UNIVERSITY OF JOHANNESBURG

MODULE	:	**LOGISTICS MANAGEMENT SYSTEMS B**
CODE	:	**LBS3B01/LMS23B3**
DATE	:	**01 DECEMBER 2016**
DURATION	:	**180 MINUTES**
TOTAL MARKS	:	**180**

EXAMINER	:	**DR S CARSTENS**
MODERATOR	:	**DR K LAMBERT**
NUMBER OF PAGES	:	**4 PAGES**

INSTRUCTIONS TO CANDIDATES:

- Question papers must be handed in.
- This is a closed book assessment.
- Read the questions carefully and answer only what is asked.
- Number your answers clearly.
- Write neatly and legibly
- Structure your answers by using appropriate headings and sub-headings.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.
- Answer each section on a different answer sheet.

PLEASE ANSWER ALL THE QUESTIONS.

Lion Tyres (LT) is a tyre manufacturer in Port Elizabeth, South Africa and distributes tyres to distribution centres (DCs) nationally which includes DCs in Johannesburg, Durban, Cape Town and Port Elizabeth, as well as smaller local warehouses. The components used in the manufacturing process are supplied by local suppliers, as well as international suppliers.

As a result of the tight economic conditions, LT has identified production and supply chain, including logistics, as potential areas for cost savings. Specific areas related to the logistics function include inventory, warehousing and transport. Although, demand variability increases the complexity of the supply chain, the competitive tyre market in South Africa requires LT to maintain high levels of customer service. In the light of these external pressures on the company, LT is also investigating different areas of improvement inter alia, the implementation of suitable information technologies.

In addition, LT is reviewing their current logistics network since they are using their own vehicle fleet for plant to DC, as well as DC to customer deliveries. To this end the following plant (PE) and major DC map coordinates are available:

	X	Y
Manufacturing plant (PE)	6.5	4
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**

LT believes that the network impacts negatively on transport costs and customer service levels.

QUESTION 1 **(28 MARKS)**

a) In your opinion, on which areas (drivers of excellence) should LT focus to ensure a coordinated and responsive supply chain? (12)

b) Do you think that a supply chain information system (SCIS) will assist LT to achieve optimal management of their supply chain? Explain the 4 basic supply chain software solution categories. (16)

QUESTION 2 **(60 MARKS)**

a) How would you describe the demand for tyres: dependent or independent? Explain how the approach to managing inventory varies between products with dependent and independent demand. (10)

b) One of the local suppliers that supply a component for a specific tyre has approached LT with the following proposal:

New transport rate	R2/unit with a minimum of 400 units
Transit time	6 days

The information associated with the status quo is as follows:

Annual orders	3600 units
Order cost	R200
Value per unit	R100
Inventory carrying cost	25%
Transit time	8 days
Transport rate	R3/unit
In-transit carrying cost	10%

Would you recommend that LT accept this proposal?
Note: Assume 360 days/annum. (16)

c) Explain to LT how the company could benefit by the implementation of a MRP system by discussing the associated positive influences. Also ensure that LT management is aware of potential disadvantages of MRP by explaining the negative influences and the weaknesses of the MRP system. (20)

d) Use the following information to illustrate the logic of the MRP process by completing a MRP matrix for tyre X:

Lead time	2 weeks
On-hand inventory	40 units
Scheduled receipt	50, period 2
Safety stock	20 units

Assume the following demand quantities:

Tyre X demand	Week				
	1	2	3	4	5
Gross requirements	20	30	50	50	60

Use the following format:

Tyre X	Week					
	PD	1	2	3	4	5
Gross requirements						
Scheduled receipts						
Projected on hand						
Net requirements						
Scheduled order receipts						
Scheduled order releases						

(8)

e) If LT experience significant demand and supply lead time variability would you recommend that they implement demand driven MRP (DDMRP)? Answer this question by briefly explaining the benefits of DDMRP. (6)

QUESTION 3 (48 MARKS)

a) LT has analysed their current plant to DC transport costs and believes that the plant location has a negative impact on the transport costs. To this end management has identified an alternative plant location in the Port Elizabeth area as shown below.

	X	Y
New plant location	6	2

The volume (%) transported from the plant to the DCs are as follows:

Distribution centre	Volume of production
Johannesburg DC	35%
Durban DC	25%
Cape Town DC	25%
Port Elizabeth DC	15%

Does the new plant location reduce the DC supply costs at the following transport rates?

Route	Cost (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

Would the centre-of-gravity method indicate a similar plant location as the new plant? (20)

b) Since LT is using their own vehicle fleet for DC and customer deliveries, which advice relating to optimal routing and scheduling would you give them in terms of customer deliveries? (16)

c) Discuss the reasons why warehousing is required and indicate which of these relate to LT. (12)

QUESTION 4 **(44 MARKS)**

a) An ERP system is a system that will provide LT with the necessary and accurate information flow and consists of various modules. What are the application-oriented modules? (12)

b) Why should LT consider implementing an ERP system (rationale)? (9)

c) Which major difficulties may LT experience with supply chain planning? Explain how APS systems handle these difficulties by referring to the APS components and the associated benefits. (23)

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