UNIVERSITY
OF
JOHANNESBURG

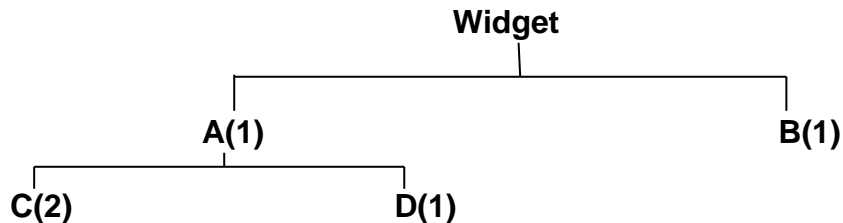| FACULTY/COLLEGE	College of Business and Economics
SCHOOL	Johannesburg Business School
DEPARTMENT	Transport and Supply Chain Management
CAMPUS(ES)	APK
MODULE NAME	Logistics Management Systems B
MODULE CODE	LMS23B3
SEMESTER	Second
ASSESSMENT OPPORTUNITY MONTH AND YEAR	SSAO January 2020

ASSESSMENT DATE	06 January 2020	SESSION	11:30 14:30
ASSESSOR(S)	Dr S Carstens		
MODERATOR(S)	Internal: Prof J Walters External: Dr K Lambert		
DURATION	3 hours (180 min)	TOTAL MARKS	180

NUMBER OF PAGES OF QUESTION PAPER (Including cover page)	4

INFORMATION/INSTRUCTIONS:
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- This is a closed-book assessment.
- There are 4 questions.
- Answer each question in a separate book.
- Read the questions carefully and answer only what is required.
- Number your answers clearly and correctly as per the question paper.
- Write neatly and legibly on both sides of the paper in the answer book, starting on the first page.
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The SA Widget Company (SAWC) manufactures a line of widgets at their plant in Johannesburg. They operate a national distribution network and supply widgets from four distribution centres (DCs) to various retailers in South Africa from. The widget product structure is as follows:

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                          Widget
          ┌─────────────────┴─────────────────┐
        A(1)                                 B(1)
    ┌─────┴─────┐
  C(2)         D(1)
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The components are supplied by various suppliers in South Africa and the respective number of components for each widget is indicated in brackets in the product structure.

As a result of the poor economic conditions, SAWC has initiated various cost saving projects. In addition, the increasing level of competitiveness in the widget market has led to higher levels of demand variability. Management has identified logistics as an area for potential cost reductions.

SAWC has implemented an inventory control system that is integrated with their enterprise resource planning (ERP) system. Information is shared nationally since the regional offices are linked with head office through the ERP system. However, the logistic manager has suggested that the implementation of suitable information technologies should be investigated to reduce costs and increase service levels in the competitive market.

SAWC is also reviewing their current logistics network since they are using their own vehicle fleet for plant to DC, as well as DC to customer deliveries and it is believed that the network impacts negatively on transport costs and customer service levels. To this end the following plant (Johannesburg) and major DC map coordinates are available:

	X	Y
Manufacturing plant	6.5	4.0
DC1	7.0	6.5
DC2	9.0	4.0
DC3	1.5	1.0
DC4	6.0	1.2

∗ **Each map coordinate = 180 km**

QUESTION 1   (49 MARKS)

1.1   SAWC has implemented an ERP system to improve the sharing of information. Discuss the ERP modules that allow the company to achieve sharing of information.   (15)

1.2   Do you think that an Advanced Planning System (APS) will increase the efficiency in the SAWC supply chain? Motivate your answer by referring to the benefits of APS.   (9)

1.3   Although the sharing of information is very important for optimal supply chain performance, the quality aspect of information needs to be addressed. What would your advice to SAWC be in terms of information requirements?   (10)

1.4 The supply chain is characterised by technology innovations. Discuss RFID, adaptive supply chain networks and pervasive automation as examples of these innovations. (15)

QUESTION 2 **(32 MARKS)**
2.1 Explain the role of inventory to assist management in the formulation of an inventory strategy. (15)
2.2 SAWC orders component B from a local supplier at a cost of R100/unit. The supplier has offered a discount of 4% on orders greater than 500 units. Should the company consider this offer?

Assume the following additional information:
Annual order   3600 units
Order cost   R200
Inventory carrying cost   25%
Note: Assume 360 days/annum. (17)

QUESTION 3 **(47 MARKS)**
3.1 Discuss the objectives and inputs of a MRP system to explain how the company could increase the effectiveness of material management. (11)
3.2 SAWC currently orders component A from the supplier with no lot sizing (lead time = 2 weeks). The planned order releases associated with the gross requirements for a specific period is shown below:

Component A		Weeks				
	PD	1	2	3	4	5
Gross requirements		20	30	50	50	60
Scheduled receipts			50			
Projected on hand	40	20	40	0	0	0
Net requirements				10	50	60
Scheduled order receipts				10	50	60
Scheduled order releases		10	50	60		

However, the supplier has indicated that a minimum lot size of 50 units is considered. Use the above information to illustrate the impact on inventory of such a change in order quantity. (14)
3.3 Distribution plays a significant role SAWCs supply chain. Explain how the implementation of a DRP system may benefit logistics. (7)
3.4 The successful implementation of DRP and MRP systems rely on accurate forecasts and consistent lead times. However, this may not be achievable in practice. Explain how demand driven MRP (DDMRP) may solve these issues by briefly describe a five-point plan for DDMRP development. (15)

QUESTION 4 **(52 MARKS)**
4.1 Assist the company to calculate the annual transport cost associated with the current network if the following transport rates apply:

Route	Volume (Number of widgets)	Cost (Rand/widget/km)
Plant – DC1	1250	1.90
Plant – DC2	850	2.50
Plant – DC3	950	4.15
Plant – DC4	550	3.75

The area in which the plant is situated is not suitable anymore and the company has decided to find an alternative plant location. The logistics manager has identified two potential locations. Suppose the following site evaluation information is available:

Factors	Weight	Scores (0 – 100)	
		Site 1	Site 2
Labour	0.35	70	90
Transportation	0.25	60	80
Infrastructure	0.20	80	50
Space for expansion	0.15	60	60
Quality of life	0.05	80	95

Which of these two sites is more suitable? (18)

4.2 Describe the economic benefits of warehouses. (10)

4.3 Discuss the benefits of implementing warehouse management systems (WMS). (8)

4.4 Explain which guideline principles SAWC can apply to develop good vehicle routes and schedules to reduce transport cost. (16)

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