SECTION A

Answer to Question One

Rationale

This question addresses issues arising from syllabus area C3(d): Discuss the criticisms of budgeting, particularly from the advocates of ‘beyond budgeting’ techniques.

Suggested Approach

Candidates needed to provide a brief overview of zero-based budgeting (ZBB) and then explain the main stages that would need to be undertaken to introduce ZBB into the Research and Development Division of the company.
In a ZBB system all activities are justified and prioritised before decisions about the allocation of funds are made. ZBB focuses on programmes or activities instead of functional departments based on line items as with traditional budgets. Funds are allocated on the basis of a cost-benefit analysis. ZBB questions long standing agreements and assumptions.

There are three main stages involved in the introduction of ZBB:

I. A description of each organisational activity in a decision package
II. The evaluation and ranking of decision packages in order of priority
III. Allocation of resources based on order of priority up to the spending cut-off level.

Decision packages are identified for each decision unit. Decision units represent separate programmes or group of activities that an organisation undertakes. A decision package represents the operation of a particular programme with incremental packages reflecting different levels of effort that may be expended on a specific function. One package is usually prepared at the ‘base’ level for each programme. This package represents the minimum level of service or support consistent with the organisation’s objectives. Service or support higher than the base level is described in one or more incremental packages. For example, managers might be asked to specify the base package in terms of level of service that can be provided at 70 per cent of the current cost level and incremental packages identify higher activity or cost levels.

Once the decision packages have been completed, management is ready to start to review the process. To determine how much to spend and where to spend it, management will rank all packages in order of decreasing benefits to the organisation. Theoretically, once management has set the budgeted level of spending, the packages should be accepted down to the spending level based on cost-benefit principles.
The answer for question two is on the next page
Answer to Question Two

Rationale
This question requires an understanding of life cycle costing as shown in syllabus area B1(i): Discuss the concept of life cycle costing and how life cycle costs interact with marketing strategies at each stage of the life cycle.

Suggested Approach
Candidates needed to be aware that the product is “innovative” and that a “market skimming pricing policy” had been adopted. Answers should then explain the implications of these facts for the unit selling price and unit production costs as the product moves into the growth and maturity phases of its life cycle.

Growth Stage
Compared to the introduction stage the likely changes are as follows:

Unit selling prices
These are likely to be reducing for a number of reasons:
• The product will become less unique as competitors use reverse engineering to introduce their versions of the product.
• CD may wish to discourage competitors from entering the market by lowering the price and thereby lowering the unit profitability.
• The price needs to be lowered so that the product becomes attractive to different market segments thus increasing demand to achieve the growth in sales volume.

Unit production costs
These are likely to reduce for a number of reasons:
• Direct materials are being bought in larger quantities and therefore CD may be able to negotiate better prices from its suppliers thus causing unit material costs to reduce
• Direct labour costs may be reducing if the product is labour intensive due to the effects of the learning and experience curves.
• Other variable overhead costs may be reducing as larger batch sizes reduce the cost of each unit.
• Fixed production costs are being shared by a greater number of units.

Maturity Stage
Compared to the growth stage the likely changes are as follows:

Unit selling prices
These are unlikely to be reducing any longer as the product has become established in the market place. This is a time for consolidation and whilst there may be occasional offers to tempt customers to buy the product the selling price is likely to be fairly constant during this period.
Unit production costs

Direct material costs are likely to be fairly constant in this phase and may even rise as the quantities required diminish compared to those required in the growth stage with the consequential loss of negotiating power.

Direct labour costs are unlikely to be reducing any longer as the effects of the learning and experience curves have ended. Indeed the workers may have started working on the next product so that their attention towards this product has diminished with the result that these costs may increase.

Overhead costs are likely to be similar to those of the end of the growth phase as optimum batch sizes have been established and are more likely to be used in this maturity stage of the product life cycle where demand is more easily predicted.
Answer to Question Three

Rationale

This question requires the application of learning curve theory as stated in syllabus area B1(e): Apply learning curves to estimate time and cost for new products and services.

Suggested Approach

(a) (i) To calculate the time needed for the 8th batch candidates needed to calculate the difference between the total time for eight batches and the total time for seven batches.

(b) Candidates needed to calculate the target labour cost and then derive the rate of learning needed to be exhibited to achieve it.

(a)

(i)

Cumulative average direct labour cost for 8 batches:
\[ y = ax^b \]
\[ y = 35,000 \times 8^{-0.152} = 25,515 \]
The total direct labour cost for eight batches = 8 \times $25,515 = $204,120

Cumulative average direct labour cost for 7 batches:
\[ y = ax^b \]
\[ y = 35,000 \times 7^{-0.152} = 26,038 \]
The total direct labour cost for 7 batches = 7 \times $26,038 = $182,266

Direct labour cost for 8th batch = $21,854

(ii)

Total labour cost over the product's life = $204,120 + (8 \times $21,854) = $378,952

Sales less non labour related cost over the product's life = 16,000 \times ($82 - $40) = $672,000

Contribution = $293,048

(b)

In order to achieve a contribution of $400,000 the total labour cost over the product’s lifetime would have to equal ($672,000 - $400,000) = $272,000

This equals an average batch cost of $272,000 / 16 = $17,000

This represents $17,000 / $35,000 = 48.571% of the cost of the first batch

16 batches represents 4 doublings of output

Therefore the rate of learning required = 4 \times 0.48571 = 83.482%
Answer to Question Four

Rationale

This question requires the application of a balanced scorecard to a banking organisation and addresses syllabus areas C3(b): Discuss the role of non-financial performance indicators, and C3(c): Compare and contrast traditional approaches to budgeting with recommendations based on the ‘balanced scorecard’.

Suggested Approach

Candidates needed to be aware that the question was set in the context of a large banking organisation. The performance measures suggested needed to be applicable in such an organisation.

Internal Business Process Perspective

Objective: Cross-sell products

Measure: Products purchased per customer

Why: this provides a measure of customer satisfaction. If customers are happy with how the bank operates they will be more likely to use the bank for differing kinds of services e.g. loans, insurance, savings etc rather than using other banks.

Learning and Growth Perspective

Objective: Increase the number of new products and services sold.

Measure: number of customers buying the new products/using the new services.

Why: The bank needs to offer a range of products and services in order to be competitive. The uptake of the new products/services offered (e.g. internet banking) will provide a measure of their acceptability and relevance.

Customer Perspective

Objective: Increase customer loyalty

Measure: Number of accounts closed

Why: if customers close their accounts it is a sign that they are not happy with the services provided by the bank. The reasons for customers closing their accounts should be investigated and action taken where appropriate to improve the service offered with a view to retaining existing customers and attracting new ones.

Note: other objectives and measures are acceptable but they must relate to the bank’s goal.
Answer to Question Five

Rationale

Parts (a) (i) and (ii) address syllabus area A2(b): Interpret variable/fixed cost analysis in multiple product contexts to break-even analysis and product mix decision making, including circumstances where there are multiple constraints and linear programming methods are needed to identify 'optimal' solutions. Part (b) addresses syllabus area C2(c): Evaluate performance using fixed and flexible budget reports.

Suggested Approach

Part (a): it is necessary to calculate the weighted average contribution to sales ratio. This will then enable the break-even revenue to be determined. A continuation of the analysis will allow the revenue needed to generate the target profit to be calculated. This can then be split into the required product mix.

Part (b): candidates needed to be aware that the company used standard marginal costing and then calculate the weighted average contribution per unit. The variances should then be valued using this figure.

(a)(i)

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<th>F</th>
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<td>Weighted c/s ratio</td>
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Break-even revenue = fixed costs/(c/s ratio) = $31,200/.60 = $52,000

(ii)

A profit of $29,520 would mean that the contribution needed to generated would be $29,520 + $31,200 = $60,720.

Weighted contribution per unit = $48,600 / 1,200 = $40.50

Therefore number of units needed to be sold = $60,720 / $40.50 = 1,500 units.

These would be in the mix of 375D, 500E and 625F

(b)

(i)

Market size variance = (7,500 – 6,000) * 20% * $40.50 = $12,150 favourable

(ii)

Market share variance = (1,740 – 1,500) * $40.50 = $9,720 favourable
SECTION B

Answer to Question Six

Rationale

Part (a) requires an understanding of short-term decision making and addresses syllabus area A2(a): Explain the usefulness of dividing costs into variable and fixed components in the context of short-term decision making. Parts (b) and (c) focus on syllabus area A3(a): Apply an approach to pricing based on profit maximisation in imperfect markets. Part (d) requires an understanding of value analysis as stated in syllabus area B1(a): Compare and contrast value analysis and functional cost analysis.

Suggested Approach

Part (a) follows the procedure for the allocation of a single scarce resource i.e. maximise contribution per hour.
Part (b) required the tabulation of the marginal contribution gained by each batch of the two products. The marginal contributions are then used as the basis of the allocation of the resources.
Part (c) eliminated the need for batch production and therefore the economists' pricing model could be used to assess the impact of hiring the machine.
Part (d) required a discussion of value analysis and its worth in a given context. Candidates needed to be aware of the context.

(a)

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Total contribution: $264,000
(b)

Product X

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Product Z

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<td>18,000</td>
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</table>

The optimum production plan is 7,000X and 8,000Z. This will earn a total contribution of $267,000 per month.

(c)

From the information it can be seen that the relationships between price and demand for the products are as follows:

Product X: P = 36 - 0.001x
Product Z: P = 48 - 0.001x

The maximum contribution from Product X can be calculated as follows:

12 = 36 - .002x
0.002x = 24
x = 12,000 units
P = $24

Maximum contribution from Product X = 12,000 * (24-12) = $144,000
The maximum contribution from Product Z can be calculated as follows:

\[ 21.50 = 48 - 0.002x \]
\[ 0.002x = 26.50 \]
\[ x = 13,250 \]
\[ P = $34.75 \]

Maximum contribution from Product Z = 13,250 * (34.75 - 21.50) = $175,562.50

Total maximum contribution = $319,562.50

Therefore the maximum that should be paid to hire the machine is $319,562.50 – $267,000 = $52,562.50 per month.

\((d)\)

Value Analysis is a systematic interdisciplinary examination of the factors which affect the cost of a product or service in order to determine the means of achieving the specified purpose in the most economical manner while meeting the required level of quality and reliability.

Value Analysis may therefore be viewed as a cost reduction and problem solving technique that analyses an existing product or service in order to identify and reduce or eliminate any costs which do not contribute to value or performance.

It is clear from the scenario that AC needs to be able to reduce its selling prices in order to compete in the market. This selling price reduction can only be sustained by a reduction in Product Y’s unit costs, but the reduction must not be achieved by compromising on quality. However the competitor’s product is also technically superior. This suggests that even with a lower price Product Y may not be able to survive in the market.
## Answer to Question Seven

### Rationale

Parts (a), (b) and (c) test the understanding of transfer pricing and its impact on profits, as required by syllabus area D3(c): Discuss the likely consequences of different approaches to transfer pricing for divisional decision making, divisional and group profitability, the motivation of divisional management and the autonomy of individual divisions. Part (d) explores the relationship between transfer prices, performance measurement and management behaviour, which relates to syllabus area D3(b): Discuss the typical consequences of a divisional structure for performance measurement as divisions compete or trade with each other.

### Suggested Approach

Part (a): using the information given it was necessary to determine the action of the manager of Division BB. The resulting output of Division BB determined the output for Division AA and therefore the profits of both divisions and the group.

Part (b): candidates needed to be aware that to maximise profits the marginal costs of both divisions should be used to determine the contribution from Product B and the optimal price and output.

Part (c): this required profit calculations based on a given transfer price (and this was the price that candidates should have used in (b)).

Part (d): this required an understanding of the impacts of transfer prices on the profits and therefore motivation of divisional managers. Candidates needed to discuss these issues and suggest how they can be overcome.
(a)

The situation is governed by the actions of the manager of BB. Based on a transfer price of $45 per component, the total variable cost per unit of Product B will be $54.

<table>
<thead>
<tr>
<th>Demand</th>
<th>SP $</th>
<th>VC $</th>
<th>Cont per unit $</th>
<th>Total contribution $</th>
</tr>
</thead>
<tbody>
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<td>1,000 units</td>
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<td>66</td>
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<td>67</td>
<td>54</td>
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<td>78,000</td>
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</table>

BB will produce 4,000 units of Product B and will therefore order 4,000 of Component A from AA.

<table>
<thead>
<tr>
<th>AA</th>
<th>BB</th>
<th>ZZ Group</th>
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<tbody>
<tr>
<td>Revenue</td>
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<tr>
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</tr>
<tr>
<td>Profit</td>
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</table>

(b)

The situation for the group should be judged using the total marginal costs of the divisions. This will give a variable cost per Product B of $24.

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The profit maximising output is 5,000 units of Product B. This will earn a total monthly profit for the ZZ Group of $280,000 - $125,000 = $155,000.

(c)

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(d)

If marginal cost is used as the transfer price the manager of the AA division will not be motivated as there will be no contribution towards the division’s fixed costs. The calculations above show that if marginal cost is used as the transfer price AA division will record a loss i.e. the size of the fixed costs. If the divisional performance measure is Return on Capital Employed the AA division will be at a disadvantage compared to the BB division.

However using marginal cost as the transfer price will maximise the overall group profit. Therefore there is conflict between ‘group’ and ‘division’. The situation could be overcome by the use of a ‘dual pricing’ system or a ‘two-part tariff’ approach.

**Dual pricing transfer pricing**

A dual rate transfer price uses two separate transfer prices to price each inter-divisional transaction e.g. the supplying division may receive the full cost, plus a mark-up on each transaction and the receiving division may be charged at the marginal cost of each of the transfers. The supplier transfer price is intended to match the market price of the goods or services transferred. The mark-up for the supplying division is assumed to be sufficient to cover its fixed costs and also provide a profit contribution.

This method of transferring with the receiving division being charged at the marginal cost of the supplying division, should ensure that decisions are made that are optimal from the group’s perspective. This approach should also meet the performance evaluation of the supplying division since each unit transferred generates a profit. For this reason the supplying division manager is motivated to transfer the product internally.

The outcome of this approach will show the contribution for the group as a whole is less than the sum of the divisional profits. This can be resolved quite simply by a head office accounting adjustment.

**Two-part tariff transfer pricing**

This approach applies particularly where the supplying division has no capacity constraints. All transfers are made at the short-term marginal cost. The supplying division also charges the receiving division a fixed fee for the privilege of obtaining these transfers at the marginal cost.

The receiving division equates its marginal costs to its marginal revenue to determine the optimum profit-maximising output level.

The supplying division can recover its fixed costs and earn a profit on the inter-divisional transfers through the fixed fee each period. The fixed fee is intended to compensate the supplying division for tying up some of its capacity for providing products or services that are transferred internally.

The fee is meant to cover a representative portion of the supplying division’s fixed cost, plus a further charge to reflect the required return on capital.

Another possibility could be ‘a negotiated transfer price’.