UNIVERSITY OF ESWATINI

FACULTY OF COMMERCE

DEPARMENT OF BUSINESS ADMINISTRATION

EXAMINATION PAPER MBA STUDENTS

NOVEMBER 2018

TITLE OF PAPER : ADVANCED OPERATIONS MANAGEMENT & BUSINESS SIMULATION MODELS

COURSE CODE : BUS655

TIME ALLOCATED : THREE [3] HOURS

TOTAL MARKS : 100 MARKS

INSTRUCTIONS

1. TOTAL NUMBER OF QUESTIONS IN THIS PAPER IS 5
2. THE PAPER CONSISTS OF SECTION A AND SECTION B
3. ANSWER ALL QUESTION IN SECTION A AND ANY TWO [3] 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. CREDIT 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(a).

Explain the application of the concepts of JIT and Six-Sigma in the context of Eswatini manufacturers **[20 MARKS].**

QUESTION 1(b).

Study the following data about JCB Agricultural services that operates in the Kingdom of Eswatini. The company has the following distribution centres (DCs) shown in the table below. The following data shows the x axis and y axis locations of each distribution centre and the demand for these centres. Using this information and applying the centre of gravity theorem you are required to determine the location of a new distribution centre **[10 MARKS]**

Distribution centre	X axis	Y axis	Demand
Gilgal	2	9	6
Mhlume	6	7	14
Gege	7	13	15
Ntfonjeni	13	4	12
Nkilongo	9	9	5
Motshane	10	13	8
Sigwe	8	1	10
Pigg's Peak	17	3	112
Hosea	8	4	16

QUESTION 1(c).

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. Assume the economic order quantity model's assumptions are applicable in this case.

i.   What order size would minimize the ordering and carrying costs? **[5 MARKS]**

ii. Compute the total annual inventory cost using your order size calculated in (a) above.

[5 MARKS]

iii. The administrator at the Law firm is currently using an order size of 200 reams. The partners expect the office to be managed in a cost efficient manner. Would you recommend that the administrator uses the optimum order size you calculated in (a) instead 200 reams? Motivate your answer. **[10 MARKS]**

SECTION B: ANSWER TWO QUESTIONS OF YOUR CHOICE FROM THIS SECTION; EACH QUESTION CARRIES 25 MARKS.

QUESTION 2.

The following table contains figures on a monthly volume and unit costs for a random sample of 16 items from a list of 2000 inventory items at Mbabane Government Hospital. Assume 60% of the items are class A category, 30% B category and the balance C category.

Item	Unit cost	Usage	Item	Unit cost	Usage
K34	E100	200	F99	200	60
K35	250	600	D45	100	550
K36	360	150	D48	120	90
M10	160	25	D52	150	110
M20	200	80	D57	400	120
Z45	800	200	N08	300	40
F14	200	300	P05	160	500
F95	300	800	P09	100	30

a. Explain the Pareto analysis principle **[10 MARKS]**

b. Develop an A-B-C- classification for the above items **[10 MARKS]**

c. After reviewing your classification scheme, suppose that the Hospital Administrator decides to place item P05 into the A category. What would be some possible explanations for this decision? **[5 MARKS]**

QUESTION 3.

Michael has always been proud of his personal investment strategies and has done very well over the past several years. Over the past several months however, Michael has become very concerned about the stock market as a good investment. In some cases it could have been better for Michael to have his money in the bank than in the market. During the next year,

Michael must decide whether to invest $10 000 in the stock market or certificate of deposit (CD) at an interest rate of 9 %. If the market is good, Michael believes that he could get a 14% return on his money. With a fair market, he expects to get an 8 % return. If the market is bad, he will most likely get no return at all- in other words the return would be 0%. Michael estimates that the probability of a good market is 0.4, the probability of a fair market is 0.4, the probability of a bad market is 0.2, and he wishes to maximise his long term average return.

a. Develop a decision table for this problem and advise what the best decision is?

[5 MARKS]

b. If you hire a consultant he will give you additional information that can improve the quality of your decision, but of cause you need to pay the consultant. How much will you be willing to pay the consultant in the above case? **[10 MARKS]**

c. Compare decision making under risk and decision making under uncertainty

[10 MARKS]

QUESTION 4.

The following information relates to a project you are doing:

Activity	Predecessor	Optimistic Time	Most Likely Time	Pessimistic Time
		In	Days	
A	-	3	6	8
B	-	2	4	4
C	-	1	2	3
D	A,B	6	7	8
E	C	2	4	6
F	E	6	10	14
G	E	1	2	4
H	D	3	6	9
I	G,H	10	11	12
J	F,G	14	16	20

i. Calculate the expected time and variance for each activity **[10 MARKS]**
ii. Construct the network diagram using the activity on network (AON) approach

[5 MARKS]
iii. Determine the slack value for each activity **[5 MARKS]**
iv. What are the critical path and the expected project completion time **[5 MARKS]**

END OF EXAM; GOOD LUCK!