



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	FSAO 12 November 2019

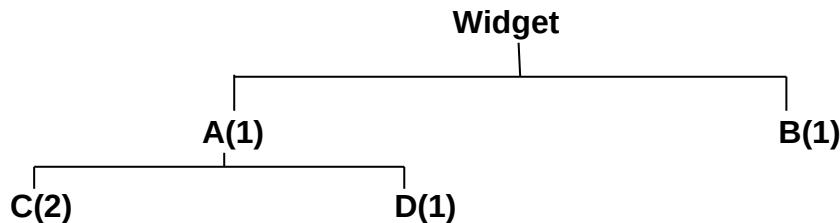
ASSESSMENT DATE	12 November 2019	SESSION	12:30 – 15:30
ASSESSOR(S)	Dr S Carstens		
MODERATOR(S)	Internal: Prof J Walters External: Dr K Lambert		
DURATION	3 hours (180 min)	TOTAL MARKS	180

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



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
Johannesburg DC	7.0	6.5
Durban DC	9.0	4.0
Cape Town DC	1.5	1.0
Port Elizabeth DC	6.0	1.2

*** Each map coordinate = 180 km**

QUESTION 1

(54 MARKS)

- 1.1 Which areas do you recommend that the company focus on to achieve supply chain excellence? (12)
- 1.2 Explain which supply chain management software categories should SAWC address to ensure a strong supply chain information systems (SCIS). (12)
- 1.3 Although it is difficult to completely segment the ERP system from the supply chain information system, explain the main differences by referring to the ERP modules and advantages. (16)

- 1.4 Do you think that SAWC could increase supply chain decision making efficiencies by implementing an APS system? (Refer to the planning areas that are addressed by APS, as well as the associated advantages). (14)

QUESTION 2 (33 MARKS)

- 2.1 Discuss the key differences in the approaches to managing inventory. (15)
- 2.2 The widgets to the Durban DC are currently shipped via rail transport. The company's director of logistics has asked the logistics manager to evaluate using road transport (a third party service provider) as an alternative mode of transport to ship the widgets to Durban. The company currently uses the EOQ approach to supply the Durban DC.

The logistics manager has obtained the following information:

Annual demand	250 widgets
Widget value	R4 000
Inventory carrying cost	25%
Order cost	R200
In-transit inventory carrying cost	15%
Transit time (rail)	4 days
Transit time (road)	2 days
Rail rate	R100.00/ton
Road rate (3PL)	R6.26/widget
Unit weight	50 kg/widget
Days/annum	360

Which mode of transport would you recommend that the company use to supply the Durban DC? (18)

QUESTION 3 (53 MARKS)

- 3.1 Describe the positive and negative influences of a MRP system on supply chain management. (17)
- 3.2 SAWC currently uses an MRP system and the following demand information illustrates the demand for the widget for a 5-week period:

Week	0	1	2	3	4	5
Gross requirements		100	50	100	180	200

These demand requirements and the associated production information (a scheduled receipt of 50 widgets in week 3, a production quantity (lot size) of 200 widgets and a production lead time of 2 weeks) results in the following planned order releases for this planning period:

Week	0	1	2	3	4	5
Planned order releases		200	200	200		

How will the planned order releases change if the lead time can be reduced to 1 week? (14)

- 3.3 Explain how the marketing function may benefit from the implementation of a DRP system. (10)

- 3.4 The DRP system relies on forecasts which are subject to variable demand situations. However, demand driven MRP (DDMRP) buffers may address this issue. Which considerations should SAWC take into account in terms of the lead time decoupling point placement? (12)

QUESTION 4 (40 MARKS)

- 4.1 SAWC has analysed their current plant to DC transport cost and believes that the plant location has a negative impact on the transport costs. To this end management has identified an alternative plant location as shown below.

	X	Y
New plant location	6	2

The volumes transported from the plant to the DCs are as follows:

Distribution centre	Number of widgets
Johannesburg DC	350
Durban DC	250
Cape Town DC	250
Port Elizabeth DC	150

Does the new plant location reduce the DC supply costs at the following transport rates? (The DC supply cost associated with the existing location is R1 963 341).

Route	Transport rate (Rand/widget/km)
Plant - Johannesburg DC	1.90
Plant - Durban DC	2.50
Plant - Cape Town DC	4.15
Plant - Port Elizabeth DC	3.75

- Use the centre-of-gravity method to establish which of the two locations has the lowest transport cost associated with it. (18)
- 4.2 Even though the warehousing cost was identified as being high, warehousing has certain benefits. Explain the economic needs of warehousing. (12)
- 4.3 Explain the principles of a good routing and scheduling procedure. (10)

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