UNIVERSITY
OF
JOHANNESBURG

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

DEPARTMENT OF QUALITY AND OPERATIONS MANAGEMENT

PROGRAMME	:	NATIONAL DIPLOMA OPERATIONS MANAGEMENT
SUBJECT	:	OPERATIONS MANAGEMENT 2
CODE	:	BPJ22A2
DATE	:	WINTER SSA EXAMINATION 2015 21 JULY 2015
TIME	:	(SESSION 1) 08:00 – 11:00
TOTAL MARKS	:	100
WEIGHTS	:	50%

EXAMINER	:	MS K. MUSHAVHANAMADI.
(Internal) MODERATOR	:	DR P. KHOLOPANE
NUMBER OF PAGES	:	3 pages

INSTRUCTIONS TO CANDIDATES:

- Answer ALL questions.
- This is a closed book EXAM.
- Leave margins and spaces between the questions.
- Show all your calculations.
- Unless otherwise indicated, express your answers correct to two (2) decimal places.
- Where appropriate, indicate the units of your answer. (e.g. Hour, R)
- Number your answers clearly.
- Write neatly and legibly
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.

SECTION A   SHORT QUESTIONS   35 MARKS

1. Differentiate between Mean Absolute Deviation and Mean Squared error   (6)

2. In some inventory models, the optimal behavior occurs where ordering costs and carrying costs are equal to one another. Provide an example of a model where this "rule" does not hold; explain how the model's results are optimal anyway.   (6)

3. Describe the difference between a fixed-quantity and a fixed-period inventory system? (6)

4. Define aggregate planning and its objectives.   (5)

5. Identify the limitations to job expansion.   (5)

6. What is mutual trust? What is its link to a firm's human resource strategy?   (7)

SECTION B   CALCULATIONS   65 MARKS

1. During the past 8 quarters, the port of Baltimore has unloaded large quantities of grain from ships. The port's operations manager wants to test the use of Exponential smoothing to see how well the technique works in predicting tonnage unloaded. He guesses that the forecast of grain unloaded in the first quarter was 175 tons. Two values of α are to be examined: $\alpha = 0.10$ and $\alpha = 0.50$

QUARTER	ACTUAL TONNAGE UNLOADED
1	180
2	159
3	175
4	190
5	205
6	180
7	182

1.1 Compare the actual data with the data we forecast (using each of the two   values) and then find the absolute deviation, Mean Absolute Deviation (MAD) and Mean Absolute Deviation (MSE).   (20)

2. The annual demand for an item is 40,000 units. The cost to process an order is R40 and the annual inventory holding cost is R3 per item per year. What is the optimal order quantity, given the following price breaks for purchasing the item? (30)

Quantity	Price
1-1,499	R2.50 per unit
1,500 - 4,999	R2.30 per unit
5,000 or more	R2.25 per unit

2.1 What is the optimal behavior?
2.2 Does the firm take advantage of the lowest price available? Explain.

3. A manager has prepared a forecast of expected aggregate demand for the next six months. Develop an aggregate plan to meet this demand given this additional information: A level production rate of 100 units per month will be used. Backorders are allowed, and they are charged at the rate of R8 per unit per month. Inventory holding costs are R1 per unit per month. Determine the cost of this plan if regular time cost is R20 per unit and beginning inventory is zero. (15)

MONTH	FORECAST
1	80
2	100
3	120
4	110
5	100
6	90