

UNIVERSITY OF ESWATINI
FACULTY OF COMMERCE
DEPARMENT OF BUSINESS ADMINISTRATION
FINAL EXAMINATION PAPER; MBA
DECEMBER 2019

TITLE OF PAPER : ADVANCED OPERATIONS MANAGEMENT
AND SIMULATION MODELLING

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 QUESTIONS IN SECTION A WHICH ARE COMPULSORY AND THREE [3] QUESTIONS IN SECTION B.
4. THE MARKS ALLOCATED FOR A QUESTION/PART OF A QUESTION ARE INDICATED AT THE END OF EACH QUESTION/PART OF QUESTION.
5. PLEASE CLEARLY SHOW ALL YOUR WORKINGS IN YOUR ANSWER BOOKLET

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

SECTION A: ANSWER ALL THE QUESTIONS IN THIS SECTION

QUESTION 1.1

Explain the components of an Operations management system [10 marks]

QUESTION 1.2

Demand for surgery at a Mbabane surgery has increased steadily over the past few years, as seen in the table below.

Year	Surgeries performed
1	45
2	50
3	52
4	56
5	58
6	--

The Chief Medical Officer predicted six years ago that demand in year 1 would be 42 surgeries. Using exponential smoothing with a weight of $\alpha=0.2$ develop forecasts for years 2 through 6 [10 Marks]

QUESTION 1.3

Briefly explain the five decision options you find under uncertainty [10 marks]

QUESTION 1.4.

Management of a popular Mbabane company is considering the introduction of a new product. The fixed cost to begin the production of the new product is E30,000. 00. The variable cost for the product is expected to be between E16 and E24 with a most likely value of E20 per unit. The product will sell for E50 per unit. Demand for the product is expected to range from 300 to 2100 units, with 1200 units the most likely demand.

What-if analysis is a key component in mastering Simulation modelling. In the above problem what will be the profit if you face the base-case scenario? What if you have the worst case scenario? What if you have the best case scenario? [10 marks]

[TOTAL MARKS FOR THE SECTION IS 40]

SECTION B: ANSWER THREE QUESTIONS OF YOUR CHOICE FROM THIS SECTION: EACH QUESTION CARRIES 20 MARKS.

QUESTION 2.

Carefully study information in the table below:

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	--	--	A,B	C	C	E	C	D,F,G	D,F	H	I,J
Optimistic time	4	6	2	8	7	4	4	4	4	3	2
Most probable time	6	8	4	10	10	6	6	6	16	4	4
Pessimistic time	8	16	6	24	13	8	20	8	14	5	6

- What is the difference between project evaluation review technique and critical path method? [4 marks]
- Draw a network diagram to represent information in the above table [5 marks]
- Explain the meaning of a slack value of 0 [3 marks]
- Find the critical path in the above problem [6 marks]
- What is the project's expected completion time? [2 marks]

[TOTAL 20 MARKS]

QUESTION 3

The Faculty of Commerce at the University of Swaziland introduced a new course in Project Management which became so popular among all Faculties. As a result, the University Book Shop's book sales for the prescribed Project management book drastically went up. The Book shop management is aware of the advantages of keeping adequate stocks so that stocks do not run out. However, management is also worried about the costs of overstocking the prescribed book, in case they hold too many copies in stock which will not be bought.

Analysis of sales for the Project Management text for the past 50 weeks reveals the following:

Sales per Week(Units)	Frequency
40	6
50	5
60	9
70	12
80	8
90	7
100	3

The Book Shop has negotiated with the supplier to have the book printed locally so that it can be ordered at short notice. If the Book Shop maintains a constant supply of 80 books in any given week, how many times will the bookshop fail to meet demand in a 20 week simulation? Please use random numbers from the 12th column of the attached table beginning with the random digits 91. [12 marks]

According to simulation results what is the average number of book sales per week over the 20 week period, including stock outs? [4 marks]

Will you get the same sales figure if you used the expectation theory? [4 marks]

[TOTAL 20 MARKS]

QUESTION 4

Lean management, Six Sigma and Just in time (JIT) are three great process improvement strategies of the century. Articulate these three operations management techniques clearly demonstrating that while these three concepts are related they do have differences among themselves.

[TOTAL 20 MARKS]

QUESTION 5

UNESWA has a successful Master of Education (MEd) programme. The programme is designed for professionals that require excelling in the field of education. The programme has grown from a class of 25 students 10 years ago to its current enrolment level of 148 students.

The university administration believes that the programme's growth has resulted primarily from its well organised marketing efforts. To analyse the relationship between programme enrolment and marketing expenditures, data covering the past 10 years have been collected. The data are shown in the table below:

Year	Student enrolment(y)	Promotional Expenditure(x)(E,000)
1	25	3
2	38	4
3	75	6
4	86	10
5	102	11
6	98	12
7	115	14
8	128	14
9	130	15
10	148	18

- a. What is an independent variable and in the problem which element is the independent variable [2 marks]
- b. What is a dependent variable and in the problem which element is the dependent variable [2 marks]
- c. Using an accurate scale (make use of graph paper), draw a scatter graph and say what the enrolment will be if the university spends E20, 000. 00 on marketing activities [6 marks]
- d. Develop a regression model for the problem and use the same model to forecast student enrolment when the marketing budget is E20,000.00 [10 marks]

[TOTAL 20 MARKS]

GOOD LUCK!!!!