

UNIVERSITY OF ESWATINI

FACULTY OF COMMERCE

DEPARTMENT OF BUSINESS ADMINISTRATION

FINAL EXAMINATION PAPER; B.COM/IDE

NOVEMBER 2019

TITLE OF PAPER : MANAGEMENT SCIENCE 1

COURSE CODE : BA302

TIME ALLOCATED : THREE [3] HOURS

TOTAL MARKS : 100 MARKS

INSTRUCTIONS

1. TOTAL NUMBER OF QUESTIONS IN THIS PAPER IS 5
2. ANSWER FOUR [4] QUESTIONS OF YOUR CHOICE.
3. THE MARKS ALLOCATED FOR A QUESTION/PART OF A QUESTION ARE INDICATED AT THE END OF EACH QUESTION/PART OF QUESTION.
4. YOU MUST CLEARLY SHOW ALL YOUR WORKINGS IN YOUR ANSWER BOOKLET

THIS PAPER MUST NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

QUESTION 1.

- a. What are the assumptions of Linear programming techniques **(5 marks)**
- b. Assuming an objective function of $2x_1+3x_2$, use the corner point method to solve the following minimization Linear Programming problem **(20 marks)**

$$5x_1 + 10x_2 \geq 90$$

$$4x_1 + 3x_2 \geq 48$$

$$1/2x_1 \geq 11/2$$

$$x_1 \geq 0$$

$$x_2 \geq 0$$

[Total 25 Marks]

QUESTION 2.

Study the following table carefully and answer questions after it

Year	1	2	3	4	5	6	7	8	9	10
Sales	110	100	120	140	170	150	160	190	200	190

Based on the mean absolute deviation (MAD) which one is a better forecasting method, the three period moving average and the exponential smoothing forecasting technique. In your calculations assume that the forecast figure for period one was 100 and the applicable exponential smoothing factor is 0.3 **[Total 25 Marks]**

QUESTION 3.

Explain the various qualitative forecasting methods that management can use in conjunction with quantitative techniques [15 marks]

Explain how you can utilise Statistical quality control in a bakery enterprise [10 marks]

[Total 25 Marks]

QUESTION 4.

You are considering investing some money that you inherited. The following pay off table gives you the profits that would be realised during the next year for each of the three investment alternatives you are considering.

ALTERNATIVES	STATE OF NATURE		
	GOOD ECONOMY	FAIR ECONOMY	POOR ECONOMY
Stock Market	E80,000.00	E0	- E20,000.00
Bonds	E30,000.00	E20,000.00	E12,000.00
Certificate of Deposit	E23,000.00	E10,000.00	E8,000.00
Probability	0.3	0.4	0.3

- What is a decision alternative? (2 marks)
- What is a state of nature? (2 marks)
- What decision would maximize the expected monetary value (EMV) in the above scenario? (10 marks)
- What is the reasonable amount that a consultant should be paid for a perfect forecast of the economy? (5 marks)
- Assuming an uncertainty situation, draw an opportunity loss table from the above data and determine what decision will be appropriate (6 marks)

[Total 25 Marks]

QUESTION 5.

- a. Explain the inventory management implications of Vilfredo Pareto's 80/20 rule concepts **(10 marks)**
- b. A Mbabane law firm uses an average of 40 reams of bond paper per day. The firm operates 260 days per year. Storage and handling costs of the paper are E30 per year per ream and it costs approximately E60 to order and receive a shipment of paper.
- i. What order size would minimize the sum of annual ordering and carrying cost? **[5 marks]**
- ii. Compute the total annual cost using your order size from the previous question **[5 marks]**
- iii. The administrator at the law firm is currently using an order size of 150 reams. The partners expect the office to be managed in a cost efficient manner. Would you recommend that the administrator use the optimum order size you calculated instead of the 150 reams? Illustrate. **[5 marks]**

[Total 25 Marks]

GOOD LUCK!!!!