

UNIVERSITY OF SWAZILAND  
FACULTY OF COMMERCE  
DEPARTMENT OF BUSINESS ADMINISTRATION  
FINAL EXAMINATION PAPER; IDE STUDENTS  
MAY 2014

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TITLE OF PAPER : OPERATIONS MANAGEMENT

COURSE CODE : BA 513

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 QUESTIONS IN SECTION A AND ANY TWO [2] 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. NOTE: MAXIMUM MARKS WILL BE AWARDED FOR QUALITY, LAYOUT, ACCURACY, AND GOOD PRESENTATION OF WORK.

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

## SECTION A. ANSWER ALL QUESTIONS IN THIS SECTION

## QUESTION 1.

- 1.1. Compute MAD, MSE, and MAPE for the following data, showing actual and forecasted numbers of accounts received and recommend the best accuracy measure. Use a 3 period moving average to forecast accounts to be serviced in period 9.

<u>Period</u>	<u>Actual</u>	<u>Forecast</u>
1-----	217	215
2-----	213	216
3-----	216	215
4-----	210	214
5-----	213	211
6-----	219	214
7-----	216	217
8-----	212	216

(20 marks)

- 1.2. Mbabane municipal police handed out the following tickets on a summer weekend. You are required to make a check sheet and a Pareto diagram for the types of infractions.

<u>Ticket Number</u>	<u>Infraction</u>	<u>Ticket Number</u>	<u>Infraction</u>
1	Excessive speed	11	Expired disc
2	Expired disc	12	Parking violation
3	Improper turn	13	Improper turn
4	Excessive speed	14	Parking violation
5	Parking violation	15	Excessive speed
6	Parking violation	16	Parking violation
7	Excessive speed	17	Parking violation
8	Parking violation	18	Parking violation
9	Improper turn	19	Excessive speed
10	Parking violation	20	Parking violation

(15 marks)

**1.3.** The Department of Education at a major Swaziland university will be scheduling faculty staff to teach courses during semester 1 of the coming academic year. Four courses need to be covered. The four courses are at Diploma, UG, MED, and Ph.D. levels. Four professors will be assigned to the courses, with each professor receiving one of the courses. Student evaluations of the professors are available from previous terms. Based on a rating scale of 4(excellent), 3 (good), 2 (average), 1 (fair), and 0 (poor), the average student evaluations for each professor are shown in the table below. Professor D does not have a Ph.D. and cannot be assigned to teach the Ph.D. level course. If the department head makes teaching assignments based on maximising the student evaluation ratings over all four courses, what staffing assignments should be made? **( 15 marks)**

Professor	Course			
	Diploma	UG	MED	Ph.D.
A	2.8	2.2	3.3	3.0
B	3.2	3.0	3.6	3.6
C	3.3	3.2	3.5	3.5
D	3.2	2.8	2.5	-

**[Total 50 Marks]**

**SECTION TWO: ANSWER TWO (2) QUESTIONS OF YOUR CHOICE FROM THIS SECTION.**

**QUESTION 2.**

2.1.

Sibusiso Zwane is considering four alternative locations for a new electronics warehouse. After a lot of discussions he made a list of important factors, their relative weights, and scores for each site as shown in the table below. What is the relative importance of each factor? Which site would you recommend?

Factor	Maximum	A	B	C	D
	Score				
Climate	10	8	6	9	7
Infrastructure	20	12	16	15	8
Accessibility	10	6	8	7	9
Construction cost	5	3	1	4	2
Community attitude	10	6	8	7	4
Government views	5	2	2	3	4
Closeness to suppliers	15	10	10	13	13
Closeness to customers	20	12	10	15	17
Availability of workers	5	1	2	4	5

**(10 marks)**

2.2. Plot the following data on a graph, and verify visually that a linear trend line is appropriate. Develop a line trend equation for the same data, and then use the equation to predict the next two values of the series.

<u>Period</u>	<u>Demand</u>
1	44
2	52
3	50
4	54
5	55
6	55
7	60
8	56
9	62

(15 marks)

[Total 25 Marks]

**QUESTION 3.**

**3.1**

Phumuza Industries in Mbabane is planning an assembly plant to take components from three suppliers, and send finished goods to six regional warehouses. The locations of these and the amounts supplied or demanded are shown in the table below. Where would you start looking for a site for the assembly plant? Please clearly show all your calculations.

Location	X, Y co-ordinates	Supply/Demand
Supplier 1	91, 8	40
Supplier 2	93, 35	60
Supplier 3	3, 86	80
Warehouse 1	83, 26	24
Warehouse 2	89, 54	16
Warehouse 3	63, 87	22

Warehouse 4	11, 85	38
Warehouse 5	9, 16	52
Warehouse 6	44, 48	28

(15 marks)

3.2 Discuss Procurement Ethics issues that you would address when developing a procurement policy for your company. (10 Marks)

[Total 25 Marks]

**QUESTION 4.**

Processing times (including set up times) and due dates for five jobs waiting to be processed at a work centre are given in the following table (assume jobs arrive in the given order). Determine the sequence of jobs, the average flow time, average tardiness, and average number of jobs at the work centre, under each of the following rules;

- FCFS
- SPT and
- EDD

<u>Job No.</u>	<u>Job time [days]</u>	<u>Due Dates</u>
A	12	15
B	6	24
C	14	20
D	3	8
E	7	6

(Total 25 Marks)

**END OF EXAMINATION: GOOD LUCK!!!!!!**