

Specimen Exam 1

Exam Name: Performance with Data Analysis (E5)

Time Allowed: 3 hours

Pass Mark: 50%

This exam contains 3 sections:

Section A:

15 questions, each worth 2 marks

30 marks in total

Section B:

3 questions, each worth 10 marks

30 marks in total

Section C:

2 questions, each worth 20 marks

40 marks in total

Section A

Question 1

Which of the following situations is/are consistent with the principle of controllability in performance management?

- (1) Revenue centre managers should be held accountable for the total profit generated in their division
- (2) Divisional managers should only be held accountable for results which they can significantly influence
- (3) A production manager should be evaluated on the cost of the materials used in production, which were ordered by a company-wide purchasing team

- A 1 and 2
B 2 only
C 3 only
D 1 and 3

Question 2

Nook Co produces and sells a floor mat made from recycled rubber. It currently sells 4,000 mats per year at a price of \$25 per mat. Market research shows that an increase in price of \$2 would decrease annual sales by 400 mats.

Calculate the marginal revenue at an output level of 3,000 mats (to the nearest \$).

\$

Question 3

Return on investment (ROI) and residual income (RI) are commonly used divisional performance measures.

Select whether each of the following statements about the advantages and disadvantages of the performance measures apply to ROI only, RI only or both.

		ROI only	RI only	Both
1.	Always increases when new investments earn returns greater than the cost of capital			
2.	Can conflict with net present value (NPV) indicators in the short term			
3.	Facilitates the comparison of managerial performance in divisions of different sizes			

Question 4

Joriz Co, a dairy plant, processes raw milk. The milk-separation process makes two joint products: cream and skimmed milk.

At the split-off point, 10,000 litres of cream and 9,000 litres of skimmed milk are produced, with selling prices of \$1.20 per litre for cream and \$1.50 per litre for skimmed milk.

The litres of cream could be processed further to make 8,000 units of butter. The extra costs incurred in this process would be fixed costs of \$1,600 and variable costs of \$0.50 per litre of input.

The selling price of butter would be \$2.25 per unit.

What would be the outcome if the cream is further processed?

- A \$600 loss
- B \$400 gain
- C \$3,900 gain
- D \$1,600 loss

Question 5

Pyram Co has updated its corporate vision and now wants to know how it can achieve this vision.

Move the stages in the performance hierarchy into the correct order with the first stage at the top and the last stage at the bottom.

Item	Response area
Budgets	<div style="display: flex; align-items: center; justify-content: center;"> ⇔ <div style="border: 1px solid black; width: 300px; height: 150px; display: flex; align-items: center; justify-content: center;"> ↑ ↓ </div> </div>
Mission	
Variances	
Objectives	

Question 6

Tarmalot Co’s actual production figures for a batch of products are as follows:

	Kg	\$
Material	5,000	25,000
Labour and overhead		65,000
	5,000	90,000
Normal loss 15%	(750)	
	4,250	90,000
Abnormal loss	(250)	(4,000)
Good output	4,000	86,000

Select the environmental cost category which Tarmalot Co would allocate its normal loss and abnormal loss to.

		Conventional costs	Contingent costs	Potentially hidden costs
1.	Normal loss			
2.	Abnormal loss			

Question 7

Which of the following statements about forecasting based on simple linear regression is true?

- A Cost forecasts using extrapolation are more accurate than those using interpolation
- B It can account for the effect of multiple independent variables
- C It assumes that historical data is a reliable guide to the future
- D It is not suitable when the variables show strong negative correlation

Question 8

Select whether each of the following statements about the theory of constraints is true or false.

		True	False
1.	There should be a small amount of buffer inventory held prior to the bottleneck		
2.	Operations prior to the bottleneck should operate at a faster level than the bottleneck		
3.	Conversion costs and investment costs are kept to a minimum		

Question 9

Move the target costing stages into the correct order with the first stage at the top and the final stage at the bottom.

Item	Response area
Cost the product	
Identify the cost gap	
Use functional and value analysis	
Determine the profit margin	
Set the selling price	
Develop the product concept	

Question 10

Select whether each of the following statements relate to leading or lagging performance indicators.

		Leading indicators	Lagging indicators
1.	Non-financial indicators which measure areas such as process efficiency and staff training		
2.	Financial indicators which measure areas such as profit, return on investment (ROI) and market share		
3.	Indicators which are usually considered to be the drivers of future financial performance		
4.	A focus on these indicators should avoid short-termism in decision making		

Question 11

Claude Co makes protective laptop bags. To meet demand of 5,000 units it has budgeted to use the following resources per laptop bag:

Material A	1.1 kg at \$3.00 per kg
Material B	0.5 kg at \$2.50 per kg
Labour	0.5 hours at \$12 per hour

Variable overheads are allocated at a rate of \$2 per kg of material B used.

Fixed overheads are \$10,000 and are absorbed based on the quantity of material A used.

What is the standard full cost per laptop bag (to two decimal places)?

\$

Question 12

Lusk Co has three divisions. The divisions operate as investment centres, and at the beginning of each year the divisional managers decide which investments their divisions should undertake for that year. It is the beginning of the year, and the managers have been offered a range of projects.

Match the statements made by the divisional managers to the decision-making technique which is the MOST appropriate for their risk appetite.

Statement	Decision-making technique
Division A manager is an optimist who expects the best return for any project undertaken	Expected value
Division B manager is concerned about making the wrong decision and accepting the wrong projects	Maximax
Division C manager is less concerned about the risk of the project and more concerned about the most likely outcome	Minimax regret

Question 13

Which TWO of the following statements about Kaplan and Norton’s Balanced Scorecard (BSC) are true?

- A It includes internal and external performance measures
- B It offers a long-term perspective of performance
- C It focuses on the needs of all stakeholders
- D It is especially suited to service businesses

Question 14

Which of the following statements concerning the assumptions of cost-volume-profit (CVP) analysis is true?

- A Total fixed costs will reduce as volume increases
- B To increase demand the selling price per unit must be reduced
- C Contribution per unit is constant with respect to volume
- D It is best suited as a long-term planning tool

Question 15

Stadh Co manufactures automotive brake pads which consist of a mix of three materials, steel, resin and fibre. The standard material cost of one brake pad is as follows:

		\$
Steel	0.5 kg at \$2 per kg	1.00
Resin	0.2 kg at \$6 per kg	1.20
Fibre	0.1 kg at \$10 per kg	1.00

During March, 3,000 brake pads were produced, and actual usage was:

Steel	1,320 kg
Resin	650 kg
Fibre	310 kg

Calculate the favourable materials yield variance for March (to the nearest \$).

\$

Section B

The following scenario relates to questions 16 to 20.

Phonacc Co (Phonacc) is a manufacturer of accessories for mobile phones. It has recently opened a new factory to meet the increasing demand for earbuds (in-ear headphones), headphones and wireless chargers and is planning its production mix to optimise the use of this new factory

The following standard cost card data and the monthly demand for the three products is available:

	Earbuds	Headphones	Wireless Chargers
	\$	\$	\$
Selling price per unit	50	75	65
Material: casings (\$5 per kg)	10	20	15
Material: components (\$2.20 per kg)	6.6	11	8.8
Direct labour (\$18 per hour)	5.4	9	4.5
Variable overheads	1.8	3	1.5
Fixed overheads	12	20	10
Profit per unit	14.2	12	25.2
Monthly demand (units)	400	250	560

Note: Fixed overheads are calculated based on the expected monthly demand for the products.

In the first month the supply of casings was restricted to 3,100 kg and the supply of components was restricted to 5,000 kg. This was due to a global shortage. The direct labour involved in production was limited to 360 hours.

The management accountant defined the following variables to formulate the linear programming problem:

- E = number of earbuds produced in a month
- H = number of headphones produced in a month
- W = number of wireless chargers produced in a month

A simplex linear programming package was used to calculate an optimal production plan to enable Phonacc to maximise its profits in the month. The output generated from the package is as follows:

Simplex output			
	Value		
Objective function	35,152		
Earbuds	400		
Headphones	155		
Wireless chargers	560		
	Value	Slack	Shadow price
Material: casings (kg)	3,100	0	8.00
Material: components (kg)	4,215	785	0
Direct labour (hours)	337.5	22.5	0
Earbuds	400	0	
Headphones	155	95	
Wireless chargers	560	0	

Question 16

What is the correct formula for the objective function required for input into the simplex linear programming package?

- A 50E + 75H + 65W
- B 26.2E + 32H + 35.2W
- C 14.2E + 12H + 25.2W
- D 28E + 35H + 36.7W

Question 17

Select the correct option from each drop-down list to complete the sentence.

To formulate the input into a simplex linear programming package the components

constraint is represented by

Select... ▼
$6.6E + 11H + 8.8W \leq 5,000$
$3E + 5H + 4W \leq 5,000$
$2E + 4H + 3W \leq 3,100$

and

Select... ▼
$W \leq 560$
$560 \leq W$
$W = 560$

represents the demand for wireless chargers.

Question 18

Calculate, from the linear programming output provided, the maximum profit which Phonacc will achieve in the month from the optimal production plan (to the nearest \$).

\$

Question 19

Select whether each of the following statements regarding the simplex output are correct or incorrect.

		Correct	Incorrect
1.	If one additional kg of casing was obtained the total contribution of Phonacc would increase by \$8.00		
2.	All of the available direct labour time has been used		
3.	There will be no unsatisfied demand for wireless chargers		

Question 20

The following statements have been made in relation to the use of simplex linear programming to resolve limiting factor problems:

- (1) The simplex linear programming method helps to identify the optimum selling price for a product
- (2) Simplex linear programming cannot be used in a situation where an organisation is facing a single limited resource

Which of the above statements about the use of simplex linear programming to resolve limiting factor problems is/are true?

- A 1 only
- B 2 only
- C Both 1 and 2
- D Neither 1 nor 2

The following scenario relates to questions 21 to 25.

Blux Co (Blux) is a manufacturing company which produces two types of games console controllers: gamepads and joysticks. It sells to retailers for onward sale to the final users. Blux implemented activity-based costing (ABC) a few years ago and is keen to take this one step further and begin using activity-based budgeting (ABB) as well.

Blux has been facing increasing price pressure to remain competitive against low-cost imported goods and is looking to set new prices for the next year, 20X7, based on its budgeted costs.

20X6 information

Details of some of the cost driver rates for overheads from 20X6 are as follows:

	Notes	\$
Cost per machine set-up	1	80
Cost per quality control inspection	2	260

Notes:

1. Batch sizes are 200 for gamepads and 450 for joysticks. Every time a batch is complete, the machine used for manufacturing them needs to be set up again for the next batch.
2. Quality control inspections take place on every 50th controller.

Blux incurs delivery costs for every order placed. The average order/delivery size is 100 of either type of controller. Delivery costs are a semi-variable cost, with a variable element which relates to the fuel and a fixed element which relates to the delivery vehicles. The following information relates to delivery costs incurred in two quarters of 20X6:

	Quarter 1	Quarter 2
Number of deliveries	325	200
Total annual delivery costs	\$75,950	\$67,200

20X7 information

Blux's inventory policy is to hold enough inventory of controllers to meet the next month's sales demand. The forecast sales are higher in total than 20X6 and are expected to be the same quantity each month.

Salary increases for quality control staff will result in a 7.5% increase in the cost per quality control inspection compared to 20X6. Delivery costs and machine set-up costs will remain unchanged.

Question 21

Blux has forecast sales for gamepads in the first three months of 20X7 (quarter 1) to be 15,000 units, with an opening inventory level of 3,600 units.

What is the total cost of machine set-ups which would be budgeted for gamepads in 20X7 quarter 1?

- A \$4,560
- B \$2,916
- C \$6,000
- D \$6,560

Question 22

In quarter 2 of 20X7 18,000 joysticks will be produced.

Calculate the budgeted quality control inspection cost per unit for the joystick in quarter 2 (to two decimal places).

\$

Question 23

For quarter 2 20X7, it has been agreed that there will be no inventory movement for joysticks, and so 18,000 joysticks will be produced and sold.

What is the total budgeted variable delivery cost for joysticks for this quarter?

- A \$12,600
- B \$60,480
- C \$25,200
- D \$42,068

Question 24

The batch size for joysticks is currently 450 units. A design change will require joysticks to be made in batches of 300 units in future.

Assuming that the cost driver rate for machine set-ups remains unchanged from 20X6, select the correct option from each drop-down list to complete the statement below.

The change in batch size for 20X7 will cause the number of machine set-ups to

Select... ▼
rise
remain unchanged
fall

which will mean that the budgeted cost of one joystick will

Select... ▼
increase
remain unchanged
decrease

if all other costs remain unchanged.

Question 25

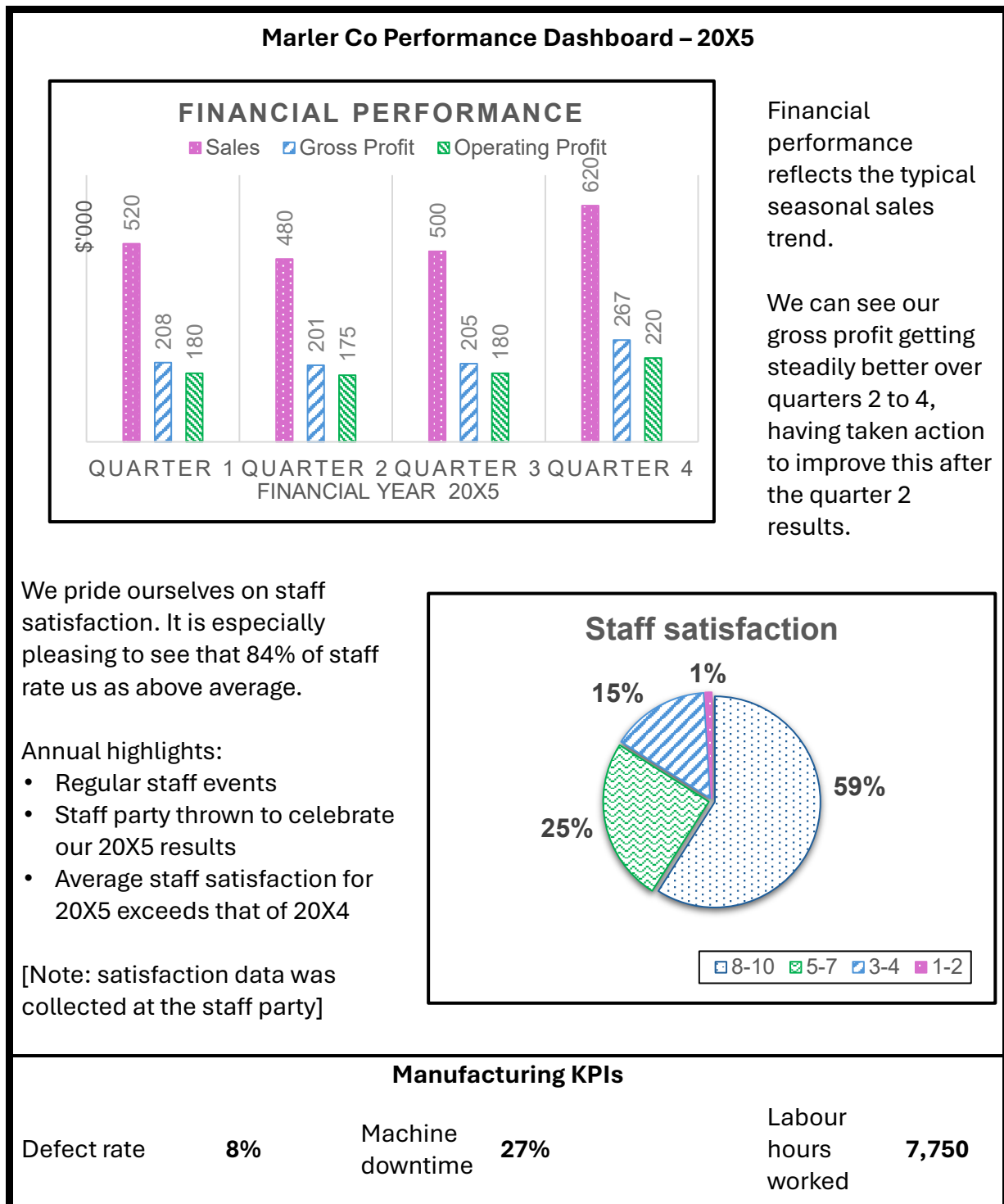
Select whether each of the following statements regarding the implementation of activity-based budgeting (ABB) is correct or incorrect.

		Correct	Incorrect
1.	It will improve accuracy in the budgeting for overhead costs compared to an incremental budgeting approach		
2.	It is beneficial in an organisation which has a limited range of products with similar production methods		
3.	It will require detailed analysis of overheads and activities which will be expensive to implement		

The following scenario relates to questions 26 to 30.

Marler Co (Marler) is a manufacturing company, making and selling robotic production technology to other manufacturing organisations. It has started to use a performance dashboard for internal use, to assist with management control and decision making. This dashboard contains a number of financial performance indicators (FPIs) and other key performance indicators (KPIs).

The first dashboard to be produced, at the end of 20X5, is shown below:



Question 26

Calculate the operating profit margin for the financial year 20X5 (to 2 decimal places).

%

Question 27

Select whether each of the following is a challenge which would have been faced when collecting and displaying the staff satisfaction results for Marler for 20X5.

		Challenge	Not a challenge
1.	Staff morale was difficult to measure due to its subjective nature		
2.	There were too many respondents, hence making it difficult to interpret the data		
3.	The data was unreliable due to the collection process employed		

Question 28

Additional production data for Marler from 20X5 is provided:

Product	Production units	Standard labour hrs per unit
XRT750	500	5
SRT500	900	4
BRT250	300	3

Calculate, with reference to the production data and the information in the performance dashboard, the labour efficiency ratio for Marler (to 2 decimal places).

%

Question 29

Select whether each of the following statements regarding Marler’s 20X5 performance is true or false.

		True	False
1.	Gross profit margin is increasing from quarter 2 to quarter 4		
2.	The reported defect rate is likely to be a direct result of machine downtime		
3.	If the manufacturing key performance indicators improved, it is likely that the financial performance indicators would also improve		

Question 30

Which of the following statements relating to performance indicators is/are correct?

- (1) A long-term view of organisational performance will be obtained from using only financial performance indicators
- (2) The use of financial performance indicators can provide a holistic view of performance
- (3) Optimal business decisions are likely to be made with the inclusion of non-financial performance indicators, alongside financial performance indicators

- A 1 and 2
- B 2 and 3
- C 1 only
- D 3 only

Section C

Question 31

The following scenario relates to three requirements.

Ecoclothing Co (EC) is a sustainable fashion brand, based in Geeland, which focuses on designing and selling environmentally friendly clothing products. It does not manufacture its own designs but outsources this to a growing number of clothing manufacturers, all of which are known for their commitment to sustainability practices.

Many of its suppliers have installed smart technology to reduce energy usage and EC is now considering undertaking a project to do the same within its central headquarters and warehouses.

An extract from the initial project documentation is as follows:

Project Approval Document – Smart technology energy saving project

Project description: The design, purchase and installation of smart technologies aimed at reducing energy usage for heating and lighting across all Ecoclothing Co (EC) premises in Geeland.

Project benefits: “Reputation enhancement due to extension of our sustainability credibility and a reduced carbon footprint”. The environmental benefits have been estimated as a reduction in energy consumption of 60,000 kilowatt hours (kWh) per year.

Project duration: The project will run from 1 January 20X2 until 30 June 20X8. It will take place over two phases, with the first phase lasting 18 months, and the second phase lasting five years.

Project details:

- **Phase 1** – Investigation and design, sourcing of suppliers, equipment purchase and installation.
- **Phase 2** – All technologies in place and operating at capacity. Benefits are expected to occur from the beginning of this phase.

The detailed costs and benefits relating to the project are as follows:

1. Phase 1 will require the recruitment of a consultant at a one-off fee of \$20,000 to assess the needs of EC and to finalise the design of the network of smart technology required.
2. EC will hire a temporary member of staff to provide administrative support from Phase 1, through to the end of the first year of Phase 2. Their salary is expected to be \$12,000 per year.

3. EC's procurement manager will carry out the work for the first six months of Phase 1 relating to the sourcing of suppliers. It is expected to take approximately 10% of his time. His annual salary is \$52,000.
4. Although the investigation and design work is not yet complete, from speaking with its manufacturers, EC has forecast that the average cost of the equipment is expected to be \$75,000 with installation costs being a further 10% of that. The equipment purchase and installation will occur at the end of Phase 1.
5. Maintenance costs of 3% of equipment purchase costs are expected at the end of each 12-month period in Phase 2, with the exception of the final 12 months.
6. Costs of \$10,000 will be incurred in marketing the initiative at the beginning of Phase 2 in order to further enhance the sustainability brand of EC.
7. At the end of the project, it is expected that the equipment will not be fully recyclable, but rather than create waste it will be donated to charitable organisations. The cost of de-installation and transport is expected to be \$6,000.
8. 1 kWh is estimated to cost \$0.50 in 20X3 and will increase by 5% a year, with the increase taking place on 1 January in each year.

Requirements:

(a) Calculate the life-cycle cost and profit of the smart technology energy saving project.

(9 marks)

(b) Recommend, with reasons, whether the project should be undertaken.

(3 marks)

(c) Assess the challenges for EC in both the data collection and cost predictions for the life-cycle costing approach used for the project.

(8 marks)

(20 marks)

Question 32

The following scenario relates to three requirements.

HoGan Bags Co (HGB) is a manufacturer of high-quality bags. Its manufacturing process involves the use of automated production technology to create the bags, which are then finished using skilled labour. HGB has a very low staff turnover and most production staff have now been with the company for at least five years.

In recent months profit has been significantly lower than budgeted. Fixed costs have been exactly as budgeted, so the management team is concentrating on any elements which affect contribution.

The standard cost card for one bag is as follows:

	Input quantity	Cost per input unit
Leather	0.75 metres	\$8.60 per metre
Rubber	0.2 metres	\$6.20 per metre
Labour	3.5 hours	\$16 per hour
Variable overhead	3.5 hours	\$4.30 per hour

The following operating statement for quarter 1 20X5 has been produced. HGB uses marginal costing.

HGB Operating Statement			
Variations for quarter 1			
			\$000
Budgeted contribution			603,120
Sales variances:			
Price			256,000 Adverse
Volume			40,208 Favourable
Variable cost variances:			
		Favourable	Adverse
		\$000	\$000
Leather	Price	12,672	
	Usage		16,512
Rubber	Price		768
	Usage		7,936
Labour	Rate		163,840
	Efficiency	61,440	
Variable overhead	Rate	8,192	
	Efficiency	16,512	90,240 Adverse
Actual contribution			297,088

The following notes have been provided for quarter 1 20X5:

1. Expected production and sales were 12,000 bags
2. The budgeted selling price was \$129 per bag
3. The actual number of labour hours was 40,960 hours
4. HGB produced and sold the same volume of bags in the quarter

During a meeting about the operating statement, the following points were made:

- The marketing manager stated that she believed variance analysis to be an outdated form of performance measurement, as it did not consider any non-financial factors such as sustainability, which is increasingly important to customers and is one of HGB's critical success factors.
- She also stated concern that the report failed to take into consideration elements such as market share, as variances in sales volume did not indicate whether market share was growing or declining.
- The production manager agreed and stated that one concern of his was that variances did not take quality into consideration.

Requirements:

(a) Calculate the following for quarter 1:

- (i) Actual sales volume (bags)**
- (ii) Actual usage of leather (metres per bag)**
- (iii) Actual labour rate (\$ per hour)**
- (iv) Actual total variable overhead expenditure (\$)**

(8 marks)

(b) Analyse the performance of HGB for quarter 1, using the operating statement and the additional calculations performed in part (a).

(7 marks)

(c) Assess the validity of the marketing and production managers' views about the use of variance analysis in assessing the performance of HGB.

(5 marks)

(20 marks)