**FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT**
**MAIN EXAM**

**DEPARTMENT OF QUALITY AND OPERATIONS MANAGEMENT**

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| **PROGRAMME** | : | NATIONAL DIPLOMA<br>OPERATIONS MANAGEMENT |
| **SUBJECT** | : | OPERATIONS MANAGEMENT 2A |
| **CODE** | : | OPM22A2 |
| **DATE** | : | 6 JUNE 2019 |
| **DURATION** | : | 3 HOURS |
| **TIME** | : | 08:30 – 11:30 |
| **TOTAL MARKS** | : | 100 |
| **WEIGHTS** | : | 50% |
| **EXAMINER** | : | MR. E.M. BAKAMA |
| **INTERNAL MODERATOR** | : | MR. N.S. MADONSELA |
| **NUMBER OF PAGES** | : | 3 pages (Including cover page & Aggregate Planning sheet) |

**INSTRUCTIONS TO CANDIDATES:**

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

## SECTION A: THEORY 50 MARKS

1. Identify and explain the core job characteristics. (10)
2. How would you explain the steps for the general procedure of aggregate planning? (6)
3. Identify and explain the three types of Forecasts (6)
4. Using a graph, identify and provide a brief explanation of every phase in a Product Life Cycle (8)
5. Why do organizations need to do aggregate planning? (8)
6. What are the three Aggregate Planning Strategies that companies generally use and explain each one of them? (6)
7. How would you classify the three aggregate planning inputs? Give example for each of them (6)

## SECTION B: INVENTORY MANAGEMENT 25 MARKS

Clement Bait and Tackle has been buying a chemical water conditioner for its bait (to help keep its baitfish alive) in an optimal fashion using EOQ analysis. The company uses 2500 units during the course of a year, all the necessary supplies the company needs are purchased from a supplier 90 miles away. The following information is known about the manufactured products:

- Annual demand: 2500 units
- Holding cost per unit per year: R1.5
- Order cost per order: R18.75
- Lead time: 2 days
- Working days per year: 250

a) Given the above information, what would be the economic order quantity? (4)

b) Given the EOQ, what would be the average inventory? What would be the annual inventory holding cost? (4)

c) Given the EOQ, how many orders would be made each year? What would be

the annual order cost? (6)

d) Given the EOQ, what is the total annual cost of managing the inventory? (4)

e) What is the time between orders? (3)

f) What is the reorder point (ROP)? (4)

## SECTION C: FORECASTING 25 MARKS

Student's registrations at UNISA have been recorded for the past 9 years. To project future space, management would like to determine the mathematical trend of student's registration. These estimates will help the university to determine whether future expansion will be needed. Given the following time-series data,

| Year | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|
| Registrations | 20 | 22 | 21 | 18 | 18 | 23 | 25 | 22 | 25 |

Develop a regression equation relating registration to time (e.g. a trend equation). Then forecast 2008 registrations (SHOW ALL YOUR CALCULATIONS)

GOODLUCK ☺