Fundamentals Level – Applied Skills

Performance Management

Specimen Exam applicable from
September 2016

Paper PM

Time allowed: 3 hours 15 minutes

This question paper is divided into three sections:

Section A – ALL 15 questions are compulsory and MUST be attempted

Section B – ALL 15 questions are compulsory and MUST be attempted

Section C – BOTH questions are compulsory and MUST be attempted

Formulae Sheet is on page 16.

Do NOT open this question paper until instructed by the supervisor.

Do NOT record any of your answers on the question paper.

This question paper must not be removed from the examination hall.

Think Ahead ACCA

The Association of Chartered Certified Accountants

Section A – ALL 15 questions are compulsory and MUST be attempted

Please use the grid provided on page two of the Candidate Answer Booklet to record your answers to each multiple choice question. Do not write out the answers to the MCQs on the lined pages of the answer booklet.

Each question is worth 2 marks.

1 A company manufactures two products, C and D, for which the following information is available:

	Product C	Product D	Total
Budgeted production (units)	1,000	4,000	5,000
Labour hours per unit/in total	8	10	48,000
Number of production runs required	13	15	28
Number of inspections during production	5	3	8

Total production set up costs	$140,000
Total inspection costs	$80,000
Other overhead costs	$96,000

Other overhead costs are absorbed on a labour hour basis.

Using activity-based costing, what is the budgeted overhead cost per unit of Product D?

A $43·84
B $46·25
C $131·00
D $140·64

2 The selling price of Product X is set at $550 for each unit and sales for the coming year are expected to be 800 units.

A return of 30% on the investment of $500,000 in Product X will be required in the coming year.

What is the target cost for each unit of Product X?

A $385·00
B $165·00
C $187·50
D $362·50

3 P Co makes two products, P1 and P2. The budgeted details for each product are as follows:

	P1	P2
	$	$
Selling price	10·00	8·00
Cost per unit:		
Direct materials	3·50	4·00
Direct labour	1·50	1·00
Variable overhead	0·60	0·40
Fixed overhead	1·20	1·00
Profit per unit	3·20	1·60

Budgeted production and sales for the year ended 30 November 20X5 are:

Product P1   10,000 units
Product P2   12,500 units

The fixed overhead costs included in P1 relate to apportionment of general overhead costs only. However, P2 also included specific fixed overheads totalling $2,500.

If only product P1 were to be made, how many units (to the nearest whole unit) would need to be sold in order to achieve a profit of $60,000 each year?

A   25,625 units
B   19,205 units
C   18,636 units
D   26,406 units

4 **Which of the following statements regarding environmental cost accounting are true?**

(1) The majority of environmental costs are already captured within a typical organisation's accounting system. The difficulty lies in identifying them
(2) Input/output analysis divides material flows within an organisation into three categories: material flows; system flows; and delivery and disposal flows
(3) One of the cost categories used in environmental activity-based costing is environment-driven costs which is used for costs which can be directly traced to a cost centre
(4) Environmental life-cycle costing enables environmental costs from the design stage of the product right through to decommissioning at the end of its life to be considered

A   (1), (2) and (4)
B   (1) and (4) only
C   (1), (3) and (4)
D   (2) and (3) only

5 To produce 19 litres of Product X, a standard input mix of 8 litres of chemical A and 12 litres of chemical B is required.

Chemical A has a standard cost of $20 per litre and chemical B has a standard cost of $25 per litre.

During September, the actual results showed that 1,850 litres of Product X were produced, using a total input of 900 litres of chemical A and 1,100 litres of chemical B.

The actual costs of chemicals A and B were at the standard cost of $20 and $25 per litre respectively.

Based on the above information, which of the following statements is true?

A   Both variances were adverse
B   Both variances were favourable
C   The total mix variance was adverse and the total yield variance was favourable
D   The total mix variance was favourable and the total yield variance was adverse

[P.T.O.

6 A budget is a quantified plan of action for a forthcoming period. Budgets can be prepared using a variety of different approaches.

Which of the following statements regarding approaches to budgeting are correct?

(1) Incremental budgeting builds previous inefficiencies into the budget whereas zero-based budgeting encourages employees to avoid wasteful expenditure
(2) Beyond budgeting uses adaptive management processes and plans on a rolling basis
(3) Activity-based budgeting ensures that the budget is continually updated by adding a new budget period once the most recent budget period has ended
(4) Flexible budgeting recognises different cost behaviour patterns and so takes into account the organisation's overall strategy during the budget process

A (1) and (2) only
B (1), (2) and (4)
C (3) and (4)
D (1) and (3)

7 A leisure company owns a number of large health and fitness resorts, but one is suffering from declining sales and is predicted to make a loss in the next year. As a result management have identified a number of possible actions:

(1) Shut down the resort and sell off the assets
(2) Undertake a major upgrade to facilities costing $4·5m
(3) Undertake a minor upgrade to facilities costing $2m

The upgrades are predicted to have variable results and the probability of good results after a major upgrade is 0·8, whereas the probability of good results after a minor upgrade is 0·7.

The company is risk neutral and has prepared the following decision tree.

Key
Decision □
Outcome ○
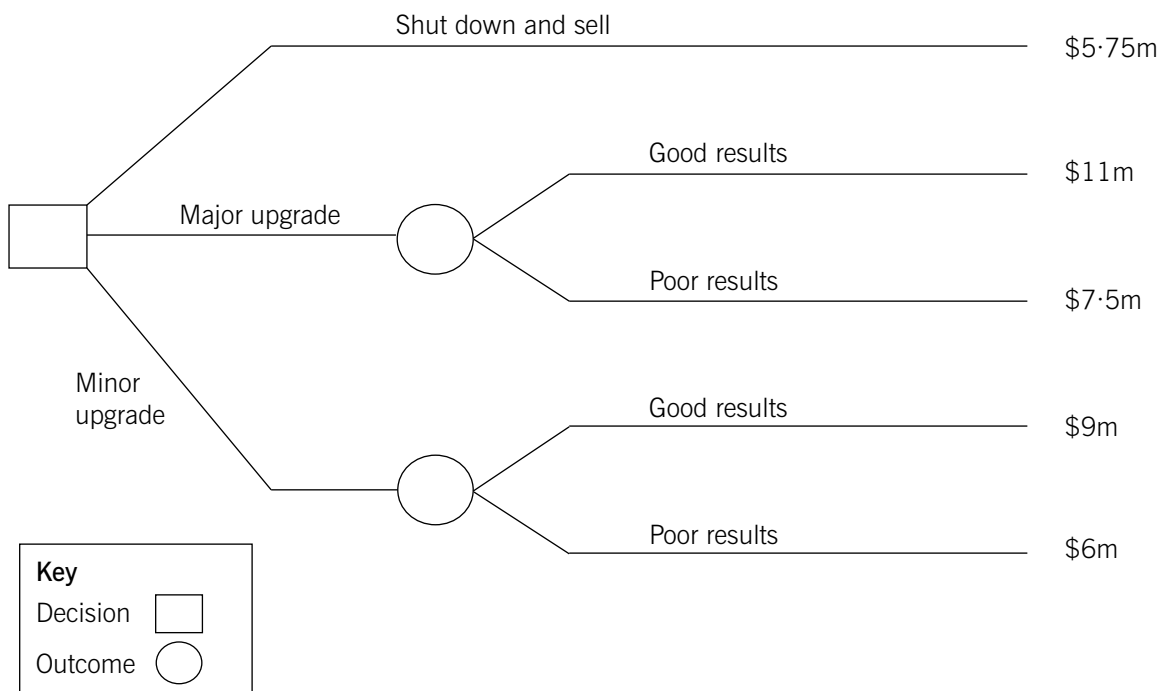
Which decision should the company make?

A Shutdown and sell
B Undertake the major upgrade
C Undertake the minor upgrade
D Undertake the major upgrade if results are good

8 A company has the following production planned for the next four weeks. The figures reflect the full capacity level of operations. Planned output is equal to the maximum demand per product.

Product	A	B	C	D
	$ per unit	$ per unit	$ per unit	$ per unit
Selling price	160	214	100	140
Raw material cost	24	56	22	40
Direct labour cost	66	88	33	22
Variable overhead cost	24	18	24	18
Fixed overhead cost	16	10	8	12
Profit	30	42	13	48
Planned output	300	125	240	400
Direct labour hours per unit	6	8	3	2

It has now been identified that labour hours available in the next four weeks will be limited to 4,000 hours.

In what order should the products be manufactured, assuming that the company wants to maximise profits in the next four weeks?

A D, A, C, B
B D, B, A, C
C B, A, D, C
D D, C, A, B

9 Def Co provides accounting services to government departments. On average, each staff member works six chargeable hours per day, with the rest of their working day being spent on non-chargeable administrative work. One of the company's main objectives is to produce a high level of quality and customer satisfaction.

Def Co has set its targets for the next year as follows:

(1) Cutting departmental expenditure by 5%
(2) Increasing the number of chargeable hours handled by advisers to 6·2 per day
(3) Obtaining a score of 4·7 or above on customer satisfaction surveys

Which of the following options allocates the above targets to the correct value for money performance category?

	Economy	Efficiency	Effectiveness
A	(1)	(3)	(2)
B	(2)	(1)	(3)
C	(3)	(2)	(1)
D	(1)	(2)	(3)

10 Different types of information systems provide the information which organisations need for strategic planning, management and operational control.

Which of the following statements are correct?

(1) Management information systems (MIS) summarise internal data into periodic reports
(2) Transaction processing systems (TPS) facilitate the immediate processing of data
(3) Executive information systems (EIS) utilise dashboard facilities and interactive graphics
(4) Enterprise resource planning systems (ERPS) can be set up with extranet links to suppliers and customers

A (1), (2) and (3) only
B (1) and (3) only
C (2) and (4) only
D (1), (2), (3) and (4)

11 The following are all types of costs associated with management information:

(1) Use of bar coding and scanners
(2) Payroll department's processing of personnel costs
(3) Completion of timesheets by employees
(4) Input of data into the production system

Which of the above are examples of direct data capture costs?

A (1) and (3) only
B (1), (3) and (4)
C (2) and (3)
D (1) and (4) only

12 **Which of the following statements regarding life-cycle costing are correct?**

(1) It can be applied not only to products but also to an organisation's customers
(2) It includes any opportunity costs associated with production
(3) The maturity phase is characterised by a rapid build-up in demand
(4) Often between 70% to 90% of costs are determined early in the product life cycle

A (1), (2) and (4)
B (3) and (4)
C (1) and (4) only
D (2) and (3)

13 A company manufactures a product which requires four hours per unit of machine time. Machine time is a bottleneck resource as there are only ten machines which are available for 12 hours per day, five days per week. The product has a selling price of $130 per unit, direct material costs of $50 per unit, labour costs of $40 per unit and factory overhead costs of $20 per unit. These costs are based on weekly production and sales of 150 units.

What is the throughput accounting ratio?

A 1·33
B 2·00
C 0·75
D 0·31

14 Ox Co has two divisions, A and B. Division A makes a component for air conditioning units which it can only sell to Division B. It has no other outlet for sales.

Current information relating to Division A is as follows:

Marginal cost per unit	$100
Transfer price of the component	$165
Total production and sales of the component each year	2,200 units
Specific fixed costs of Division A per year	$10,000

Cold Co has offered to sell the component to Division B for $140 per unit. If Division B accepts this offer, Division A will be closed.

If Division B accepts Cold Co's offer, what will be the impact on profits per year for the group as a whole?

A Increase of $65,000
B Decrease of $78,000
C Decrease of $88,000
D Increase of $55,000

15 Which of the following statements regarding Fitzgerald and Moon's Building Blocks model are correct?

(1) The determinants of performance are quality, innovation, resource utilisation and competitiveness
(2) Standards are targets for performance and should be fair, achievable and controllable
(3) Rewards encourage staff to work towards the standards and should be clear, motivating and controllable
(4) It is a performance measurement framework particularly suitable for service organisations

A (1), (2) and (3)
B (2) and (3) only
C (3) and (4)
D (1), (2) and (4)

(30 marks)

[P.T.O.

Section B – ALL 15 questions are compulsory and MUST be attempted

Please use the grid provided on page two of the Candidate Answer Booklet to record your answers to each multiple choice question. Do not write out the answers to the MCQs on the lined pages of the answer booklet.

Each question is worth 2 marks.

The following scenario relates to questions 16–20.

Glam Co is a hairdressing salon which provides both 'cuts' and 'treatments' to clients. All cuts and treatments at the salon are carried out by one of the salon's three senior stylists. The salon also has two salon assistants and two junior stylists.

Every client attending the salon is first seen by a salon assistant, who washes their hair; next, by a senior stylist, who cuts or treats their hair depending on which service the client wants; then finally, a junior stylist who dries their hair. The average length of time spent with each member of staff is as follows:

	Cut Hours	Treatment Hours
Assistant	0·1	0·3
Senior stylist	1·0	1·5
Junior stylist	0·6	0·5

The salon is open for eight hours each day for six days per week. It is only closed for two weeks each year. Staff salaries are $40,000 each year for each senior stylist, $28,000 each year for each junior stylist and $12,000 each year for each of the assistants. The cost of cleaning products applied when washing clients' hair is $1·50 per client. The cost of all additional products applied during a 'treatment' is $7·40 per client. Other salon costs (excluding labour and raw materials) amount to $106,400 each year.

Glam Co charges $60 for each cut and $110 for each treatment.

The senior stylists' time has been correctly identified as the bottleneck activity.

16 What is the annual capacity of the bottleneck activity?

	Cuts	Treatments
A	2,400	1,600
B	4,800	4,800
C	7,200	4,800
D	9,600	9,600

17 The salon has calculated the cost per hour to be $42·56.

What is the throughput accounting ratio (TPAR) for both services?

	Cuts	Treatments
A	1·37	1·58
B	1·41	2·38
C	1·37	1·61
D	1·41	2·41

18 Which of the following activities could the salon use to improve the TPAR?

    (1) Apply an increase to the selling price of the services
    (2) Identify ways to reduce the material costs for the services
    (3) Increase the level of inventory to prevent stock-outs
    (4) Increase the productivity of the stage prior to the bottleneck
    (5) Improve the control of the salon's total operating expenses
    (6) Increase the time spent by the bottleneck activity on each service

    A   (1), (2), (5) and (6)
    B   (1), (2) and (5) only
    C   (3) and (4)
    D   (1), (2), (4) and (6)

19 What would be the effect on the bottleneck if the salon employed another senior stylist?

    A   The senior stylists' time will be a bottleneck for cuts only
    B   The senior stylists' time will be a bottleneck for treatments only
    C   The senior stylists' time will remain the bottleneck for both cuts and treatments
    D   There will no longer be a bottleneck

20 Which of the following statements regarding the theory of constraints are correct?

    (1) It focuses on identifying stages of congestion in a process when production arrives more quickly than the next stage can handle
    (2) It is based on the concept that organisations manage three key factors – throughput, operating expenses and inventory
    (3) It uses a sequence of focusing steps to overcome a single bottleneck, at which point the improvement process is complete
    (4) It can be applied to the management of all limiting factors, both internal and external, which can affect an organisation

    A   (1) and (2) only
    B   (1), (2) and (3)
    C   (2), (3) and (4)
    D   (1), (3) and (4)

The following scenario relates to questions 21–25.

Chair Co has several new products in development. Information relating to three of these products is as follows:

Luxury car seat
The estimated labour time for the first unit is 12 hours but a learning curve of 75% is expected to apply for the first eight units produced. The cost of labour is $15 per hour.

The cost of materials and other variable overheads is expected to total $230 per unit. Chair Co plans on pricing the seat by adding a 50% mark-up to the total variable cost per seat, with the labour cost being based on the incremental time taken to produce the 8th unit.

High chair
Another product which Chair Co has in development is a new design of high chair for feeding young children. Based on previous experience of producing similar products, Chair Co had assumed that a learning rate of 85% would apply to the manufacture of this new design but after the first phase of production had been completed, management realised that a learning rate of 80% had been achieved.

Office chair
Chair Co has also developed a new type of office chair and management is trying to formulate a budget for this product. They have decided to match the production level to demand, however, demand for this chair is uncertain.

Management have collected the following information:

	Demand (units)	Probability
Worst possible outcome	10,000	0·3
Most likely outcome	22,000	0·5
Best possible outcome	35,000	0·2

The selling price per unit is $25. The variable cost per unit is $8 for any production level up to 25,000 units. If the production level is higher than 25,000 units, then the variable cost per unit will decrease by 10% and this reduction will apply to all the units produced at that level.

Total fixed costs are estimated to be $75,000.

Chair Co uses cost-plus pricing when setting prices for its products.

21 **In relation to the luxury car seat, what is the labour cost of the 8th unit?**

    A $45·65
    B $75·94
    C $4·32
    D $3·04

22 The first phase of production has now been completed for the new car seat. The first unit actually took 12·5 hours to make and the total time for the first eight units was 34·3 hours, at which point the learning effect came to an end. Chair Co are planning on adjusting the price to reflect the actual time it took to complete the 8th unit.

    What was the actual rate of learning which occurred?

    A   65·7%
    B   58·6%
    C   70·0%
    D   76·5%

23 **In relation to the new design of high chair, which of the following statements could explain why the actual rate of learning differed from the rate which was expected?**

(1) Staffing levels were stable during the first manufacturing phase
(2) There were machine breakdowns during production
(3) Assembly of the chairs was manual and very repetitive
(4) There was high staff turnover during this period
(5) There were minimal stoppages in the production process
(6) The design of the chair was changed several times at this early phase

A   (2), (3) and (4)
B   (1), (3) and (5)
C   (1), (5) and (6)
D   (2), (4) and (6)

24 **Using probabilistic budgeting, what is the expected budgeted contribution of the office chairs?**

A $282,000
B $357,000
C $287,600
D $362,600

25 **Which of the following statements regarding cost-plus pricing strategies are correct?**

(1) Marginal cost-plus pricing is easier where there is a readily identifiable variable cost
(2) Full cost-plus pricing requires the budgeted level of output to be determined at the outset
(3) Cost-plus pricing is a strategically focused approach as it accounts for external factors
(4) Cost-plus pricing requires that the profit mark-up applied by an organisation is fixed

A   (1), (2) and (4)
B   (1) and (2) only
C   (3) and (4)
D   (1) and (3)

The following scenario relates to questions 26–30.

The Hi Life Co (HL Co) makes sofas. It has recently received a request from a customer to provide a one-off order of sofas, in excess of normal budgeted production. The order would need to be completed within two weeks. The following cost estimate has already been prepared:

		Note	$
Direct materials:			
Fabric	200 m^2 at $17 per m^2	1	3,400
Wood	50 m^2 at $8·20 per m^2	2	410
Direct labour:			
Skilled	200 hours at $16 per hour	3	3,200
Semi-skilled	300 hours at $12 per hour	4	3,600
Factory overheads	500 hours at $3 per hour	5	1,500
Total production cost			12,110
General fixed overheads as 10% of total production cost			1,211
Total cost			13,321

Notes:

1   The fabric is regularly used by HL Co. There are currently 300 m^2 in inventory, which cost $17 per m^2. The current purchase price of the fabric is $17·50 per m^2.

2   The wood is regularly used by HL Co and usually costs $8·20 per m^2. However, the company's current supplier's earliest delivery time for the wood is in three weeks' time. An alternative supplier could deliver immediately but they would charge $8·50 per m^2. HL Co already has 500 m^2 in inventory but 480 m^2 of this is needed to complete other existing orders in the next two weeks. The remaining 20 m^2 is not going to be needed until four weeks' time.

3   The skilled labour force is employed under permanent contracts of employment under which they must be paid for 40 hours per week's labour, even if their time is idle due to absence of orders. Their rate of pay is $16 per hour, although any overtime is paid at time and a half. In the next two weeks, there is spare capacity of 150 labour hours.

4   There is no spare capacity for semi-skilled workers. They are currently paid $12 per hour or time and a half for overtime. However, a local agency can provide additional semi-skilled workers for $14 per hour.

5   Of the $3 per hour factory overheads costs, $1·50 per hour reflects the electricity costs of running the cutting machine which will be used to cut the fabric and wood for the sofas. The other $1·50 per hour reflects the cost of the factory supervisor's salary. The supervisor is paid an annual salary and is also paid $15 per hour for any overtime he works. He will need to work 20 hours overtime if this order is accepted.

A quotation now needs to be prepared on a relevant cost basis so that HL Co can offer as competitive a price as possible for the order.

26 **What is the cost of the fabric and the wood which should be included in the quotation?**

	Fabric	Wood
A	$3,500	$419
B	$3,400	$419
C	$3,500	$255
D	$0	$255

27 **What cost should be included in the quotation for skilled labour and semi-skilled labour?**

	Skilled	Semi-skilled
A	$3,600	$4,200
B	$1,200	$4,200
C	$3,600	$5,400
D	$1,200	$5,400

28 What is the cost which should be included in the quotation for factory overheads?

    A $1,050
    B $1,800
    C $750
    D $300

29 Which statement correctly describes the treatment of the general fixed overheads when preparing the quotation?

    A   The overheads should be excluded because they are a sunk cost
    B   The overheads should be excluded because they are not incremental costs
    C   The overheads should be included because they relate to production costs
    D   The overheads should be included because all expenses should be recovered

30 Which of the following statements about relevant costing are true?

    (1) An opportunity cost will always be a relevant cost even if it is a past cost
    (2) Fixed costs are always general in nature and are therefore never relevant
    (3) Committed costs are never considered to be relevant costs
    (4) An opportunity cost represents the cost of the best alternative forgone
    (5) Notional costs are always relevant as they make the estimate more realistic
    (6) Avoidable costs would be saved if an activity did not happen and so are relevant
    (7) Common costs are only relevant if the viability of the whole process is being assessed
    (8) Differential costs in a make or buy decision are not considered to be relevant

    A   (3), (4), (6) and (8)
    B   (1), (2), (5) and (8)
    C   (3), (4), (6) and (7)
    D   (4), (5) and (6)

(30 marks)

[P.T.O.

Section C – Both questions are compulsory and MUST be attempted

Please write your answers to all parts of these questions on the lined pages within the Candidate Answer Booklet.

31 Carad Co is an electronics company which makes two types of television – plasma screen TVs and LCD TVs. It operates within a highly competitive market and is constantly under pressure to reduce prices. Carad Co operates a standard costing system and performs a detailed variance analysis of both products on a monthly basis. Extracts from the management information for the month of November are shown below:

		Note
Total number of units made and sold	1,400	1
Material price variance	$28,000 A	2
Total labour variance	$6,050 A	3

Notes

(1) The budgeted total sales volume for TVs was 1,180 units, consisting of an equal mix of plasma screen TVs and LCD screen TVs. Actual sales volume was 750 plasma TVs and 650 LCD TVs. Standard sales prices are $350 per unit for the plasma TVs and $300 per unit for the LCD TVs. The actual sales prices achieved during November were $330 per unit for plasma TVs and $290 per unit for LCD TVs. The standard contributions for plasma TVs and LCD TVs are $190 and $180 per unit respectively.

(2) The sole reason for this variance was an increase in the purchase price of one of its key components, X. Each plasma TV made and each LCD TV made requires one unit of component X, for which Carad Co's standard cost is $60 per unit. Due to a shortage of components in the market place, the market price for November went up to $85 per unit for X. Carad Co actually paid $80 per unit for it.

(3) Each plasma TV uses 2 standard hours of labour and each LCD TV uses 1·5 standard hours of labour. The standard cost for labour is $14 per hour and this also reflects the actual cost per labour hour for the company's permanent staff in November. However, because of the increase in sales and production volumes in November, the company also had to use additional temporary labour at the higher cost of $18 per hour. The total capacity of Carad's permanent workforce is 2,200 hours production per month, assuming full efficiency. In the month of November, the permanent workforce were wholly efficient, taking exactly 2 hours to complete each plasma TV and exactly 1·5 hours to produce each LCD TV. The total labour variance therefore relates solely to the temporary workers, who took twice as long as the permanent workers to complete their production.

Required:

(a) Calculate the following for the month of November, showing all workings clearly:

    (i) The sales price variance and sales volume contribution variance; (4 marks)

    (ii) The material price planning variance and material price operational variance; (2 marks)

    (iii) The labour rate variance and the labour efficiency variance. (5 marks)

(b) Explain the reasons why Carad Co would be interested in the material price planning variance and the material price operational variance. (9 marks)

(20 marks)

32 Thatcher International Park (TIP) is a theme park and has for many years been a successful business, which has traded profitably. About three years ago the directors decided to capitalise on their success and reduced the expenditure made on new thrill rides, reduced routine maintenance where possible (deciding instead to repair equipment when it broke down) and made a commitment to regularly increase admission prices. Once an admission price is paid customers can use any of the facilities and rides for free.

These steps increased profits considerably, enabling good dividends to be paid to the owners and bonuses to the directors. The last two years of financial results are shown below.

	20X4	20X5
	$	$
Sales	5,250,000	5,320,000
Less expenses:		
Wages	2,500,000	2,200,000
Maintenance – routine	80,000	70,000
Repairs	260,000	320,000
Directors' salaries	150,000	160,000
Directors' bonuses	15,000	18,000
Other costs (including depreciation)	1,200,000	1,180,000
Net profit	1,045,000	1,372,000
Book value of assets at start of year	13,000,000	12,000,000
Dividend paid	500,000	650,000
Number of visitors	150,000	140,000

TIP operates in a country where the average rate of inflation is around 1% per annum.

Required:

(a) Assess the financial performance of TIP using the information given above. (14 marks)

During the early part of 20X4 TIP employed a newly qualified management accountant. He quickly became concerned about the potential performance of TIP and to investigate his concerns, he started to gather data to measure some non-financial measures of success. The data he has gathered is shown below:

Table 1

	20X4	20X5
Hours lost due to breakdown of rides (see note 1)	9,000 hours	32,000 hours
Average waiting time per ride	20 minutes	30 minutes

Note 1: TIP has 50 rides of different types. It is open 360 days of the year for 10 hours each day

Required:

(b) Assess the QUALITY of the service which TIP provides to its customers using Table 1 and any other relevant data and indicate the RISKS it is likely to face if it continues with its current policies. (6 marks)

(20 marks)

Formulae Sheet

Learning curve

$Y = ax^b$

Where Y = cumulative average time per unit to produce x units

a = the time taken for the first unit of output

x = the cumulative number of units produced

b = the index of learning (log LR/log2)

LR = the learning rate as a decimal

Demand curve

$P = a - bQ$

$b = \dfrac{\text{change in price}}{\text{change in quantity}}$

a = price when Q = 0

$MR = a - 2bQ$

End of Question Paper

Answers

Section A

1   B

Set-up costs per production run = $140,000/28 = $5,000
Cost per inspection = $80,000/8 = $10,000
Other overhead costs per labour hour = $96,000/48,000 = $2

Overhead costs of product D:

	$
	$
Set-up costs (15 x $5,000)	75,000
Inspection costs (3 x $10,000)	30,000
Other overheads (40,000 x $2)	80,000
	185,000

Overhead cost per unit = $185,000/4,000 units = $46·25

2   D

Return: $500,000 x 30% = $150,000
Total sales revenue = $550 x 800 = $440,000
Therefore total cost = $440,000 – $150,000 = $290,000
Unit cost = $290,000/800 = $362·50

3   C

The number of units required to make a target profit = (fixed costs + target profit)/contribution per unit of P1.
Fixed costs = ($1·20 x 10,000) + ($1·00 x 12,500) – $2,500 = $22,000
Contribution per unit of P = $3·20 + $1·20 = $4·40
($22,000 + $60,000)/$4·40 = 18,636 units

4   B

Most organisations do collect data about environmental costs but find it difficult to split them out and categorise them effectively.

Life-cycle costing does allow the organisation to collect information about a product's environmental costs throughout its life cycle.

The technique which divides material flows into three categories is material flow cost accounting, not input/output analysis.

ABC does categorise some costs as environment-driven costs, however, these are costs which are normally hidden within total overheads in a conventional costing system. It is environment-related costs which can be allocated directly to a cost centre.

5   D

Mix variance:

Material	AQSM	AQAM	Difference (litres)	Standard cost ($/litre)	Variance ($)
A	800	900	100 A	20	2,000 A
B	1,200	1,100	100 F	25	2,500 F
	2,000	2,000			500 F

Yield variance:

Material	SQSM	AQSM	Difference (litres)	Standard cost ($/litre)	Variance ($)
A	779	800	21 A	20	420 A
B	1,168	1,200	32 A	25	800 A
	(W1) 1,947	2,000			1,220 A

(W1) 1,850 litres of output should use 1,947 litres of input (1,850/0·95)

6   A

An incremental budget builds from the previous year's figures and so any inefficiencies will be carried forward and zero-based budgeting starts from scratch with each item justified for its inclusion in the budget and so should encourage the identification of waste and non-value adding activities, so Statement 1 is correct.

Beyond budgeting attempts to move away from conforming to a rigid annual budget and uses adaptive processes to encourage management to be responsive to current situations which facilitates the use of rolling forecasts, so Statement 2 is correct.

Rolling budgeting are budgets which are continuously updated throughout the year and so forces managers to reassess plans more regularly, whereas activity-based budgeting involves defining the activities which underpin the financial figures and using the activity to allocate resources for the budget, so Statement 3 is incorrect.

Flexible budgets are designed to show the changes in financial figures based on different activity levels and so will recognise different cost behaviour patterns, however, it is activity-based budgeting which ensures that the overall strategy is taken into account because it attempts to manage the business as interrelated parts, not separate activities, so Statement 4 is incorrect.

7   C

EV for major upgrade = (0·80 x $11m) + (0·2 x $7·5m) = $10·3m
EV for minor upgrade = (0·70 x $9m) + (0·3 x $6m) = $8·1m

Decision

Shutdown and sell	$5·75m
Major upgrade (10·3m − 4·5m)	$5·8m
Minor upgrade ($8·1m − $2m)	$6·1m

As the minor upgrade has the highest expected return that should be the option chosen.

8   A

In a single limiting factor situation products should be ranked based on their contribution per unit of limiting factor, which in this case is labour hours.

Product	A	B	C	D
Contribution per unit ($)	46	52	21	60
Number of labour hours required per unit	6	8	3	2
Contribution per labour hour ($)	7·67	6·50	7·00	30·00
Ranking	2nd	4th	3rd	1st

9   D

Target 1 is a financial target and so assesses economy factors. Target 2 is measuring the rate of work handled by staff which is an efficiency measure. Target 3 is assessing output, so is a measure of effectiveness.

10   D

Management information systems do summarise data from TPS into periodic reports for management to use for decision-making.

Transaction processing systems do facilitate the immediate processing of data.

Executive information systems draw data from the MIS and support senior managers to make strategic decisions. They usually have dashboard and interactive graphics so that the big picture can be seen.

Enterprise resource planning systems can have extranet links set up with customers and suppliers.

11   A

Direct data capture costs is a type of data input in which there is no data entry but instead it is captured for a specific purpose. Therefore the use of bar coding and scanners and the completion of timesheets are examples of direct data capture costs.

Time spent by the payroll department processing personnel costs and the input of data into the production system are examples of process costs.

12 C

Customer life-cycle costing can be used by organisations.

It has been reported that the majority of a product's costs are determined early on, i.e. at the design phase.

Life-cycle costing does not include any opportunity costs associated with production.

The growth phase is characterised by a rapid increase in demand.

13 A

Return per factory hour = ($130 – $50)/4 hours = $20
Factory costs per hour = ($20 + $40)/4 = $15
TPAR = $20/$15 = 1·33

14 B

Increase in variable costs per unit from buying in ($140 – $100) =$40
Therefore total increase in variable costs (2,200 units x $40) = $88,000
Less the specific fixed costs saved if A is shut down = ($10,000)
Decrease in profit = $78,000

15 C

The determinants of performance are quality, innovation, resource utilisation and flexibility. Competitiveness is a result of the determinants.

Standards should be fair, achievable and staff should have ownership of them. Controllability is a feature of the rewards block.

Rewards should be clear, motivating and controllable, so this is correct.

It is a framework designed to attempt to overcome the problems associated with performance management in service companies.

Section B

16 C

Total salon hours = (8 x 6 x 50) = 2,400 each year.

There are three senior stylists, therefore total hours available = 7,200.

Based on the time taken for each activity, they can perform 7,200 cuts (7,200 hours/1 hour per cut) or 4,800 treatments (7,200 hours/1·5 hours per treatment).

17 A

Cuts
Return per hour = (Selling price – materials)/time taken on the bottleneck = (60 – 1·50)/1 = 58·50
TPAR = Return per hour/cost per hour = 58·50/42·56 = 1·37 (to two decimal places)

Treatments
Return per hour = (Selling price – materials)/time taken on the bottleneck = (110 – 8·90)/1·5 = 67·40
TPAR = Return per hour/cost per hour = 67·40/42·56 = 1·58 (to two decimal places)

18 B

The factors which are included in the TPAR are selling price, material costs, operating expenses and bottleneck time. Increasing the selling price and reducing costs will improve the TPAR.

Increasing the time which each service takes on the bottleneck (the senior stylists' time) will only reduce the number of services they can provide, so this will not improve throughput.

Throughput accounting does not advocate the building of inventory as it is often used in a just-in-time environment and there is no point increasing the activity prior to the bottleneck as it will just create a build-up of work-in-progress. Neither of these will improve the rate of throughput through the process.

19 B

The existing capacity for each activity is:

	Cut	Treatment
Assistants	48,000	16,000
Senior stylists	7,200	4,800
Junior stylists	8,000	9,600

If another senior stylist is employed, this will mean that their available hours will be (4 x 2,400) = 9,600.

This will give them capacity to now do 9,600 cuts (9,600 hours/1 hour per cut) and 6,400 treatments (9,600 hours/1·5 hours per treatment).

As a result, the senior stylists will still be the bottleneck activity for treatments but for cuts the bottleneck will now be the junior stylists as they can only do 8,000 cuts compared to the senior stylists of 9,600.

20 A

The theory of constraints is focused on identifying restrictions in a process and how to manage that restriction (commonly termed a bottleneck).

It is based on the concept of managing throughput, operating expenses and inventory.

It does use a series of focusing steps but it is not complete once the bottleneck has been overcome. In fact it is an ongoing process of improvement, as once the bottleneck has been elevated it is probable that another bottleneck will appear and the process will continue.

It cannot be applied to all limiting factors as some, particularly those external to the organisation, may be out of the organisation's control.

21 A

Learning curve formula = $y = ax^b$
Cumulative average time per unit for 8 units: $Y = 12 \times 8^{-415} = 5 \cdot 0628948$ hours.
Therefore cumulative total time for 8 units = 40·503158 hours.
Cumulative average time per unit for 7 units: $Y = 12 \times 7^{-415} = 5 \cdot 3513771$ hours.
Therefore cumulative total time for 7 units = 37·45964 hours.
Therefore incremental time for 8th unit = 40·503158 hours – 37·45964 hours = 3·043518 hours.
Total labour cost for 8th unit = 3·043518 x $15 = $45·65277

22 C

Actual learning rate

Cumulative number of seats produced	Cumulative total hours	Cumulative average hours per unit
1	12·5	12·5
2	?	$12 \cdot 5 \times r$
4	?	$12 \cdot 5 \times r^2$
8	34·3	$12 \cdot 5 \times r^3$

Using algebra: $34 \cdot 3 = 8 \times (12 \cdot 5 \times r^3)$
$4 \cdot 2875 = (12 \cdot 5 \times r^3)$
$0 \cdot 343 = r^3$
$r = 0 \cdot 70$

Therefore the learning rate was 70%.

23 B

An 80% learning rate means that the learning was faster than expected.

Factors which are present for a learning curve to take effect are a highly manual and repetitive process (so staff can become quicker the more they perform the same series of tasks), no stoppages to production (so the learning rate will not be lost whilst staff are idle) and a stable workforce (so the learning process does not have to keep restarting).

If there is high staff turnover, stoppages in production and continual design changes, then the learning rate will not be effective and should be slower.

24 D

As the variable cost per unit is changing depending on the production level, contribution for each level needs to be calculated and then the probabilities applied to the outcomes.

Demand (units)	Contribution (per unit)	Total contribution	Probability	Expected budgeted contribution
10,000	17·00	170,000	0·3	51,000
22,000	17·00	374,000	0·5	187,000
35,000	17·80	623,000	0·2	124,600
				362,600

25 B

As marginal costing is based on variable costs, it is easier when a readily identifiable variable cost has been established.

The budgeted volume of output does need to be determined for full cost-plus pricing as it would be used to calculate the overhead absorption rate for the calculation of the full cost per unit.

Cost-plus pricing is internally focused and a drawback of the technique is that it fails to consider external influences, like competitor pricing strategies.

The mark-up percentage does not have to be fixed; it can vary and be adjusted to reflect market conditions.

26 A

Fabric is in regular use, so the replacement cost is the relevant cost (200 m^2 x $17·50) = $3,500.

30 m^2 of wood will have to be ordered in from the alternative supplier but the remaining 20 m^2 which is in inventory and not needed for other work can be used and then replaced by an order from the usual supplier (30 m^2 x $8·50) + (20 m^2 x $8·20) = $419.

27 B

Skilled labour:
There is no cost for the first 150 hours as there is spare capacity. The remaining 50 hours required will be paid at time and a half, which is $16 x 1·5 = $24.
50 hours x $24 = $1,200

Semi-skilled labour:
There is no spare capacity, so the company will either need to pay overtime or hire in additional staff. The cost of paying overtime would be $18 per hour, so it would be cheaper to hire in the additional staff for $14 per hour.
300 hours x $14 = $4,200

28 A

The electricity costs are incremental as the machine will be used more to produce the new order (500 hours x $1·50) = $750.

The supervisor's salary is not relevant as it is paid anyway; however, the overtime is relevant (20 hours x $15) = $300.

29 B

The general fixed overheads should be excluded as they are not incremental, i.e. they are not arising specifically as a result of this order. They are not sunk as they are not past costs. This is a common misconception.

30 C

An opportunity cost does represent the cost of the best alternative forgone, however, if it is an historic (past) cost, it would not be relevant.

Fixed costs can be incremental to a decision and in those circumstances would be relevant.

Committed costs are costs the organisation has already agreed to and can no longer influence and so are not relevant.

Notional costs are used to make cost estimates more realistic; however, they are not real cash flows and are not considered to be relevant.

Avoidable costs are saved if an activity is not undertaken and if this occurs as a result of the decision, then they are relevant.

Common costs are relevant if the whole process is being evaluated; however, they are not relevant to a further processing decision.

Differential costs are relevant in a make or buy decision as the organisation is trying to choose between two options.

Section C

31 (a) (i) Sales price variance and sales volume variance

Sales price variance = (actual price – standard price) x actual volume

	Actual price	Standard price	Difference	Actual volume	Sales price variance
	$	$	$		$
Plasma TVs	330	350	–20	750	15,000 A
LCD TVs	290	300	–10	650	6,500 A
					21,500 A

Sales volume contribution variance = (actual sales volume – budgeted sales volume) x standard margin

	Actual sales volume	Budgeted sales volume	Difference	Standard margin	Sales volume variance
				$	$
Plasma TVs	750	590	160	190	30,400 F
LCD TVs	650	590	60	180	10,800 F
	1,400	1,180			41,200 F

(ii) Material price planning and purchasing operational variances

Material planning variance = (original target price – general market price at time of purchase) x quantity purchased
($60 – $85) x 1,400 = $35,000 A

Material price operational variance = (general market price at time of purchase – actual price paid) x quantity purchased
($85 – $80) x 1,400 = $7,000 F

(iii) Labour rate and labour efficiency variances

Labour rate variance = (standard labour rate per hour – actual labour rate per hour) x actual hours worked
Actual hours worked by temporary workers:
Total hours needed if staff were fully efficient = (750 x 2) + (650 x 1·5) = 2,475.
Permanent staff provide 2,200 hours, therefore excess = 2,475 – 2,200 = 275.
However, temporary workers take twice as long, therefore hours worked = 275 x 2 = 550.
Labour rate variance relates solely to temporary workers, therefore ignore permanent staff in the calculation.
Labour rate variance = ($14 – $18) x 550 = $2,200 A

Labour efficiency variance = (standard labour hours for actual production – actual labour hours worked) x standard rate
(275 – 550) x $14 = $3,850 A

(b) Explanation of planning and operational variances

Before the material price planning and operational variances were calculated, the only information available as regards material purchasing was that there was an adverse material price variance of $28,000. The purchasing department will be assessed on the basis of this variance, yet, on its own, it is not a reliable indicator of the purchasing department's efficiency. The reason it is not a reliable indicator is because market conditions can change, leading to an increase in price, and this change in market conditions is not within the control of the purchasing department.

By analysing the materials price variance further and breaking it down into its two components – planning and operational – the variance actually becomes a more useful assessment tool. The planning variance represents the uncontrollable element and the operational variance represents the controllable element.

The planning variance is really useful for providing feedback on just how skilled management is in estimating future prices. This can be very easy in some businesses and very difficult in others. Giving this detail could help to improve planning and standard setting in the future, as management will be increasingly aware of factors which could create volatility in their forecasts.

The operational variance is more meaningful in that it measures the purchasing department's efficiency given the market conditions which prevailed at the time. As can be seen in Carad, the material price operational variance is favourable which demonstrates that the purchasing department managed to acquire the component which was in short supply at a better price than expected. Without this breakdown in the variance, the purchasing department could have been held accountable for the overall adverse variance which was not indicative of their actual performance. This is then a fairer method of assessing performance and will, in turn, stop staff from becoming demotivated.

32 (a) TIP's financial performance can be assessed in a number of ways:

Sales growth

Sales are up about 1·3% (W1) which is a little above the rate of inflation and therefore a move in the right direction. However, with average admission prices jumping about 8·6% (W2) and numbers of visitors falling, there are clearly problems. Large increases in admission prices reduce the value proposition for the customer, it is unlikely that the rate of increase is sustainable or even justifiable. Indeed with volumes falling (down by 6·7% (W6)), it appears that some customers are being put off and price could be one of the reasons.

Maintenance and repairs

There appears to be a continuing drift away from routine maintenance with management preferring to repair equipment as required. This does not appear to be saving any money as the combined cost of maintenance and repair is higher in 20X5 than in 20X4 (possible risks are dealt with in part (b)).

Directors' pay

Absolute salary levels are up 6·7% (W3), well above the modest inflation rate. It appears that the shareholders are happy with the financial performance of the business and are prepared to reward the directors accordingly. Bonus levels are also well up. It may be that the directors have some form of profit related pay scheme and are being rewarded for the improved profit performance. The directors are likely to be very pleased with the increases to pay.

Wages

Wages are down by 12% (W5). This may partly reflect the loss of customers (down by 6·7% (W6)) if it is assumed that at least part of the wages cost is variable. It could also be that the directors are reducing staff levels beyond the fall in the level of customers to enhance short-term profit and personal bonus. Customer service and indeed safety could be compromised here.

Net profit

Net profit is up a huge 31·3% (W7) and most shareholders would be pleased with that. Net profit is a very traditional measure of performance and most would say this was a sign of good performance.

Return on assets

The profitability can be measured relative to the asset base which is being used to generate it. This is sometimes referred to as ROI or return on investment. The return on assets is up considerably to 11·4% from 8% (W8). This is partly due to the significant rise in profit and partly due to the fall in asset value. We are told that TIP has cut back on new development, so the fall in asset value is probably due to depreciation being charged with little being spent during the year on assets. In this regard it is inevitable that return on assets is up but it is more questionable whether this is a good performance. A theme park (and thrill rides in particular) must be updated to keep customers coming back. The directors of TIP are risking the future of the park.

(b) Quality provision

Reliability of the rides

The hours lost has increased significantly. Equally the percentage of capacity lost due to breakdowns is now approaching 17·8% (W9). This would appear to be a very high number of hours lost. This would surely increase the risk that customers are disappointed being unable to ride. Given the fixed admission price system, this is bound to irritate some customers as they have effectively already paid to ride.

Average queuing time

Queuing will be seen by customers as dead time. They may see some waiting as inevitable and hence acceptable. However, TIP should be careful to maintain waiting times at a minimum. An increase of 10 minutes (or 50%) is likely to be noticeable by customers and is unlikely to enhance the quality of the TIP experience for them. The increase in waiting times is probably due to the high number of hours lost due to breakdown with customers being forced to queue for a fewer number of ride options.

Safety

The clear reduction in maintenance could easily damage the safety record of the park and is an obvious quality issue.

Risks

If TIP continues with current policies, then they will expose themselves to the following risks:

− The lack of routine maintenance could easily lead to an accident or injury to a customer. This could lead to compensation being paid or reputational damage.

− Increased competition. The continuous raising of admission prices increases the likelihood of a new competitor entering the market (although there are significant barriers to entry in this market, e.g. capital cost, land and so on).

− Loss of customers. The value for money which customers see when coming to TIP is clearly reducing (higher prices, less reliability of rides and longer queues). Regardless of the existence of competition, customers could simply choose not to come, substituting another leisure activity instead.

− Profit fall. In the end if customers' numbers fall, then so will profit. The shareholders, although well rewarded at the moment, could suffer a loss of dividend. Directors' job security could then be threatened.

Workings:

(W1) Sales growth is $5,320,000/$5,250,000 = 1·01333 or 1·3%.

(W2) Average admission prices were:

   20X4: $5,250,000/150,000 = $35 per person
   20X5: $5,320,000/140,000 = $38 per person

   An increase of $38/$35 = 1·0857 or 8·57%.

(W3) Directors' pay up by $160,000/$150,000 = 1·0667 or 6·7%.

(W4) Directors' bonuses levels up from $15,000/$150,000 or 10% to $18,000/$160,000 or 12·5% of turnover. This is an increase of 3/15 or 20%.

(W5) Wages are down by (1 − $2,200,000/$2,500,000) or 12%.

(W6) Loss of customers is (1 − 140,000/150,000) or 6·7%.

(W7) Profits up by $1,372,000/$1,045,000 = 1·3129 or 31·3%.

(W8) Return on assets:

   20X4: $1,045,000/$13,000,000 = 1·0803 or 8·03%
   20X5: $1,372,000/$12,000,000 = 1·114 or 11·4%

(W9) Capacity of rides in hours is 360 days x 50 rides x 10 hours per day = 180,000.

   20X4 lost capacity is 9,000/180,000 = 0·05 or 5%.
   20X5 lost capacity is 32,000/180,000 = 0·177 or 17·8%.

Fundamentals Level – Applied Skills, Paper PM
Performance Management

Section A

Each question is worth 2 marks

Section B

Each question is worth 2 marks

Marks

30

30

Section C

Maximum marks   Marks awarded

				Maximum marks
31	**(a)**	**(i)**	Sales price variance – Plasma TVs	1
			Sales price variance – LCD TVs	1
			Sales volume contribution variance – Plasma TVs	1
			Sales volume contribution variance – LCD TVs	1
				4
		(ii)	Material price planning variance	1
			Material price operational variance	1
				2
		(iii)	Actual hours worked	3
			Labour rate variance	1
			Labour efficiency variance	1
				5
	(b)		Controllability	2
			Material price planning	3
			Material price operating	3
			Other valid point – planning or operating	1
				9
				20

			Maximum marks
32	**(a)**	Sales growth	3
		Maintenance	3
		Directors' pay	2
		Wages	2
		Net profit	2
		Return on assets	2
			14
	(b)	Reliability of rides	2
		Average queuing time	2
		Risks	2
			6
			20