

UNIVERSITY OF SWAZILAND
FACULTY OF COMMERCE
DEPARTMENT OF BUSINESS ADMINISTRATION
MAIN EXAMINATION PAPER; IDE STUDENTS
MAY, 2015

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.

CASE STUDY. CAREFULLY READ THE CASE STUDY BEFORE ATTEMPTING TO ANSWER THE CASE STUDY QUESTIONS.

A company that is into the production of chairs for schools and colleges has come a very long way in trying to improve the manner in which its operations are managed. The company's desired TQM status will not be attained until the problems being experienced in two primary inputs of MRP namely BOM and MPS have been addressed.

For example in the company's manufacturing division the production management team is failing to do simple calculations to determine parts, components and assembly requirements such that the company sometimes is under stocked on some items and over stocked on other items.

Can you imagine a situation where a production manager who enjoys a very generous package is taking weeks to come up with quantities of the different components needed to execute an order for chairs that came through marketing? The manager is aware that demand for product S representing chairs is 100 units. Each unit of S requires 1 unit of T and $\frac{1}{2}$ unit of U. Each unit of T requires 1 unit of V, 2 units of W, and 1 unit of X. Finally each unit of U requires $\frac{1}{2}$ unit of Y, and 3 units of Z. Items available in stock have been listed as follows:

COMPONENTS	QUANTITY ON HAND
S	20
T	20
U	10
V	30
W	30
X	25
Y	15
Z	10

From the MPS side the company's CEO was expecting the production schedule on his desk last week before meeting with the Board Chairman. The CEO was embarrassed when the Chairman who had gone through the production schedule told him that the Production Manager he hired was very incompetent and he wanted him fired because he had an attitude towards the Marketing people yet they are the ones who brought 80% of the business into the company. The Production manager had failed to calculate the ATP required by the Marketing team although the following information was on his desk:

- i. Beginning inventory 640
- ii. Weekly forecasts for the planning horizon of 8 weeks, 300 per week for week 1 to week 4 and 400 per week for week 5 to week 8.
- iii. The Marketing Director confirmed that the Production manager was given information about confirmed orders as follows:

Week	1	2	3	4	5
Quantity	330	200	100	40	20

- iv. The company policy is to produce 700 units per production run whenever the on hand inventory is negative.

QUESTION 1.

- a. From your understanding of MRP, MRP11 and ERP what is ATP and why is it important? (7 marks)
- b. Clearly explain what dependent demand is all about with reference to the manufacturing of chairs (7 marks)
- c. If you have been hired to assist the Production manager and he has tasked you to compute the components requirements for producing the required 100 chairs show how you will do it taking into account the items in stock and not forgetting to draw the BOM tree diagram (15 marks)
- d. Prepare the correct MPS for the company showing Projected on hand inventory, MPS and ATP figures. (21 marks)

[Total 50 Marks]

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

QUESTION 2.1

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)

Course					
Professor	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	-	

QUESTION 2.2

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 and why? **(10 marks)**

Factor	Maximum Score				
		A	B	C	D
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

[Total 25 Marks]

QUESTION 3.1.

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 predict the period 10 value of the series.

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

(15 marks)

QUESTION 3.2

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. (10 marks)

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

[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;

a. FCFS

b. SPT and

c. 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 25Marks]

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