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MNO2601

MAY/JUNE 2017

PRODUCTION AND OPERATIONS MANAGEMENT II

STUDENT NUMBER

IDENTITY NUMBER

Question No	Marks		
	Examiners		
	1	2	3
A1			
B2			
B3			
B4			
Total			

Number of paper

Date of examination

Examination centre

MNO2601

May/June 2017

PRODUCTION AND OPERATIONS MANAGEMENT

Duration 2 Hours 70 Marks

EXAMINERS
FIRST MRS AP AMADI-ECHENDU
SECOND MR JV DE VILLIERS

Use of a non-programmable pocket calculator is permissible

Closed book examination.

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The paper consists of 18 pages

Make sure that the following information appears on the cover of your answer book
• Your student number
• ID number
• Date and exam centre

This examination paper consists of two sections Section A contains 10 multiple-choice questions which count only one mark each Section B consists of 3 essay-type questions of 30 marks each of which the student has to <u>select any two</u> questions Section A and B together thus count 70 marks

SECTION A ALL STUDENTS MUST ANSWER THIS SECTION **IN ANSWER BOOK** 10 Marks

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

TOTAL 70 Marks

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

[TURN OVER]

SECTION A

Please **complete in the answer book** and **not** on a mark reading sheet

QUESTION 1

1 1 Operations management is an important function of a business entity Choose the correct option

1   Operations management is the activity of managing the resources which are devoted to the three of core functions in the organisation

2   Operations management is not a core function of an organisation and may not be called operations management in some industries

3   Operations management is concerned with managing the transformation process

4   Operations management has relevance for operations managers only

Answer:

1 2 Operations management can use the idea of the input-transformation-output model to analyse business at three levels Choose the incorrect option

1   All operations can be modelled as input-transformation-output processes

2   Few operations produce only products or only services

3   All operations are part of a larger supply network

4.   'End-to-end' business processes that satisfy customer needs exist only within the operations function

Answer:

1 3 Operations require a tightly defined set of five basic performance objectives which relate specifically to the task of satisfying customer requirements Choose the correct option

1   Quality could mean that all products or services are made to specification

2   Dependability could mean the ability to adjust volume flexibility

3   Flexibility could mean reducing technology and facilities costs

4   Speed could mean keeping to appointment times

Answer:

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1 4 In Company A it was decided that the average number of customers should be limited to ten and that the average time that a customer should wait in the process should be four minutes Apply Little's Law and consider the options below Choose the correct option

1   Throughput time = 10 minutes

2   Work in progress = 0 4 minutes

3   Cycle time = 4 minutes

4   The number of servers required = 3

Answer:

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1 5 Choose the incorrect option All products and services can be considered as having the following aspects

1   A concept, i e the nature, use and value of the product/service

2   A storyboard, i e the history behind the idea of the product/service

3   A package, i e the product/service that provides specific benefits previously defined

4   The process, i e the way in which the product/service will be created and delivered

Answer:

1 6 Scientific management took some of the ideas of division of labour and applied them more systematically Choose the correct option

1. Scientific management comprises of the division of labour and method study
2   Method study comprises of work study and work measurement
3   Work measurement comprises of method study and work study
4   Work study comprises of method study and work measurement

Answer:

1 7 The behavioural approach to job design is important Please choose the incorrect option Behavioural models to job design include.

1   job enrichment
2. work study
3   empowerment
4   teamworking

Answer:

1.8 Planning and control requires the reconciliation of supply and demand of volumes, timing and quality Please choose the correct option

1   Scheduling is the amount of work that is allocated to a work centre
2   Sequencing is the order in which the work will be tackled
3   Loading requires a timetable showing at what time or date jobs should start and when they should end.
4   Monitoring and control involves starting jobs at the last possible moment to prevent them from being late

Answer:

1 9 With an understanding of both demand and capacity, the next step is to consider the alternative methods of responding to demand fluctuations There are three options available for coping with demand fluctuations Choose the incorrect option

1   Accommodate the fluctuations by working overtime
2   Ignore the fluctuations and keep activity levels constant
3   Adjust the capacity to reflect the fluctuations in demand
4   Attempt to change demand to fit capacity availability

Answer:

1 10   Inventory is defined as the stored accumulation of material resources in a transformation system Please choose the incorrect option The disadvantages associated with inventory are the following

1   It ties up money which could be used more productively elsewhere
2   It allows the organisation to cope with random or unexpected interruptions in supply or demand
3   There is a decreasing risk of obsolescence, loss, damage and deterioration
4   It takes up space and it must be managed, stored and insured

Answer:

Section A: 10 questions x 1 mark = 10 marks

SECTION B

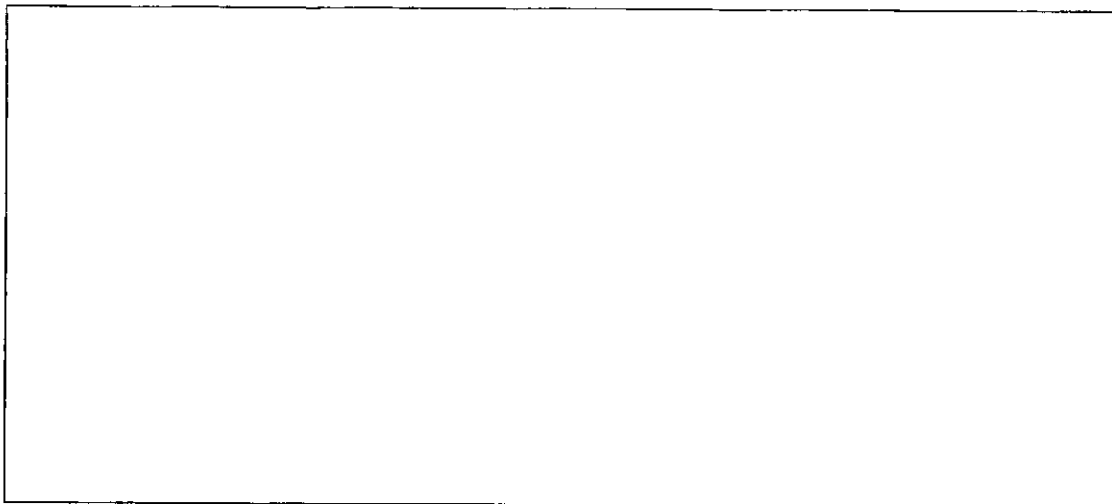**SELECT AND ANSWER ANY TWO (2) OF THE FOLLOWING THREE (3) ESSAY-TYPE QUESTIONS.**

EACH QUESTION COUNTS 30 MARKS.

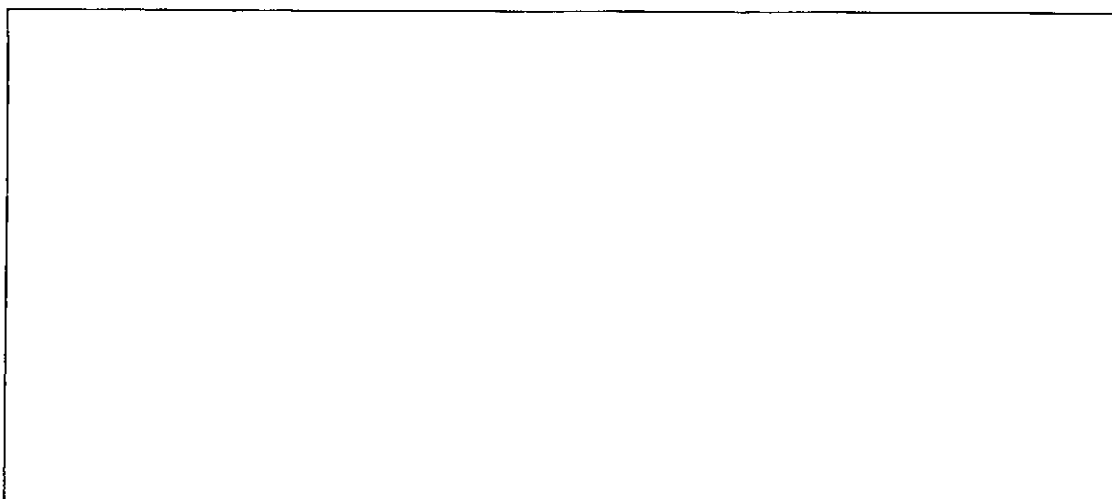**Question 2**

2 1   Illustrate the transformation process by means of a simple process flow sketch using the example of   (8)

    2 1 1   A car manufacturing plant   {4}

    2 1 2   A service provided by Avis car rental   {4}

2 2 A building materials supplier obtains its bagged cement from a single supplier Demand is reasonably constant throughout the year Last year the company sold 2000 tonnes of product It estimates the costs of placing an order at R25 each time an order is placed It calculates the annual cost of holding inventory at 20% of purchase cost The company purchases the cement at R60 per tonne Using the economic order quantity (EOQ), calculate how much the company should order at a time (5)

2 3 The five performance objectives relate specifically to the organisation's basic task of satisfying customer requirements They also apply to all types of operations (10)

2 3 1 Discuss the internal effect of the performance objectives of an organisation {5}

2 3 2 Discuss the external effect of the performance objectives of an organisation {5}

Performance Objective	Internal effect	External effect

2 4 Extending our understanding into the area of macro productivity tells us that productivity is not only about the efficiency with which inputs are used to create outputs, there can and should also be an ultimate benefit to the environment, the economy and society   (7)

2 4 1   Describe the macro perspective of productivity   (2)

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2 4 2   Discuss how macro productivity can be improved in South Africa   (5)

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Question 3

3 1   The layout of an operation is concerned with the physical location of its transforming
resources Describe the aspects which contribute to a good layout   (5)

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3 2   Discuss the unique characteristics of the <u>four</u> basic layout types   (4)

Layout type	Unique characteristics

3 3   Job design should also take into account the desire of individuals to fulfill their needs for self-esteem and personal development. Describe the differences between job rotation, job enlargement, job enrichment, empowerment and teamworking   (5)

	Differences
Job rotation	
Job enlargement	
Job enrichment	

Empowerment	
Teamworking	

3 4 P.D ratios contrast the total length of time customers have to wait between asking for the product or service and receiving it Discuss how the P D ratios differ for 'resource-to-order', 'make-to-order' and 'make-to-stock'? (6)

	Differentiating characteristic
Resource-to-order	
Make-to-order	
Make-to-stock	

3 5 Sequencing activities within planning and control determines the order in which the work is to be performed Discuss five (5) different sequencing rules (5)

Sequencing rule	Differentiating characteristic

3 6   The various reasons for an imbalance between the rates of supply and demand at different points in any operation lead to different types of inventory List any 5 disadvantages of holding inventory   (5)

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Question 4

4 1   General approaches to designing and managing processes are called process types

(10)

4 1 1   Discuss five (5) of the process types (Do not just mention the types)   {5}

4 1 2   Give an example of each of the five process types   (5)

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4 2   Many of the ways of improving productivity lie directly within the responsibility of production and operations management Explain how productivity should be managed and improved within a business, i e micro-productivity   (5)

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4 3   To get to a final design of a product or service, the design activity must pass through
      several key stages   Distinguish between the relevant stages in the design of
      products/services and specify the relevant sequence   (5)

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4 4   A car manufacturer has a painting line with a design capacity of 99 square metres per
      minute The line is operated 24 hours a day, 7 days a week Records for a week show
      the following

1	Product changeovers (setups)	6 hours
2	Regular maintenance	5 hours

3	No work scheduled	12 hours
4	Quality sampling checks	18 hours
5	Shift change times	20 hours
6	Maintenance breakdown	9 hours
7	Quality failure investigation	7 hours
8	Paint stock-outs	14 hours
9	Labour shortages	16 hours
10	Waiting for paint	16 hours
	Total	123 hours

The first five categories of lost production are planned occurrences, while the last five are unplanned occurrences Calculate (please show each step)   (10)

    (a) Design capacity

    (b) Effective capacity

    (c) Actual output

    (d) Utilisation (percentage)

    (e) Efficiency (percentage)

ADDITIONAL PAGES