.5% pay award 1/9/00 \		
5 months @ $1,580,000/12 \times 5 =$	658,333	
7 months @ $1,580,000 \times 1.015/12 \times 7 =$	935,492	
Total Catering Staff	1,593,825	<i>l</i>

Premises

Gas

Assume October actual represents $20\% + 15\% + (30\% \div 3) = 45\%$ 1/2

Project to year end = $\text{£}18,000/45 \times 100 =$ 40,000 1/2

5% saving on this level = $40,000 \times 95\% =$ 38,000 1

Electricity $\text{£}35,000 \times 1.015 =$ 35,525 1

Transport

$\text{£}3,500 \div 7 \times 12 \times 1.01 =$ 6,060 1

Catering Equipment

$\text{£}25,000 \div 7 \times 12 \times 75\% \times 1.02 =$ 32,786 1

Food

Average no. of meals sold current year = 2,000,000

Budgeted food cost = $\text{£}1,500,000$

\ average food cost per meal = $\text{£}0.75$

The estimated number of meals for 2000 – 2001 = 2,537,000

i.e. 2,137,000 plus 400,000 then budgeted food costs for 2000 – 2001 best estimate =

$2,537,000 \times \text{£}0.75 \times 1.01 = \text{£}1,921,778$

Marks to be allocated on the basis of the 'reasonableness' of the assumptions made. 3

Asset Rentals

No change full year cost = $\text{£}65,000$

Income

Expected value of meals:

Meals	Probability	EV	
1,800,000	0.20	360,000	
2,000,000	0.35	700,000	
2,200,000	0.30	660,000	
2,500,000	0.09	225,000	
3,000,000	0.04	120,000	
3,600,000	<u>0.02</u>	<u>72,000</u>	
	<u>1.00</u>	<u>2,137,000</u>	1½
Average Income Per Meal £	Probability	EV	
1.00	0.20	0.20	
1.30	0.25	0.33	
1.60	0.40	0.64	
1.80	0.10	0.18	
2.00	<u>0.05</u>	<u>0.10</u>	
	<u>1.00</u>	<u>1.45</u>	1½
Income =	2,137,000 x £1.45 = 3,098,650	Sales	½
	400,000 x £2.00 = 800,000	Free School Meals	½
	Total £3,898,650		

Marks in this section may be awarded for any reasonable assumptions and attempts to arrive at income figures.

Cateratonia Direct Services Original Outturn Budget
April 1 2000 – March 31 2001

Employees	£	
Managers	58,733	
Administrators	191,385	
Catering Staff	1,593,825	
Premises		
Electricity	35,525	
Gas	38,000	
Transport		
Travelling Expenses	6,060	
Supplies & Services		
Catering Equipment	32,786	
Food	1,921,778	
Capital		
Asset Rentals	65,000	
Total Expenditure	3,943,092	
Income		
School meals sales	3,898,650	
Surplus/(deficit)	(44,442)	<i>1</i>

NB Based on candidate's assumptions above

2 marks to be awarded for the format and neatness of presentation *2*

(20)

Question 5

This question relates to the Information Control and Budgetary Control elements of the syllabus. It is covered in the Open Learning materials in Section 4.1 and 6.1 and also in the update for 1998.

- (a) Definition of negative feedback control e.g. page 445 of the materials “Information feedback which forms the basis of control designed to dampen or reduce feedback fluctuations around a desired norm.” 1

The main elements of control are:

- Characteristic which can be controlled.
- Sensor which measures that characteristic (systems output).
- Standard against which to compare systems output.
- Comparator being a means of comparing output with the standard.
- Effector to act upon the feedback information and effect change in the system.

This could be usefully be explained through the use of a standard diagram such as Fig 66 in materials.

½ mark for first two elements and 1 mark for the other elements correctly identified.

4

The elements should be related to budgetary control. 1 mark for correctly doing this.

1
(6)

- (b) This section should concentrate upon the elements identified in section (a) and discuss the difficulties to be found at each stage. In the main this will come down to considering:

- Problems with information which is largely covered by the first four elements;
- Problems with effecting control which is the final element.

The marks for the section are to be split evenly between these two areas.

Problems with information can include:

- Accuracy;
- Timeliness and effect of delay;
- Comparisons made – phasing/profiling;
- Accounting basis – cash/accruals;
- Performance data;
- Form and presentation of reports.

1 mark for each valid point up to a maximum of 4.

Problems with effecting control can include:

- Timeliness and delay (but should only be credited once – see above);
- Taking the correct action and making the right choices;
- Ability and skills of budget holder;
- Motivation;
- Bureaucratic nature of control procedures.

1 mark for each valid point up to a maximum of 4
(8)

(c) People based problems are likely to be more difficult to solve than non people based problems. A contrast should be drawn between those parts of the system which involve people and those which are mechanical in nature.

- People may not be motivated or may lack skills.
- People may not have the time to do things.
- People may make involuntary mistakes.
- People are more difficult to change.
- Unprogrammed decisions may be unpredictable in their details and their outcomes.
- Decisions may be made upon judgement and may be subjective.

As a guide there are 1½ marks for each of the above points up to a limit of 6 but other points or similar ones expressed differently could be equally valid and should be given credit.

(6)
(20)

Question 6

This question relates to the budgetary control element of the syllabus and is covered by Section 6.3 of the Open Learning materials.

(a) **Arguments for and against standard costing and variance analysis**

For:

- Allows for flexible budgets and variations in level of activity.
- Relates budgets to outputs and performance.
- Analyses cost elements and increases understanding of costs.
- Provides more information on which to control budgets.
- Provides a standard to be aimed for.

Against:

- Problem of determining the right standard for performance purposes.
- Measurement of inputs.
- Closed system/static approach.
- Difficulty of interpreting and acting upon information.
- May be demotivating if standard not right.

There are likely to be other points. Give ½ mark per point up to a maximum of 2 for each of the points “for” and “against”.

4

(b) **Criteria for successful introduction of standard costing**

- Standard and easily identified output.
- Significant volume of standard products.
- Standardisation of methods of production and clear understanding of links between inputs and outputs.
- Techniques for identifying standard costs.
- Flexible budgeting.
- Budget managers and budget holders to have relevant skills and the motivation to use the techniques.

1 mark per point up to a maximum of 6 marks

- (c) Reasons why standard costing and variance analysis not used more extensively within the public sector. Most of this should come out of the criteria established in section (b).
- Lack of standardisation of outputs.
 - Output may not be easy to identify or measure.
 - Production (transformation) process may not be standard where service provision is essentially people based as is the case with service provision.
 - Public sector organisations may be required to work with fixed budgets.
 - Managers may lack skills and motivation.

1 mark per point up to a maximum of 4 marks

- (d) The answers to this may vary depending upon the student's own experience. This will determine whether they are able to identify an actual system or whether they will need to speculate upon an area where the methodology could be used. In choosing an area the student should consider such points as:
- Construction of standards;
 - Definition of standard outputs;
 - Measurement techniques;
 - Formats of variance reports;
 - The use of flexible budgets.

Up to 3 marks to be awarded for a basic description of the applied methodology, a further 3 marks for comment upon it.

6

(20)

Question 7

This question relates to the project management element of the syllabus and is covered in Section 7.4 of the Open Learning materials plus the CBT disk and the update for 1998.

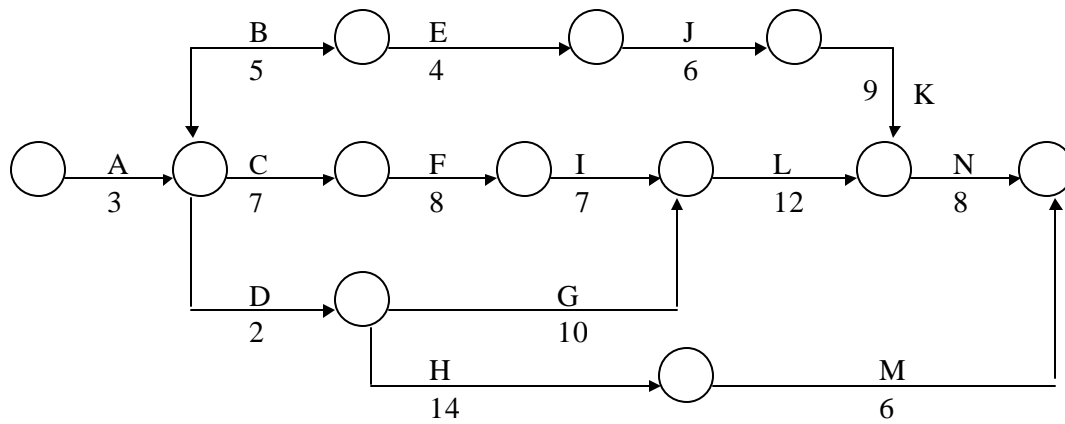
- (a) This requires a calculation of project time and cost.

The project time should be derived through the use of network analysis although it may be possible to do it more directly. The full process can be broken down into

- Draw the network;
- Identify the critical path and calculate the time taken.

Marks should be allocated for each part; 3 marks for correctly drawing the network and 2 marks for correctly calculating the time taken. If a student has simply worked out the time taken without doing the network they may be given 2 marks.

The network should look like this



3

This gives a critical path of ACFILN and a project time of 45 days.

2

The cost is given by	£
Fixed cost	20,000
Daily cost 45 x 1,000	<u>45,000</u>
	<u>65,000</u>

1
(6)

- (b) The minimum cost is calculated by looking at the potential for reducing the project time (saving 1,000 per day) taking into account the additional cost of the reduction.

The first step is to concentrate upon the critical path ACFILN

ACN are too expensive (£1,400)
 F is not possible

This leaves I and L

If I is reduced by 2 days and L by 4 days this will reduce the project time to 39 days. The revised cost will be

	£	£
Fixed cost		20,000
Daily cost 39 x 1,000		39,000
Reduction 6 x 700		<u>4,200</u>
Minimum cost		<u>63,200</u>

2 marks for the correct logic and 2 marks for the correct calculation.

4

Further reduction can only be effected by using more expensive options which have a cost of £1,400 or net cost of £400 per day. Only two further days reductions can be effected to still stay within budget. This can be in relation to either A, C or N. The new cost will be £64,000 for 37 days (Minimum time).

4

(8)

(c)

Briefing note for Chief Executive

Format 1

Outline of options available and summary of time and cost implications 2

Recommendations 1

Explanation of what a GANNT chart is, including purpose, and indication of how a GANNT chart could be used for this project. 2

(6)

(20)