FINAL %	

UNISA

MNO3701

MAY / JUNE 2018

PRODUCTION AND OPERATIONS MANAGEMENT

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Question no	Marks					
	Examiners					
	1			2		
Q1						
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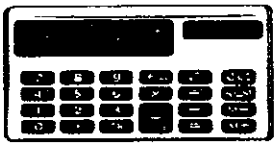

UNIVERSITEITSEKSAMENS

UNISA university of south africa

MNO3701

May/June 2018

Production and Operations Management

Duration 2 Hours

70 Marks

EXAMINERS :

FIRST	PROF AS TOLMAY
SECOND	DR AP AMADI-ECHENDU
EXTERNAL	MR J VENTER

Use of a non-programmable pocket calculator is permissible

Closed book examination.

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This paper consists of 26 pages

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Make sure the following information appears on the cover of your answer script:

- your student number
- your identification number
- date of the examination and the examination venue

This examination paper consists of two sections

Section A consists of question 1, which contains ten multiple-choice questions. Please answer this question in the block provided in your answer book. This question is worth 10 marks.

Section B consists of three questions, namely questions 2, 3 and 4. Each of these questions is worth 30 marks. **You have to select any <u>two</u> (2) questions** and answer them for a subtotal of 60 marks.

Sections A and B together count 70 marks.

SECTION A

QUESTION 1 ANSWER ALL THE QUESTIONS IN THIS SECTION — 10 marks

SECTION B:

QUESTIONS 2, 3 and 4 SELECT **<u>ANY TWO</u>** (2) OF THE THREE (3) QUESTIONS — <u>60 marks</u>

<u>70 marks</u>

[TURN OVER]

SECTION A

ANSWER EACH OF THESE QUESTIONS IN THE BLOCK PROVIDED. ANSWER ALL TEN QUESTIONS.

QUESTION 1

1 1 Which of the following always forms part of the core functions of any organisation?

a marketing (which includes sales)

b service or product development

c operations

d exports

e BEE (black economic empowerment)

1 a

2 a, b

3 a, b, c

4 a, b, c, d

5 a, b, c, d, e

Answer.

1 2 Operations strategy perspective(s) encapsulate(s) the following

1 Operations strategy is a top-down reflection of what the whole group or business wants to do

2 Operations strategy is a bottom-up reflection of what the whole group or business wants to do

3 Operations strategy involves translating market requirements into operations decisions

4 Operations strategy involves exploiting the capabilities of operations resources in chosen markets

5 Operations strategy is ad hoc by nature and does not necessarily align to the corporate strategy of the company

1 a

2 a, b

3 a, b, c

4 a, b, c, d

5 a, b, c, d, e

Answer

1 3 Mhlango and Nkosi (Pty) Ltd manufactures optic fibre that is subjected to a bend test They use statistical process control (SPC) and the results (measured in grams) are plotted on a chart If the process average is 26 1 and the average range is 5, what will the upper control limit (UCL) be if the sample size n = 8? The factor for the calculation of the control limits is 0 37 for sample size n = 8 (number of observations) (see the table below)

Number of Observations in Subgroup N	Factor for $\bar{X}$ Chart A2
2	1 88
3	1.02
4	0 73
5	0.58
6	0.48
7	0 42
8	0.37
9	0.34
10	0.31

What is the **correct** upper control limit (UCL)?

1 UCL = control limit. X + A2R = 26 1 + 0.37 x 5 = 27 95
2 UCL = control limit· X – A2R = 26 1 – 0 37 x 5 = 24.25
3 UCL = control limit X + A2R = 26 1 + 0.37 x 5 = 132 35
4 UCL = control limit· X + A2R = 26 1 – 0 37 x 5 = 128 65
5 UCL = control limit X + A2R = 26 1 + 0 37 x 8 = 211 76

Answer

1 4 Which of the following fundamentals should be taken in consideration for environmentally sensitive process design?

a the source of inputs to a product or service
b qualities and sources of energy consumed in the process
c the amounts and types of waste material that are created in the manufacturing processes
d the life of the product itself
e the end-of-life of the product

1 a
2 a, b
3 a, b, c
4 a, b, c, d
5 a, b, c, d, e

Answer·

1 5 Process types describe a particular general approach to managing processes

Which **three (3)** of the following are defined as service process types?

a professional services
b jobbing services
c service shops
d continuous services
e mass services

1 a, b, c
2 b, c, d
3 c, d, e
4 a, c, e
5 a, b, e

Answer:

1 6 What is/are the performance objective(s) of operations management?

a cost
b speed
c quality
d flexibility
e dependability

1 a
2 a, b
3 a, b, c
4 a, b, c, d
5 a, b, c, d, e

Answer

1 7 Regarding total quality management (TQM), which of the following is **correct**?

a TQM takes an organisation-wide perspective.
b TQM puts customers at the forefront of quality decision-making.
c TQM holds that all parts of the organisation have the potential to contribute to quality
d TQM is a very important concept in production and operations management
e TQM discourages the balance between different types of quality cost.

1 a
2 a, b
3 a, b, c
4 a, b, c, d
5 a, b, c, d, e

Answer.

1 8 Operations managers should understand enough about process technology to evaluate alternatives. Which of the following key questions can assist operations managers to grasp the essentials of the technology?

a What does the technology do?
b How does it do it?
c What benefits does it give?
d. What constraints or risks does it impose?
e Is it the latest and most fashionable technology?

1 a
2 a, b
3 a, b, c
4 a, b, c, d
5 a, b, c, d, e

Answer:

1 9 Material requirements planning (MRP) is used to plan and control material requirements. The master production schedule (MPS) is given in the table below. Batches are ordered in quantities of 30 The minimum stock level should be 10 Available stock = 60 Order lead time = 2 weeks.

	Weeks					
	0	*1*	*2*	*3*	*4*	*5*
Gross required		*36*	*8*	*26*	*18*	*26*
Available inventory	*60*					
Planned order						

The **first** planned order is in·

1 week 1
2 week 2
3 week 3
4 week 4
5 week 5

Answer:

1 10 Which of the following actions will be the most relevant for the production and operations manager to choose new process technology?

a market requirements evaluation
b operations resource assessment
c financial evaluation
d Gantt chart evaluation
e assessment of the most expensive technology with the maximum value

1 a

2 a, b

3 a, b, c

4 a, b, c, d

5 a, b, c, d, e

Answer

[10]

SECTION B

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

QUESTION 2

2 1 As the production and operations manager of Neo Africa Development (Pty) Ltd in Johannesburg, you are the mentor to a new intern at a manufacturing plant. Identify and demonstrate to the intern what the basic performance objectives for production/operations management at your company entail.

(5)

2.2 Just-in-time (JIT) is a method of planning and control and an operations philosophy that aims to meet demand instantaneously, with perfect quality and no waste Identify **three (3)** advantages {3 marks} and **one (1)** disadvantage {1 mark} of a car manufacturing plant operating according to the just-in-time (JIT) philosophy.

(4)

2 3 The inventory record (item master file) for screwdriver handles shows the following planning factors. batches are set at quantities of 25, safety stock is set at 5 handles, the available inventory is 90 and the lead time for orders is 2 weeks When will the first and second order be issued (i.e in which week) and what will the available inventory in week 5 be (i e the quantity of items)?

(7)

Item	Week				
	1	2	3	4	5
2 mm	11			10	
7 mm	18		16		18
Star 5	8	20	8	6	2
MPS	37	20	24	16	20

Populate the table below:

	Week					
	0	1	2	3	4	5
Gross required		37	20	24	16	20
Available inventory	90					
Planned order						

2 4 Many methods and techniques can be used to improve operations management Select and clarify **four (4)** techniques that can be used to improve quality management.

(4)

2 5 Planning and control is crucial within production and operations management

2 5.1 Define planning and control {2 marks}

2 5.2 Select and apply the four distinct activities of planning and control {8 marks}

(10)

[30]

QUESTION 3

3 1 The PDCA cycle or Deming cycle is an operations improvement principle. Interpret the **four (4)** stages of the Deming cycle

(4)

3 2 New Africa Engineering (Pty) Ltd is implementing a project with the activities indicated in the table below

Draw a critical path method (CPM) network and determine the ES, EF, LS and LF for activities E, F and G

Activity	Duration of activity (days)	Immediate followers
A	10	B, C, D
B	2	E
C	6	F
D	6	G
E	2	F
F	10	H
G	2	H, I
H	2	I
I	2	J
J	2	-

(6)

3 3 During the transformation process (of production and operations management), resources are treated, transformed or converted in any process Interpret **three (3)** transformed resources and explain what their transformation entails.

(6)

3 4 The product/service life cycle is a generalised model of the behaviour of both customers and competitors during the life of a product or service It is generally considered to have four stages Interpret the **four (4)** stages and explain each one

(4)

3 5 Different process designs are applicable to different circumstances within production and operations management. Identify **five (5)** process designs and interpret what each means.

(10)

[30]

QUESTION 4

4 1 Total productive maintenance (TPM) is important in production and operations management. TPM is carried out by all employees, it recognises the importance of reliability, maintenance and economic efficiency in plant design What are the **five (5)** goals of TPM?

(5)

4 2 Within production and operations management, planning and control require the reconciliation of supply and demand in terms of volumes, timing and quality Identify at least **three (3)** planning and control activities that will be performed in a furniture manufacturing plant.

(3)

4 3 Production and operations management decisions are affected by globalisation The ethical globalisation movement seeks to reconcile the globalisation trend with how it affects societies. What are the **four (4)** aims of ethical globalisation?

(4)

4.4 ABS (Pty) Ltd manufactures needles that are subjected to a bend test. The company uses statistical process control (SPC) and the results (measured in grams) are plotted on a chart.

4 4 1 If the process average is 26,1 and the average range is 4, what will the control limits be if the sample size is n = 9? The factor for the calculation of the control limits is 0,34 for sample size n = 9

{4}

4 4 2 Interpret whether an investigation into an assignable cause should be undertaken, given that one sample average is 26,08

{1}

(5)

4 5 Corporate social responsibility (CSR) is defined as the business contribution to sustainable development goals. CSR should be a factor in every organisation's production and operations activities CSR involves **five (5)** important dimensions. Identify and apply each of these **five (5)** dimensions.

(10)

4 6 Identify the **three (3)** core functions of any organisation

(3)

[30]

2 x 30 marks = 60

TOTAL: 70

ADDITIONAL PAGES

Should you find that the space provided after the questions is insufficient, please **number** your answer to each question clearly and continue with your answers on the following pages

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