UNIVERSITY OF SWAZILAND

FACULTY OF COMMERCE

DEPARMENT OF BUSINESS ADMINISTRATION

SUPPLEMENTARY EXAMINATION PAPER; FULL TIME & IDE STUDENTS

JULY 2016.

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	E80, 000	- E20, 000
Bonds	30,000	20,000
CD	23,000	23,000
Probability	0.5	0.5

i. What decision would maximise expected profit? (8 marks)

ii. What is the maximum amount that should be paid for a perfect forecast of the economy? (7 marks)

1.2.

According to latest management thinking, keeping stock is one of the ways to cover up for inefficiencies but some companies still insist on keeping inventory. What reasons are given for keeping stock? (15 marks)

1.3.

Solve the following problem using algebraic solution

Minimize $Z = 8x1 + 12x2$

Subject to----------$5x1 + 2x2 \geq 20$

$4x1 + 3x2 \geq 24$

$X2 = 2$ (20 marks)

[TOTAL MARKS 50]

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

QUESTION 2.

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. You are given the following time series data. Room registrations (bookings) 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 marks)

ii. Assuming year 1 forecast is the same as that year's registration use exponential smoothing with an exponential smoothing factor of 0.4 to forecast bookings for year 10 (6 marks)

iii. Which of the two forecasting methods will be favourable based on MAD and MSE forecast accuracy tests? (13 marks)

[TOTAL MARKS 25]

QUESTION 3.

There has been some oil discovery in the Lubombo region of Swaziland. The UNISWA BA 302 class won some lucrative amount in a lottery game and prefer to go for oil mining and continue with their studies under IDE BA406, which is the same course anyway. They however have to make a decision soon based on the following information.

The alternative actions that the class can adopt are;

Don't drill (a1)

Drill with no partners (a2)

Drill in partnership with the University (a3)

Drill in partnership with family members (a4).

Drilling for oil has got its own natural risks and the following possible states of nature are likely to happen.

The BA302 group will find no oil (s1)

The BA302 group will find only 100,000 barrels of oil (s2) or, still

The BA302 group will find only 500,000 barrels (s3).

The BA302 group consulted a Geologist and have been advised that from previous drilling experience, the Geologist feels that there are 90 chances in 100 that there is no oil, 8 chances

in 100 that there are 100,000 barrels of oil and 2 chances in 100 that there will be 500,000 barrels of oil.

If the group does not drill then the profit that will be derived will be zero, regardless of what lies beneath the surface. Thus, a hole is to be drilled, there will be some cost and there may be revenues. The cost of drilling a well is $ 100,000.00, and if, and only if, oil is discovered, an extra $40,000.00 must be spent on equipment such as pipes and pumps. Finally oil at the well head can be sold for $7 a barrel. Under a2, the BA302 group would go it alone.

Suppose there is no oil, the group will experience some $100,000 loss in drilling cost, but they will not spend $40 000 as there will be no need for pumps and pipes and of course there will be no revenue. If 100,000 barrels are found, the group will reap revenues in the sum of $700,000.They will however need to pay the cost of drilling and to also pay for pumps and pipes. Finally, if they discover 500,000 barrels, there will be revenues from which the group will have to pay for both drilling and equipment.

If the group decides to drill in partnership with the University (alternative three) the UNISWA has offered to participate 50-50 with the group in both losses and gains.

The group has another opportunity to drill in partnership with family relatives. The BA302 group will pay only for the well equipment and pumps if needed and would receive$1 per barrel of oil recovered. The family members would take care of drilling costs and would receive $6 for each barrel.

The pay offs we are interested in are those for the BA302 group only because what their partners get or lose is of no importance to the BA302 group.

Find the expected profit for each alternative and then select the alternative with the greatest expected profit

[18 marks]

Which alternative will be selected using the minimax regret decision criteria [7 marks]

[TOTAL 25 MARKS]

QUESTION 4.

The probabilities of a good and bad market for a new product are initially assessed as 0.6 and 0.4 respectively and the company can also decide not to launch new product. A survey can be carried out to improve the accuracy of these probability estimates. In previous launches of other products, when the market was good, market surveys had predicted that it would be good in 8 cases of every 10, and when the market was poor surveys had predicted a poor market in 7 cases out of every 10. The net present value of a yield will be $5 million if the market is good and a $3 million loss if the market is poor. Should market research be undertaken and if so what is the maximum amount that should be paid for the survey?

[TOTAL MARKS 25]

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