KASNEB REVISION KIT

QUANTITATIVE ANALYSIS REVISION KIT

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CPA
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FOUNDATION LEVEL

QUANTITATIVE ANALYSIS
REVISION KIT

TOPICALLY ARRANGED

Updated With
August 2025
Past Paper with Answers

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PART A:

PAST PAPERS QUESTIONS

TOPIC 7

DECISION THEORY

QUESTION 1

August 2025 Question Six B

Jumbo Ltd. has to make a decision on whether to invest in project A, B or C. The economic conditions could be favourable, moderate or unfavourable.

The table below shows the potential payoffs in thousands of shillings (Sh."000") depending on the market conditions and their associated probabilities:

	Economic conditions		
Project	**Favourable**	**Moderate**	**Unfavourable**
A	7,300	5,600	4,100
B	15,100	6,700	0
C	9,500	6,000	2,500
Probability	0.20	0.30	0.50

Required:

Advise the management of Jumbo Ltd. of the most optimal decision using:

(i) Maximax criterion. (3 marks)

(ii) Maximin criterion. (3 marks)

(iii) Laplace criterion. (4 marks)

(iv) Expected monetary value (EMV) criterion. (4 marks)

QUESTION 2

April 2025 Question One A

Discuss **THREE** emerging issues in quantitative analysis that have significantly impacted decision making in modern industries. (6 marks)

QUESTION 3

April 2025 Question Five B

Pegra Ltd. is considering launching a new electric product. However, demand for the proposed product is uncertain and the company can either launch the new product immediately or conduct market research before making a decision which could return either a favourable or unfavourable outcome. If the research outcome is favourable, Pegra Ltd. can proceed with launch. If the research outcome is unfavourable, the company has the option to abandon the launch.

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Probabilities and payoffs:

Option 1: Launch immediately:

- Probability of high demand will be 60% with a projected profit of Sh.500,000
- Probability of low demand will be 40% with a projected loss of Sh.200,000

Option 2: Conduct market research at a cost of Sh.50,000

- Probability of favourable research outcome is 70%
- Probability of unfavourable research outcome is 30%

If research outcome is favourable:

- Probability of high demand will be 80% with a projected profit of Sh.500,000
- Probability of low demand will be 20% with a projected loss of Sh.200,000

If research outcome is unfavourable:

- The company can choose to abandon the launch incurring only the Sh.50,000 research cost.

Required:

(i) Construct a decision tree based on the given probabilities and outcomes. (8 marks)

(ii) Compute the expected monetary value (EMV) for each option. (4 marks)

(iii) Recommend the best investment decision for the company. (2 marks)

QUESTION 4

December 2024 Question Four B

Faida Ltd. is in the process of reviewing the selling price for product "Excel". The selling prices under consideration are Sh.50, Sh.55 and Sh.60.

The following additional information is provided about the forecasted demand for product "Excel" under three different market conditions:

Market condition (Demand in Units)

Selling price	Good	Moderate	Bad
Sh.50	20,000	18,000	14,000
Sh.55	18,000	16,500	12,000
Sh.60	16,000	14,000	8,500

The fixed costs are estimated at Sh.300,000 and variable cost per unit is Sh.30.

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PART B:

SUGGESTED ANSWERS AND SOLUTIONS

TOPIC 7

DECISION THEORY

QUESTION 1

August 2025 Question Six B

Jumbo Ltd.

(i) **Maximax criterion.**

Project	**Max payoff (Sh. 000)**	
A	7300	
B	15100	Max
C	9500	

Hence, the management of the company should select project B

(ii) **Maximin criterion.**

Project	**Min payoff (Sh. 000)**	
A	4100	Max
B	0	
C	2500	

The management should select project A

(iii) **Laplace criterion.**

Project	Average payoff (Sh. 000)	
A	$\frac{1}{3}(7300 + 5600 + 4100)$	= 5,667
B	$\frac{1}{3}(15100 + 6700 + 0)$	= 7267 max
C	$\frac{1}{3}(9500 + 6000 + 2500)$	= 6000

The management should select project B

(iv) **Expected monetary value (EMV) criterion.**

Project	**EMV (Sh. 000)**	
A	$0.20\ (7300) + 0.30(5600) + 0.50(4100) = 5190$	Max
B	0.20(15100) + 0.30 (6700) + 0.50(0) = 5030	
C	0.20(9500) + 0.30(6000) + 0.50(2500) = 4950	

The management should select project A

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QUESTION 2

April 2025 Question One A

Emerging issues in quantitative analysis that have significantly impacted decision making in modern industries.

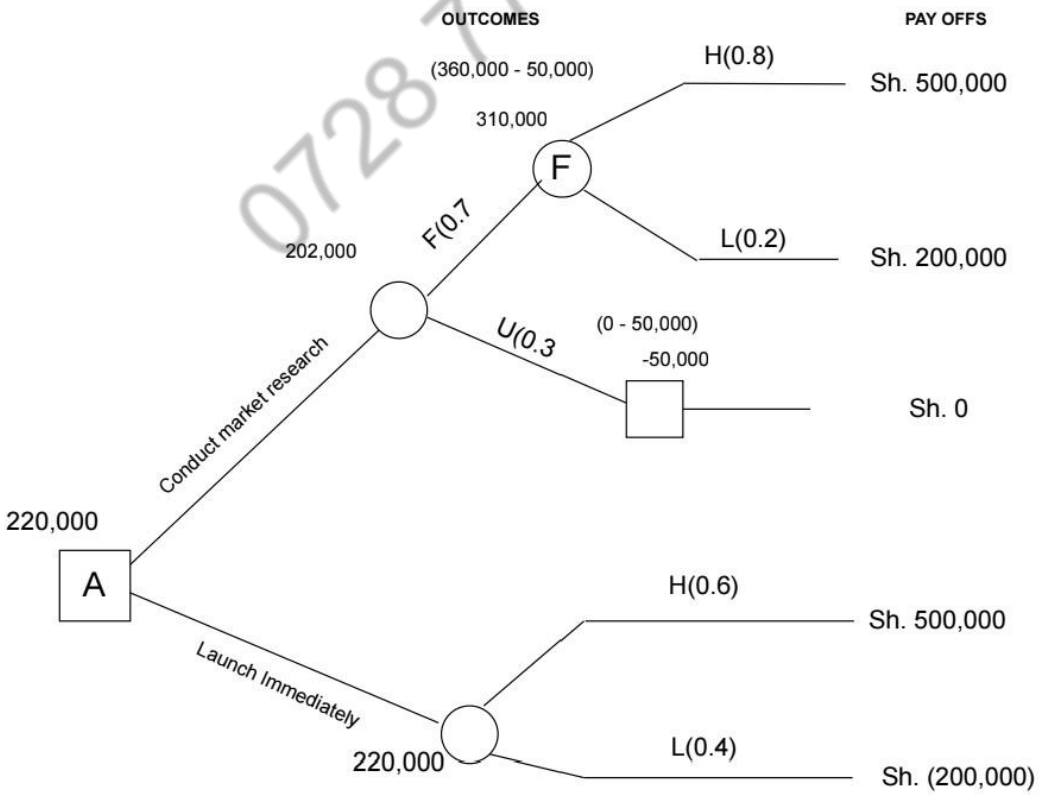
- **Artificial intelligence:** Advancement in technologies has led to the introduction of AI which is used to analyse vast data to make predictions for future planning and decision making
- **Data analytics:** Quantitative analysis has also utilized data analytic tools to identify data patterns, predict outcomes and also optimize decision making activities of managers.
- **Big data:** As a result of massive increase in big data, there has been need for new quantitative analysis techniques to analyse the big data so as to discover meaningful insights to enhance decision making processes in organizations.

QUESTION 3

April 2025 Question Five B

Pegra Ltd.

(i) **Constructing a decision tree based on the given probabilities and outcomes.**



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Where:

F = Favourable outcome of market research

U = Unfavourable outcome of market research

H = High demand

L = Low demand

(ii) **Computing the expected monetary value (EMV) for each option.**

Option	**EMV** Sh.
1. $0.7[0.8(500{,}000) + 0.2(-200{,}000)] + 0.3(0) - 50{,}000$	202,000
2. $(0.6 \times 500{,}000) + 0.4\ (-\ 200{,}000)$	220,000

(iii) **Recommending the best investment decision for the company.**

The company should consider option 1 i.e launching the new electric product immediately resulting in a higher EMV of Ksh. 220,000

QUESTION 4

December 2024 Question Four B

Faida Ltd.

(i) **The pay-off trade for product "Excel".**

Basic workings (w)

Profit (pay – off) = (SP – VC) Q – Fixed cost

Where:

SP = Selling price

VC = Variable cost per unit

Q = Demand in units

Selling price Sh. 50	
Market condition	**Pay off "sh.000"**
Good	(50 – 30) 20,000 – 300,000 = 100,000
Moderate	(50 – 30) 18000 – 300,000 = 60,000
Bad	(50 – 30) 14000 – 300,000 = - 20,000

Selling price Sh. 55	
Market condition	**Pay off "sh.000"**
Good	(55 – 30) 18,000 – 300,000 = 150,000
Moderate	(55 – 30) 16,500 – 300,000 = 112,500
Bad	(55 – 30) 12000 – 300,000 = 0

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Selling price Sh. 60	
Market condition	**Pay off "sh.000"**
Good	(60 – 30) 16,000 – 300,000 = 180,000
Moderate	(60 – 30) 14000 – 300,000 = 120,000
Bad	(60 – 30) 8500 – 300,000 = - 45,000

Pay – off Table

	Market condition (Profit in shillings)		
Selling price	**Good**	**Moderate**	**Bad**
Sh. 50	100,000	60,000	- 20,000
Sh. 55	150,000	112,500	0
Sh. 60	180,000	120,000	-45,000

(ii) **Advise to Faida Ltd. on the best selling price for product "Excel" based on maximax criterion.**

Selling price	Maximum Pay – off (Profit) Sh.
Sh. 50	100,000
Sh. 55	150,000
Sh. 60	180,000 (maximum)

Hence, the best selling price for Faida Ltd. is sh. 60 per unit resulting in the maximum profit of sh. 180,000

(iii) **Advise Faida Ltd. on the best selling price for product "Excel" based on maximin criterion.**

Selling price	Minimum Pay – off (Profit) Sh.
Sh. 50	- 20,000
Sh. 55	0 (Maximum)
Sh. 60	- 45,000

Hence, Faida Ltd. should sell its product "Excel" at a price of sh. 55 per unit under this criterion

(iv) **The best selling price for product "Excel" based on expected monetary value (EMV) criterion**

Selling price	EMV Sh.
Sh. 50	0.30(100,000) + 0.50(60,000) + 0.20(-20,000) = 56,000

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