UNIVERSITY OF SWAZILAND

FACULTY OF COMMERCE

DEPARMENT OF BUSINESS ADMINISTRATION

SUPPLEMENTARY EXAMINATION PAPER; FULL TIME & IDE STUDENTS

JULY 2018.

TITLE OF PAPER : MANAGEMENT SCIENCE 1

COURSE CODE : BA 302/ BA406

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
3. ANSWER ALL QUESTION IN SECTION A AND ANY TWO [2] QUESTIONS IN SECTION B.
4. THE MARKS ALLOCATED FOR A QUESTION OR PART OF A QUESTION ARE INDICATED AT THE END OF EACH QUESTION OR PART OF THE QUESTION.
5. NOTE: MAXIMUM MARKS WILL BE AWARDED FOR QUALITY, LAYOUT, ACCURACY, AND EXPLANATIONS FOR STEPS USED TO SOLVE PROBLEMS

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.

Ezulwini Ajax is considering investing some money that he inherited. The following payoff table gives the profits that would be realised during the next year for three investment alternatives Ezulwini is considering

State of Nature

Decision Alternative	Good Economy	Poor Economy
Stock Market	80,000	- 20,000
Bonds	30,000	20,000
CD	23,000	23,000
Probability	0.5	0.5

   i.   What decision would maximise expected profit?   (4)

   ii.   What is the maximum amount that should be paid for a perfect forecast of the economy?   (6)

1.2.

According to latest management thinking, keeping stock is always to cover up for inefficiencies but some companies still insist on keeping inventory. Discuss advantages and disadvantages of keeping inventory.

(15)

1.3.

Room registrations at a Piggspick hotel have been recorded for the past 9 years. Management would like to determine the mathematical trend of guest registration in order to project future

occupancy. The estimate would help the hotel to determine whether future expansion will be needed. Given the following time series data. Room registrations are in thousands.

Year	1	2	3	4	5	6	7	8	9
Registrations	17	16	16	21	20	20	23	25	24

    i.   Use a three year moving average to forecast bookings for year 10   (6)

    ii.   Use exponential smoothing with an exponential smoothing factor of 0.4 to forecast bookings for year 10   (7)

    iii.   Calculate MAD and MSE using the three year moving average forecast   (5)

    iv.   Assuming forecast for year 1 is equivalent to the year's actual bookings, calculate MAD and MSE for exponential smoothing forecast.   (5)

    v.   Which of the two forecasts must be selected?   (2)

[TOTAL MRKS 50]

SECTION B; ANSWER TWO QUESTIONS OF YOUR CHOICE FROM THIS SECTION.

QUESTION 2.

2.1.

Hellenic distributors has an annual demand for a special water pump of 1400.The cost of a typical pump to Hellenic is E400.Carrying cost is estimated to be 20% of the unit cost, and the ordering cost is E 25 per order. If Hellenic orders quantities of 300 or more, it can get a 5 % quantity discount on the cost of the detectors Should Hellenic take the quantity discount? Assume demand is constant.   (10)

2.2

The Holiday Meal Turkey Ranch is considering buying two different brands of turkey feed and blending them to provide good, low-cost diet for its turkeys. Each feed contains in varying proportions, some or all of the three nutritional ingredients essential for fattening turkeys. Each kilogram of brand 1 purchased for example, contains 5 grams of ingredient A, 4 grams of ingredient B, and 0.5 grams of ingredient C. Each kilogram of brand 2contains 10 grams of ingredient A,3 grams of ingredient B, but no ingredient C.

The brand 1 feed cost the Ranch 2 cents a kilogram, while brand 2 costs 3 cents per kilogram.

Use LP to determine the lowest diet that meets the minimum monthly intake requirement for each nutritional ingredient   (15)

[TOTAL 25 MARKS]

QUESTION 3.

3.1

Thirteen girls entered the undergraduate programme introduced at a local university 2 years ago. The following table indicates what their grade points average(GPA) were after being in the programme for two years and what each student would score on entrance test(max 2400) when she was in high school.

TEST SCORE	1263	1131	1755	2070	1824	1170	1245	1443	2187	1503	1839	2127	1098
GPA	2.90	2.93	3.00	3.45	3.66	2.88	2.15	2.53	3.22	1.99	2.75	3.90	1.60

    i.   Is there any meaningful relationship between grades and entry exam scores?   (5)

    ii.   If a student scores 1200 on entrance exam what do you think her GPA will be ?   (8)

    iii.   What about a student who scores 2400   (2)

3.2.

Gabuzela Mahhala Electronics specialises in manufacturing modern electronic components .It also builds the equipment that produces the components. Thandaza who is responsible for advising the president of Gabuzela Mahhala Electronics on electronic manufacturing equipment has developed the following table concerning a proposed facility.

Profit E

	Strong market	Fair market	Poor market
Large Facility	550,000	110,000	- 310,000
Medium Faciliy	300,000	129,000	- 100,000
Small Facility	200,000	100,000	-32,000
No Facility	0	0	0

    a. Develop an opportunity cost table   (7)

    b. What is the mini-max regret decision?   (3)

[TOTAL MARK 25]

QUESTION 4.

A group of medical professionals is considering the construction of a private clinic. If the medical demand is high (favourable market) for the clinic, the physicians could realise a net profit of E 100,000. If the market is not favourable they could lose E40, 000. Of course they do not have to proceed, at all, in which case there is no cost. In the absence of any market data, the best the physicians can guess is that the clinic will be successful.

    i.   Construct a decision tree to help analyse this problem   (5)

    ii.   What should the medical professionals do?   (5)

    iii. Use the EMV approach to recommend the appropriate strategy given additional information detailed below and calculate the amount of money the physicians must be willing to pay for the information.   (15)

A Marketing Research firm that offered to do a survey for the medical professionals charged E 5,000 claiming their experiences enables them to use Baye's theorem to make the following statements of the problem:

Probability of the favourable market given a favourable study is 0.82,

Probability of an unfavourable market given a favourable study is 0.18,

Probability of a favourable market given an unfavourable study is 0.11,

Probability of an unfavourable market given an unfavourable study is 0.89

Probability of a favourable research study is 0.55 and

Probability of unfavourable research study is 0.45   [TOTAL MARKS 25]

END OF QUESTION PAPER: GOOD LUCK!!!!!!!!!