

CIMA INTERIM ASSESSMENT

Performance Operations

November 2011

Time allowed

Reading and planning: 20 minutes

Writing: 3 hours

ALL questions are compulsory and **MUST** be attempted.

Maths tables and formulae are on pages 3 – 7

Do NOT open this paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

Kaplan Publishing/Kaplan Financial

KAPLAN
PUBLISHING

Paper P1

© Kaplan Financial Limited, 2011

The text in this material and any others made available by any Kaplan Group company does not amount to advice on a particular matter and should not be taken as such. No reliance should be placed on the content as the basis for any investment or other decision or in connection with any advice given to third parties. Please consult your appropriate professional adviser as necessary. Kaplan Publishing Limited and all other Kaplan group companies expressly disclaim all liability to any person in respect of any losses or other claims, whether direct, indirect, incidental, consequential or otherwise arising in relation to the use of such materials.

All rights reserved. No part of this examination may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without prior permission from Kaplan Publishing.

MATHS TABLES AND FORMULAE

PRESENT VALUE TABLE

Present value of £1, i.e. $(1 - r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

CUMULATIVE PRESENT VALUE OF £1

This table shows the present value of £1 per annum, receivable or payable at the end of each year for n years $\frac{1-(1+r)^n}{r}$.

Periods	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

FORMULAE

Probability

$A \cup B$ = A or B

$A \cap B$ = A and B (overlap)

$P(B/A)$ = probability of B, given A

Rules of addition

If A and B are mutually exclusive: $P(A \cup B) = P(A) + P(B)$

If A and B are not mutually exclusive: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Rules of multiplication

If A and B are independent: $P(A \cap B) = P(A) \times P(B)$

If A and B are not independent: $P(A \cap B) = P(A) \times P(B/A)$

$E(x)$ = \sum (probability \times payoff)

Quadratic equations

If $ax^2 + bx + c = 0$ is the general quadratic equation, the two solutions (roots) are given by:

$$x = \frac{b \pm \sqrt{b^2 - 4ac}}{2a}$$

Descriptive statistics

Arithmetic mean

$$\bar{x} = \frac{\sum x}{n} \quad \bar{x} = \frac{\sum fx}{\sum f} \text{ (frequency distribution)}$$

Standard deviation

$$SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} \quad SD = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2} \text{ (frequency distribution)}$$

Index numbers

$$\text{Price relative} = 100 \times P_1/P_0$$

$$\text{Quantity relative} = 100 \times Q_1/Q_0$$

$$\text{Price: } \frac{\sum w \times \left(\frac{P_1}{P_0} \right)}{\sum w} \times 100$$

$$\text{Quantity: } \frac{\sum w \times \left(\frac{Q_1}{Q_0} \right)}{\sum w} \times 100$$

Time series

Additive model

$$\text{Series} = \text{Trend} + \text{Seasonal} + \text{Random}$$

Multiplicative model

$$\text{Series} = \text{Trend} \times \text{Seasonal} \times \text{Random}$$

Linear regression and correlation

The linear regression equation of y on x is given by:

$$y = a + bx \text{ or } y - \bar{y} = b(x - \bar{x})$$

where

$$b = \frac{\text{Covariance}(xy)}{\text{Variance}(x)} = \frac{n \sum xy - (\sum x)(\sum y)}{n \sum x^2 - (\sum x)^2}$$

and

$$a = \bar{y} - b\bar{x}$$

or solve

$$\sum y = na + b \sum x$$

$$\sum xy = a \sum x + b \sum x^2$$

Coefficient of correlation

$$r = \frac{\text{Covariance}(xy)}{\sqrt{\text{Var}(x)\text{Var}(y)}} = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{\{n \sum x^2 - (\sum x)^2\}\{n \sum y^2 - (\sum y)^2\}}}$$

$$R(\text{rank}) = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

Financial mathematics

Compound interest (values and sums)

Future value S , of a sum of X , invested for n periods, compounded at $r\%$ interest:

$$S = X [1+r]^n$$

Annuity

Present value of an annuity of £1 per annum receivable or payable for n years, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r} \left(1 - \frac{1}{[1+r]^n} \right)$$

Perpetuity

Present value of £1 per annum, payable or receivable in perpetuity, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r}$$

SECTION A

Answer ALL 10 sub-questions in this section

QUESTION 1

1.1 The fixed overhead volume variance is defined as:

- A The difference between the budgeted value of the fixed overheads and the standard fixed overheads absorbed by actual production
 - B The difference between the standard fixed overhead cost specified for the production achieved, and the actual fixed overhead cost incurred
 - C The difference between budgeted and actual fixed overhead expenditure
 - D The difference between the standard fixed overhead cost specified in the original budget and the same volume of fixed overheads, but at the actual prices incurred
- (2 marks)**

1.2 BC Ltd makes a single product with the following details:

	£/unit
Selling price	45
Direct materials	18
Direct labour	6
Variable overhead	2
Fixed overhead	5

Production was 57,000 units and sales 50,000 units. Opening stock was 24,587 units. The profit calculated using marginal costing was £650,000. The profit using absorption costing is:

- A £650,000
 - B £670,000
 - C £685,000
 - D £700,000
- (2 marks)**

1.3 BD Ltd uses a standard absorption costing system. Details for period 3 were:

	<i>Budget</i>	<i>Actual</i>
Sales units	5,000	5,110
Selling price per unit	£20	£19.50
Profit per unit	£5	£4.80

The sales price and volume variances for period 3 were:

	Volume	Price	
A	£528 (F)	£2,500 (A)	
B	£528 (F)	£2,555 (A)	
C	£550 (F)	£2,500 (A)	
D	£550 (F)	£2,555 (A)	(2 marks)

1.4 Which of the following statements is/are true?

- (i) Computer-integrated manufacturing (CIM) brings together advanced manufacturing technology and modern quality control into a single computerised coherent system.
- (ii) Flexible manufacturing systems (FMS) are simple systems with low levels of automation that offer great flexibility through a skilled workforce working in teams.
- (iii) Electronic data interchange (EDI) is primarily designed to allow the operating units in an organisation to communicate immediately and automatically with the sales and purchasing functions within the organisation.

- A (i) only
 - B (i) and (ii) only
 - C (i) and (iii) only
 - D (ii) and (iii) only
- (2 marks)**

1.5 BE Ltd uses a throughput accounting system. Product A sells for £60 per unit. Its cost details are as follows:

	£
Direct material	15
Direct labour	10
Variable production overhead	6
Fixed production overhead	12
	—
Standard production cost	43
	—

Each unit needs 0.4 hours on the bottleneck resource and altogether there are 15,000 bottleneck hours available.

The full factory costs are £900,000.

The throughput accounting ratio is closest to:

- A 1.61
- B 1.40
- C 1.88
- D 45.00

(2 marks)

1.6 The following information relates to BK plc for October:

Bought 7,800 kg of material R at a total cost of £16,380.

Stocks of material R increased by 440 kg.

Stocks of material R are valued using standard purchase price.

Material price variance was £1,170 Adverse.

The standard price per kg for material R is:

- | | Price
£/kg |
|---|---------------|
| A | 1.95 |
| B | 2.10 |
| C | 2.23 |
| D | 2.25 |

(2 marks)

1.7 Summary results for Potions Ltd for January are shown below.

	£000
Sales revenue	570
Variable production costs	210
Variable selling costs	36
Fixed production costs	97
Fixed admin costs	78.5

Potions Ltd expected to produce 1,000 units during the month but actually managed to produce 1,200 units. Opening inventory was 100 units and the company sold 900 units.

Calculate the profit under marginal costing

- A £148,500
- B £201,000
- C £376,500
- D £230,000

(2 marks)

1.8 The costs of a customer service team who deal with complaints from customers could be classified as what under a TQM system:

- A Appraisal costs
 - B Prevention costs
 - C External failure costs
 - D Internal failure costs
- (2 marks)**

1.9 Sands Ltd has recently introduced an activity based costing system. It manufactures two products – the 'Storm' and the 'Castle' – details of which are set out below.

	<i>Storm</i>	<i>Castle</i>
Budgeted production (units)	10,000	5,000
Batch size (units)	200	500
Machine set ups per batch	5	3

The budgeted set up cost for the period is \$16,800.

The budgeted machine set up cost for one unit of the 'Storm' is nearest to:

- A £1.68
 - B £1.20
 - C £1.50
 - D £1.93
- (2 marks)**

1.10 Which ONE of the following would NOT explain a favourable direct materials usage variance?

- A Using a higher quality of materials than that specified in the standard.
 - B A reduction in materials wastage rates.
 - C An increase in suppliers' quality control checks.
 - D Achieving a lower output volume than budgeted.
- (2 marks)**

(Total for Section A: 20 marks)

SECTION B

Answer ALL six parts of this question. Each sub-question is worth 5 marks

QUESTION 2

(a) Explain the meaning and relevance of inter-dependence of variances when reporting to managers. (5 marks)

(b) D Ltd has the following standard cost card:

	\$
Selling price	5,000
Variable production cost	(3,000)
Fixed production cost	(1,000)
	—————
Profit per unit	1,000
	—————

Budgeted production and sales were 10 units per week.

Calculate the company's weekly break-even point and margin of safety (in % terms), and explain what is meant by the margin of safety (5 marks)

The following information is required for parts (c) and (d) of this question.

BF Ltd produces three products, using three different machines. The following data is available for October:

	<i>Product X</i>	<i>Product Y</i>	<i>Product Z</i>
Throughput per unit	£20	£16	£10
Machine hours required per unit			
Machine 1	10	5	3
Machine 2	13	7	2
Machine 3	5	3	4
Estimated demand (units)	200	100	150

Maximum machine capacity is 2,000 hours per machine.

Total factory cost is £10,300 for October.

(c) Which machine has the lowest utilisation rate for October, and what is it? Which machine is the bottleneck machine? (5 marks)

(d) Establish the optimum allocation of the bottleneck machine hours to the three products. (5 marks)

(e) Just in time

Explain in a memo format to the managing director of a company the internal and external relationships that are necessary for successful implementation of a Just in Time system. (5 marks)

(f) Variance analysis

Explain whether it is important to investigate all of the variances in an organisation and what information is required from such an investigation. (5 marks)

(Total for Section B: 30 marks)

SECTION C

Answer ALL questions

QUESTION 3

Q Ltd operates a system of standard costing and in respect of one of its products, which is manufactured within a single cost centre, the following information is given.

For one unit of product the standard material input is 16 litres at a standard price of £2.50 per litre. The standard wage rate is £5 per hour and 6 hours are allowed in which to produce one unit. Fixed production overhead is absorbed at the rate of 120% of direct wages cost.

During the last four-week accounting period:

The material price variance was extracted on purchase and the actual price paid was £2.45 per litre.

Total direct wages cost was £121,500.

Fixed production overhead incurred was £150,000.

<i>Variances</i>	<i>Favourable</i>	<i>Adverse</i>
	£	£
Direct material price	8,000	
Direct material usage		6,000
Direct labour rate		4,500
Direct labour efficiency	3,600	
Fixed production overhead expenditure		6,000

Required:

(a) Calculate for the four-week period:

- (i) budgeted output in units**
- (ii) number of litres purchased**
- (iii) number of litres used above standard allowed**
- (iv) actual units produced**
- (v) actual hours worked**
- (vi) average actual wage rate per hour. (20 marks)**

(b) Explain why it is useful to analyse variances between planning and operational variances. (5 marks)

(Total: 25 marks)

QUESTION 4

BML has three product lines: P1, P2 and P3. Since its creation the company has been using a single direct labour cost percentage to assign overhead costs to products.

Despite P3, a relatively new line, attracting additional business, increasing overhead costs and a loss of market share, particularly for P2, a major product, have convinced the management that the costing system is in need of some development. A team, led by the management accountant was established to develop an improved system of costing based on activities. The team spent several weeks collecting data (see tables below) for the different activities and products. For the accounting period in question, given in the tables below is data on BML's three product lines and overhead costs:

	P1	P2	P3
Production volume	7,500 units	12,500 units	4,000 units
Direct labour cost per unit	£4	£8	£6.40
Material cost per unit	£18	£25	£16
Selling price per unit	£47	£80	£68
Materials movements (in total)	4	25	50
Machine hours per unit	0.5	0.5	0.2
Set-ups (in total)	1	5	10
Proportion of engineering work	30%	20%	50%
Orders packed (in total)	1	7	22

Activities	Overhead cost £
Material receiving and handling	150,000
Machine maintenance and depreciation	390,000
Set-up labour	18,688
Engineering	100,000
Packing	<u>60,000</u>
Total	<u>718,688</u>

Required:

- (a) Calculate the overhead rate and the product unit costs under the existing costing system. (8 marks)
- (b) Identify for each overhead activity, an appropriate cost driver from the information supplied, and then calculate the product unit costs using a system that assigns overheads on the basis of the use of activities. (10 marks)
- (c) Describe some characteristics of modern production facilities use by present day manufacturers and explain why activity based costing might be best suited to such organisations. (7 marks)

(Total: 25 marks)

(Total for Section C: 50 marks)

You May contact QQ:139169828 MSN: q7jw00001@hotmail.com For More Information !

CIMA P1 PERFORMANCE OPERATIONS

You May contact QQ:139169828 MSN: q7jw00001@hotmail.com For More Information !