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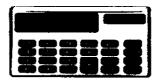| MNO2601 | (497233) | May/June 2012 |
| MNO202B | (494040) | |

PRODUCTION AND OPERATIONS MANAGEMENT

Duration   2 Hours   70   Marks

EXAMINERS ·
FIRST   MS AP PILLAY
SECOND   MS I VAN WYK

Use of a non-programmable pocket calculator is permissible

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The paper consists of 9 pages plus instructions for the completion of a mark reading sheet

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Make sure that the following information appears on the cover of your answer book.
•   Your student number
•   The module code (MNO2601)
•   All the numbers of the questions you have answered

This examination paper consists of two sections   Section A contains 10 multiple-choice questions which count
only one mark each   Section B consists of **three essay-type questions** of 30 marks each of which the
student **has to select any two questions** and answer them for 60 marks   Section A and B together thus
count 70 marks

SECTION A   STUDENTS MUST ANSWER ALL THE QUESTIONS IN THIS SECTION   10 Marks

SECTION B   SELECT ANY TWO (2) OF THE THREE (3) QUESTIONS   60 Marks

                                                        TOTAL   70 Marks

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RECOMMENDATION: PLEASE CAREFULLY CONSIDER THE ABOVE ALLOCATION OF MARKS AND
TOTAL TIME LIMITATION (TWO HOURS) BEFORE DECIDING ON WHICH SECTION TO ANSWER FIRST.

SECTION A

1   Which **one** of the following statements is **incorrect**?

1   Some operations produce products and services by changing inputs into outputs

2   One set of inputs to any operation's processes are transformed resources

3   One set of inputs to any operation's processes are transforming resources

4   Within any operation the mechanism that transform inputs into outputs are called processes

5   Operations management is relevant to all parts of the business

2   Choose the **correct** option(s)

a)   The continuing responsibility of operations managers is to improve the performance of their operation, thus increasing revenue and decreasing costs

b)   Planning and control is the activity of deciding what the operations resources should be doing and then ensuring that it is done

c)   Operations managers need to understand the strategic objectives of the organisation

d)   Operations managers have a set of general principles that can guide decision-making toward the organisation's long term goals

e)   Operations managers play a crucial role in designing the operations' products, services and processes

1   a b

2   c e

3   d e

4   None of the statements are correct

5   All of the statements are correct

3   Yummy Patties takes 1 2 minutes to make a hamburger If the company has limited the number of
    customers waiting to 10 and the maximum waiting time per customer should be 4 minutes, the number
    of staff should be serving the customers according to Little's Law should be

    1   10

    2   4

    3   3

    4   6

    5   5

4   Which **four** of the following statements are **correct**?

    a   Operations attempt to overcome higher costs of high variety by standardising their products

    b   Many organisations have improved their profitability by reducing variety

    c   The use of common elements in a product or service can simplify design complexity

    d   The modular designed sub-components of products and services can be put together differently to
        create a wider choice

    e   In order to overcome loss of business, variety of products and services should be increased,
        regardless of the cost factors

    1   a c d e

    2   b c d e

    3   a b d e

    4   a b c e

    5   a b c d

5   The sequence or flow of goods and/or services in the transformation model is as follows

   1   Input→Output→Market

   2   Input→Transformation process→Market

   3   Needs→Input→Transformation process→Market→Output

   4   Input→Transformation process→Output

   5   Needs→Transformation process→Market

6   Choose the **correct** option What is the main objective of layout design?

   a)   Inherent safety to staff and customers

   b)   Accessibility to staff and customers

   c)   To inconvenience staff members

   d)   To prove that management has a planning system

   e)   Optimal use of space

   1   a b c

   2   b d e

   3   a b e

   4   a b d

   5   a d e

7   Please indicate which **one** option is **incorrect**

   1   Cinemas who schedule a series of movies before tickets are sold is an example of make-to-order
       planning and control

   2   The planning and control necessary for a specialist function organiser is called resource-to-order

   3   A house builder with standard designs chooses to build a house only when he receives a firm order
       from a client This is an example of a make-to-order planning and control

   4   A conference facility with permanent resources that starts to plan a function on receipt of a signed
       'customer request for function' form is an example of create-to-order planning and control

   5   A builder who erects pre-designed standard houses or townhouses without an order for it is an
       example of make-to-stock planning and control

8   Which **one** of the following statements is **correct**?

    1   Demand forecasting is the sole responsibility of the sales and marketing departments

    2   To try and meet demand, operation managers need to decide on output in advance in order to plan
        for sufficient capacity

    3   Forecasts should be expressed in money terms and not capacity

    4   Operation managers can only react to demand and cannot plan for it

    5   Emergency services, for example, can effectively plan ahead for a year at a time

9   Operations management is important because it results in certain advantages for business

    *Which **one** of the following statements **does not** embody a typical advantage associated with the
    operations of a business?*

    1   It can reduce the costs of producing products or rendering services more efficiently

    2   It can increase revenue by increasing customer satisfaction through good quality and service

    3   It can reduce the capital employed by increasing the effective capacity of the operation

    4   It can provide the basis for future innovation

    5   It contributes to greater environmental impact awareness

10. The ABC system

    1   teaches the "ABC basics" of the production/operations system

    2   classifies the different types of items kept in an inventory by their usage value

    3   is also known as the Pareto law

    4   allows inventory managers to concentrate their efforts on the production/operations system

    5   is an improvement on the mechanical MRP I -run

SECTION B

**SELECT AND ANSWER ANY TWO (2) OF THE FOLLOWING THREE (3) ESSAY-TYPE QUESTIONS.
EACH QUESTION COUNTS 30 MARKS.**

QUESTION 1

1 1 Operations management can 'make or break' any business How can the operations functions contribute to the success of the business/organisation? Describe four advantages which may result from having an efficient and effective operation   (5)

1 2 The aim of process design is to ensure that the performance of the process is appropriate for what it aims to achieve Explain the impact of the 5 strategic performance objectives and list the benefits   (10)

1 3 Planning and control is concerned with the reconciliation between what the market requires and what the operation's resources can deliver Summarise the activities that are involved in planning and control?   (4)

1 4 A Unisa library has adopted a policy whereby there should never be more than 10 students waiting at the counter where library books are issued It takes the library assistant on average 3 minutes to issue the books to the student The library policy further makes provision that a student should not wait longer than 6 minutes in the queue Using Little's Law, calculate how many library assistants should be at the counter issuing books Also **explain the concept** itself and **show** all your **calculations.**   (5)

1 5 **Micro productivity** has traditionally been explained as the ratio of output to input, whereby productivity improvement involves more efficient utilisation of all resources to maximise output with minimum input

    a) Why is **micro productivity important** for production/ operations management?
    b) The DPA model is used in conjunction with the DPA Productivity management process to help us gain a better understanding of how productivity improvement could affect a business and its profitability **Illustrate** the **DPA productivity management process**, clearly outlining the five sequential steps

(6)

[30]

QUESTION 2

2 1 "Layout" of an operation refers to how its transforming resources are positioned relative to each other and how its various tasks are allocated to these transforming resources Briefly describe one advantage and one disadvantage for each of the basic layout types and provide an example of each layout type   (10)

2 2 A partially completed **Master Production Schedule** (MPS) for a furniture manufacturer's sofa is illustrated in the table below for weeks 1 to 6 A **chase capacity strategy** is adopted throughout and the goal is to keep safety stock at 5 Lead time is 0

	W1	W2	W3	W4	W5	W6
Demand	20	20	10	25	30	35
Available						
MPS						
On hand = 30						

Required: Redraw and complete the MPS schedule for weeks 1 to 6   (6)

2 3 By means of an **illustration,** indicate how the P and D ratios differ over the life cycle from obtaining resources, to delivering to customers for the following **types of planning and control:**

    a)   **Resource-to-order**   (2)
    b)   **Make-to-order**   (2)
    c)   **Make-to-stock**   (2)

                                                     (6)

2 4 A car manufacturer has a painting line with a design capacity of 88 square meters per minute The line is operated 24 hours a day, 7 days a week Records for a week show the following lost time in production

1	Product changeovers	14 hrs
2	Regular maintenance	11 hrs
3	No work scheduled	8 hrs
4	Quality sampling checks	19 hrs
5	Shift change times	17 hrs
6	Maintenance breakdown	12 hrs
7	Quality failure investigation	17 hrs
8	Paint stock-outs	15 hrs
9	Labour shortages	6 hrs
10	Waiting for paint	8 hrs
	Total	127 hrs

Calculate
    a) Design capacity   (1)

    b) Effective capacity   (2)

    c) Actual output   (1)

    d) Utilisation   (2)

    e) Efficiency   (2)

                                                     (8)

                                                     [30]

QUESTION 3

3 1 The production/operations processes of a **BMW motor manufacturing plant** and a **mass transport business** like **South African Airways (SAA)** will differ significantly Use the transformation process model to clearly differentiate, in both contexts, between the **transformed resources**, the **transforming resources**, the **type of transformation process** and the **outputs** What is the fundamental difference between these two transformation processes?   (9)

3 2 An operations manager approaches you with the following information relating to an MRP plan for **product A.** 100 units of product A are required for delivery in seven weeks time The lead time for the product is 2 weeks, and the number of units on hand is 20

    a) **Redraw** and **complete** the following **MRP schedule** for **product A** according to the information provided

PRODUCT A	W1	W2	W3	W4	W5	W6	W7
Gross Requirements							100
Scheduled receipts							
On-hand inventory							
Planned order release							

          (2)

Assume that each unit of **product A** requires 2 units of **product B** The lead time for product B is 1 week and the inventory on hand is 40 In line with your completed MRP schedule for the product A, calculate the following for product B

    b) What is the **gross requirement** for product B?   (1)
    c) In **what week** would you release the order for product B?   (1)
    d) **How many units** are required in this planned order release?   (2)

          (6)

3 3 Pret A Manger has opened more than 130 food shops since its opening in the mid 1980's The company says its secret is to focus continually on quality – not just of the food but every aspect of their business The shops have their own kitchen where fresh ingredients are delivered in the morning and food was prepared throughout the day The company rejected the idea of a huge centralised sandwich factory even though it could significantly reduce costs Pret also manages and sells their shops directly so that it can ensure consistently high standards in all the shops Customer feedback is regarded as very important Examining customers' feedback for improvement ideas is a key part of weekly management meetings and the daily team briefs in each shop

    a   What are the advantages and disadvantages of Pret A Manger organising itself so that the individual shops make the sandwiches they sell? Briefly describe three (3) of the advantages and three (3) of the disadvantages   (6)

    b   How can effective operations management contribute to the shops' success? Describe any four
          (4)

          (10)

3 4 In essence, job design and work organisation defines the way in which people go about their working lives
       Describe the key elements of job design   (5)

                                                                                                  [30]

                                          Section B: Any 2 questions x 30 marks = 60 marks

                                     TOTAL NUMBER OF MARKS (SECTIONS A AND B) = [70]

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UNIVERSITEIT VAN SUID-AFRIKA

EXAMINATION MARK READING SHEET

EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT e.g PSY100-X
STUDIE-EENHEID bv PSY100-X

①

③ INITIALS AND SURNAME
VOORLETTERS EN VAN ....

PAPER NUMBER
VRAESTELNOMMER **②**

④ DATE OF EXAMINATION
DATUM VAN EKSAMEN ....

⑤ EXAMINATION CENTRE (E G PRETORIA)
EKSAMENSENTRUM (BV PRETORIA) ....

STUDENT NUMBER
STUDENTENOMMER **⑥**

UNIQUE PAPER NO
UNIEKE VRAESTEL NR **⑧**

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| c9⊐ c9⊐ c9⊐ c9⊐ c9⊐ c9⊐ |

For use by examination invigilator

Vir gebruik deur eksamenopsiener

◆

IMPORTANT	BELANGRIK
1 USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET	1 GEBRUIK SLEGS N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
2 MARK LIKE THIS ⏴⏵	2 MERK AS VOLG ⏴⏵
3 CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY	3 KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4 ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT	4 VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5 CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY	5 KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
6 CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY	6 KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7 CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED	7 MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8 DO NOT FOLD	8 MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

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1	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	36	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	71	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	106	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
2	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	37	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	72	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	107	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
3	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	38	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	73	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	108	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
4	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	39	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	74	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	109	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
5	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	40	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	75	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	110	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
6	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	41	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	76	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	111	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
7	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	42	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	77	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	112	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
8	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	43	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	78	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	113	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
9	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	44	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	79	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	114	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
10	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	45	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	80	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	115	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
11	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	46	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	81	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	116	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
12	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	47	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	82	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	117	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
13	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	48	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	83	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
14	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	49	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	84	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
15	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	50	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	85	c1⊐ c2⊐	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
16	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	51	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐		c2⊐ c5⊐	121	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
17	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	52	c1⊐ c2⊐ c3⊐ c4⊐	86	c2⊐ c3⊐ c4⊐ c5⊐	122	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
18	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	53	c1⊐ c2⊐ c3⊐ c5⊐	87	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	123	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
19	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	54		89	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	124	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
20	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐		c2⊐	90	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	125	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
21	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	56	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	91	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	126	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
22	c1⊐ c2⊐ c3⊐	57	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	92	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	127	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
23	c1⊐ c2⊐ c3⊐ c4⊐	58	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	93	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	128	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
24	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	59	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	94	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	129	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
25	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	60	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	95	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	130	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
26	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	61	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	96	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	131	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
27	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	62	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	97	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	132	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
28	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	63	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	98	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	133	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
29	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	64	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	99	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	134	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
30	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	65	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	100	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	135	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
31	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	66	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	101	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	136	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
32	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	67	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	102	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	137	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
33	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	68	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	103	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	138	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
34	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	69	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	104	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	139	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐
35	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	70	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	105	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐	140	c1⊐ c2⊐ c3⊐ c4⊐ c5⊐

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