

UNIVERSITY OF SWAZILAND

FACULTY OF COMMERCE

DEPARTMENT OF BUSINESS ADMINISTRATION

MAIN EXAMINATION PAPER; F/T STUDENTS

NOVEMBER 2013.

TITLE OF PAPER : OPERATIONS MANAGEMENT 1

COURSE CODE : BA 438/BA506

TIME ALLOCATED : THREE [3] HOURS

TOTAL MARKS : 100 MARKS

INSTRUCTIONS

1. TOTAL NUMBER OF QUESTIONS IN THIS PAPER IS 4
2. THE PAPER CONSISTS OF SECTION A AND SECTION B: ANSWER THE QUESTIONS IN SECTION A WHICH ARE COMPULSORY AND ANY TWO [2] QUESTIONS IN SECTION B.
3. THE MARKS ALLOCATED FOR A QUESTION/PART OF A QUESTION ARE INDICATED AT THE END OF EACH QUESTION/PART OF THE QUESTION.
4. NOTE: MAXIMUM MARKS WILL BE AWARDED FOR QUALITY, LAYOUT, ACCURACY, AND GOOD PRESENTATION OF WORK.
5. THIS PAPER MUST NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

SECTION A : ANSWER ALL QUESTIONS IN THIS SECTION [50 MARKS]

QUESTION 1.

1.1.

Matsapha Garage has developed a new device which should make the internal combustion engine more efficient. The chief mechanic is faced with three alternatives in regard to the marketing of this device. The garage can proceed to manufacture and distribute the device itself; in this case the garage would make a profit of E2,00 for each device sold. As a second choice, the garage can sell the patent outright to another company for E1 million. In the third case, the garage can sell the patent for E0,3 million and receive a royalty of E1,00 per device sold. Which is the optimal choice using the expectation principle if there is a 0,50 probability that the sales of the device will be 2,000,000 units, a 0,40 probability of sales of 800,000 units, and if there is 0,10 probability of 1,400,000 million units being sold? Set up the decision matrix before applying the expectation principle. (14 marks).

1.2.

Mtfongwaneni Industries is planning an assembly plant to take components from three suppliers, and send finished goods to six regional warehouses. The location of these and the amounts supplied or demanded are shown in the table below. Where would the company start looking for a site for the assembly plant? (13 marks)

<u>Location</u>	<u>X, Y</u>	<u>Supply/Demand</u>
Supplier 1	91, 8	40
Supplier2	93, 35	60
Supplier 3	3, 86	80
Warehouse1	83, 26	24
Warehouse 2	89, 54	16
Warehouse 3	63, 87	22
Warehouse 4	11, 85	38
Warehouse 5	9, 16	52
Warehouse6	44, 48	28

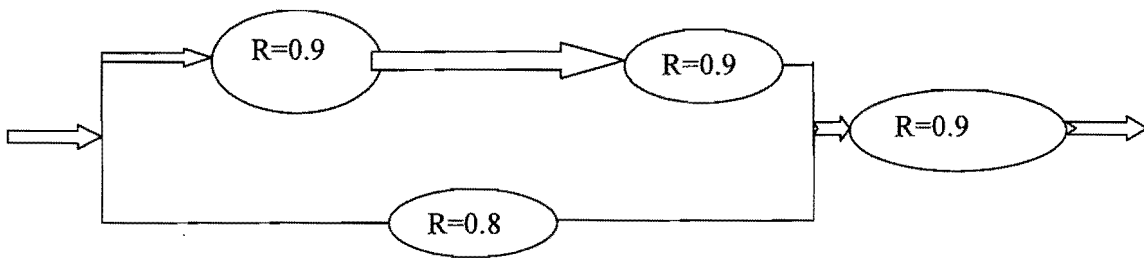
1.3.

Kwaluseni Holiday & Adventure Company sells an average of 100 holidays a month. The income generated has to cover fixed costs of E63,000 a month. Each holiday sold has travel, accommodation and other variable costs of E 500.

- a. Does the company make a profit if the price of its holiday is E 1,200? (6 marks)
- b. If the price of a holiday is reduced to E 1,000 and sales increase to 150 a month does the company still make a profit? (8 marks)

1.4.

Four pieces of equipment on an assembly line can be viewed as the components shown in the diagram below. What is the overall reliability of the line? (9 marks).



[Total Marks 50]

**SECTION B. ANSWER TWO [2] QUESTIONS ONLY FROM THIS SECTION.
EACH QUESTION CARRIES 25 MARKS.**

QUESTION 2.

2.1.

A photo processing company intends to open a new branch store in Mbabane. The table below contains information on two potential locations. Which site must the company select?

Factor	Weight	Scores out of 100	
		Site No.1.	Site No.2
Proximity to existing store	0.10	100	60
Traffic volume	0.05	80	80
Rental costs	0.40	70	90
Size	0.10	86	92
Layout	0.20	40	70
Operating costs	0.15	80	90

(10 marks)

2.2.

Swaziland Electronics specialises in manufacturing modern electronic components for exporting in the region. It also builds equipment that is used to build the components. Marvellous who is responsible for advising the company's CEO on electronic manufacturing equipment has developed the following table concerning a proposed facility.

Alternative	Profitability(E)		
	Strong market	Fair market	Poor market
Large facility	550,000	110,000	-310,000
Medium facility	300,000	129,000	-100,000
Small facility	200,000	100,000	-32,000
No facility	0	0	0

- i. What will be your maxi-max decision?
- ii. What will be your maxi-min decision?
- iii. What will be your Laplace decisions?
- iv. What will be your criterion of realism decision if you are told the realism coefficient applicable is 0.7?
- v. What will be your mini-max regret decision? (15 marks).

[Total Marks 25]

QUESTION 3.

Monthly sales of a product during the last 12 months were as follows:

Month	Sales [E(000)]	Month	Sales[E(000)]
1	1,850	7	1,980
2	1,920	8	2,100
3	1,800	9	2,070
4	1,875	10	2,150
5	1,960	11	2,210
6	2,040	12	2,180

Use information in the above table to do the following calculations;

- i. Naive forecasting for the 13th month. (2 marks)
- ii. Five months moving average forecasts from the 6th month through to 13th month. (4 marks)
- iii. Forecast for 13th month using exponential smoothing, (using a smoothing factor of 0.2 and an estimate of sales for month 1 of 1,850). (6 marks)
- iv. Show if there is any sales trend for the 12 months period and read year 13 sales from graph. (5 marks)
- v. Use the trend line equation to forecast sales for months 13 & 14. (8 marks)

[Total 25 Marks]

QUESTION 4.

4.1. Some students who recently graduated from university decided to utilise skills they learnt in some of the management courses such as Operations Management and Entrepreneurship management. One group teamed up to manufacture car security systems. They specialise in making two types of anti-burglar gadgets. Type 1 is made up of a length of steel rod with two hooks- like ends, one of which is to fit under the clutch pedal and the other end fits over the steering wheel. The two hooks are then held in place and secured by an adjustable steel latch-padlock arrangement. Type two is also made up of the same length of steel rod connecting two steel plate formed shapes. One form fits over the gear lever while the other fits over the handbrake lever. The two forms and steel rods are then held in place in a manner similar to that used by type 1 lock, using a latch-padlock arrangement.

The youths are able to sell all the car locks they can produce because of the recent increases in car thefts. Unfortunately, they can only get a maximum of 50 padlocks, 6 square meters of steel sheet, and 30 metres of steel rod per week. Each clutch lock is made up of 0.75m rod. Each gear lock requires 0.4m rod and 0.2 square meters steel sheet. Of course, each lock type is fitted with only one padlock.

A clutch lock brings in a profit contribution of E50, while a gear lock brings in E70. How many of each type of locking system should the youths produce and what will be the highest profit contribution? Use the graphical solution (corner point method) and also confirm your findings using the mathematical method to solve the problem (15 marks)

4.2. What are the issues that you will consider in developing guidelines for ethical behaviour in the Procurement department of an organisation? (10 marks)

[Total Marks 25]

END OF EXAMINATION: GOOD LUCK!!!