FINAL %	

UNISA university of south africa

MNO3701

OCTOBER / NOVEMBER 2017

PRODUCTION AND OPERATIONS MANAGEMENT

STUDENT NUMBER									

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FOR USE BY EXAMINATION INVIGILATOR

Question no	Marks					
	Examiners					
	1			2		
Q1						
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Q3						
Q4						
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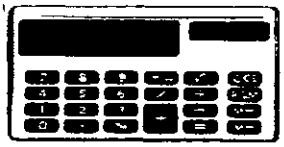

UNIVERSITEITSEKSAMENS

UNISA university of south africa

MNO3701

October/November 2017

PRODUCTION AND OPERATIONS MANAGEMENT

Duration 2 Hours

70 Marks

EXAMINERS :

FIRST	DR AS TOLMAY
SECOND	MR R DIRKSE VAN SCHALKWYK
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

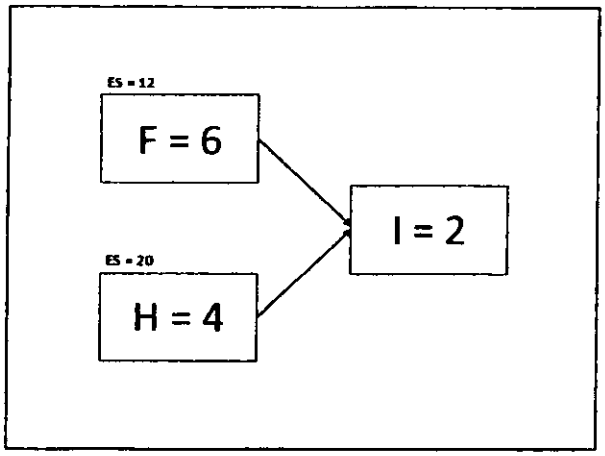
1 1 The durations of the following three activities on the activity-on-node (AoN) diagram are

Activity F = 6

Activity H = 4

Activity I = 2 (last activity)

The early start for F is 12 and that for H is 20 (see diagram below)



What are the Late Start (LS) and Late Finish (LF) of activity H?

1 LS = 14, LF = 18

2 LS = 20, LF = 4

3 LS = 4, LF = 0

4 LS = 8, LF = 0

5 LS = 20, LF = 24

Answer

1 2 Referring to the AoN diagram in question 1 1, what is the slack on activity F?

1 slack for activity F = 12

2 slack for activity F = 6

3 slack for activity F = 0

4 slack for activity F = 18

5 slack for activity F = 24

Answer

1 3 New Era technologies (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 **three (3)** of the following statements are **correct**?

a All operations of all types of businesses produce goods or render services, or a mixture of the two, by a process of transformation
b Transformed input resources comprise the following materials, information and customers/clients
c The difference between transforming and transformed input resources lies in their position in relation to the output resources
d A dominant transformed-material resource, such as a factory plant, would be found in all types of manufacturing operations
e After having gone through materials, information or customer processing, outputs emerge in the form of goods or services, which are generally different because of tangibility, storability, transportability and customer/ client contact

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

Answer

15 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

16 ISO 14000 is an international standard that guides environmental management systems and covers initial planning, implementation and objective assessment
Which of the following is/are (a) requirement(s) included in ISO 14000?

a a commitment by top-level management to environmental management
b the development and communication of an environmental policy
c the establishment of the relevant legal and regulatory requirements
d the setting of environmental objectives and targets
e regular monitoring and measurement of all operational activities

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

Answer

17 Regarding TQM, which **one (1)** of the following options is **incorrect**?

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

Answer

18 Which of the following options does/do **not** represent cost/costs associated with quality in operations management?

a opportunity cost
b prevention cost
c appraisal cost
d internal failure cost
e external failure cost

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 20 The minimum stock level should be 5 Available stock = 70 Order lead time = 2 weeks

	Weeks					
	0	*1*	*2*	*3*	*4*	*5*
Gross required		*36*	*8*	*26*	*18*	*26*
Available inventory	*70*					
Planned order						

The **second** 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 AJH Nkosi (Pty) Ltd in Tshwane, you are the mentor to a new intern at a manufacturing plant Identify and explain 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 Explain **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 low

	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 Identify and explain **four (4)** techniques that can be used to improve quality management

(4)

2 5 Explain the concept of "totality" in TQM (total quality management) {3 marks} and provide the seven (7) fundamentals of the TQM approach {7 marks}

(10)

[30]

QUESTION 3

3 1 You are the production and operations manager of your company To compile a marketing brochure for your company, you have to explain total productive maintenance to the marketing manager How will you explain what the goals of **total productive maintenance** (TPM) are {3 marks}? How does TPM differ from reliability-centred maintenance (RCM) {1 mark}?

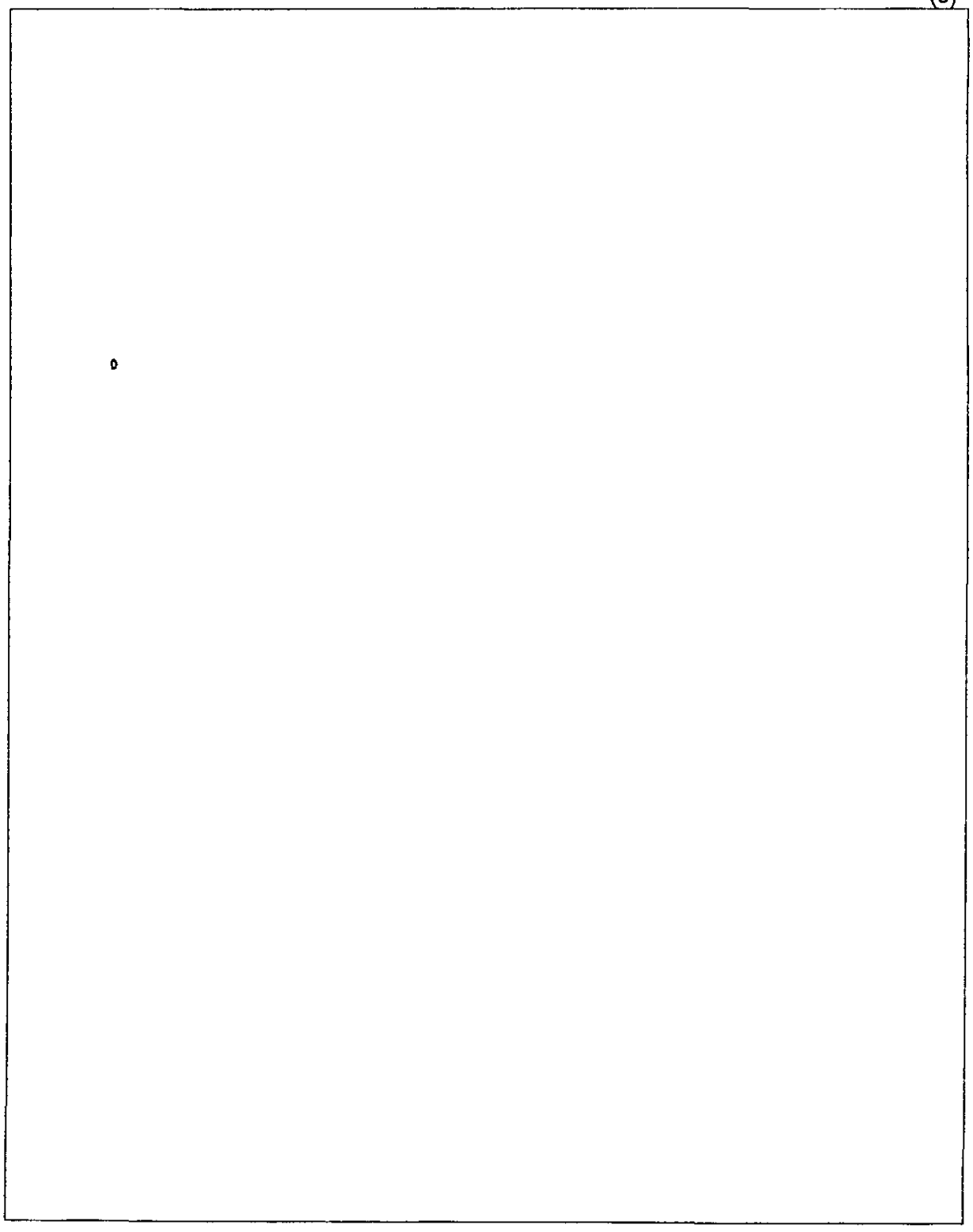
(4)

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 Identify **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 Identify the **four (4)** stages and explain each one

(4)

3 5 Explain the following with reference to quality planning and control

3 5 1 The transcendent approach to quality {2 marks}
3 5 2 The manufacturing-based approach to quality {2 marks}
3 5 3 The user-based approach to quality {1 mark}
3 5 4 How to ensure conformance to specifications {5 marks}

(10)

[30]

QUESTION 4

4 1 "Failures are rarely the result of random chance, their root cause is usually human failure " Define the term "customer failure" {2 marks} and identify and explain the **three (3)** main methods used to measure failure {3 marks}

(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 and explain 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 Identify and explain 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 Explain whether an investigation into an assignable cause should be undertaken, given that one sample average is 26,08

{1}

(5)

4 5 What do the "modern" operational challenges facing production/operations managers in the year 2017 entail? {2 marks} How would you recommend these POM challenges or issues be dealt with effectively, given the increasingly competitive markets? {8 marks}

(10)

4 6 Name 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** each question clearly and continue with your answers on the following pages

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