UNIVERSITY OF JOHANNESBURG

MODULE	:	**LOGISTICS MANAGEMENT SYSTEMS B**
CODE	:	**LBS3B01/LMS23B3**
DATE	:	**13 NOVEMBER 2015**
DURATION	:	**180 MINUTES**
TIME	:	**3 HOURS**
TOTAL MARKS	:	**180**

EXAMINER	:	**DR S CARSTENS**
MODERATOR	:	**DR K LAMBERT**
NUMBER OF PAGES	:	**5 PAGES**

INSTRUCTIONS TO CANDIDATES:

- Answer all the questions
- 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 ALL THE QUESTIONS

ABC is an international widget manufacturer and has decided to start manufacturing widgets in South Africa. After an extensive market analysis, the company decided to locate the manufacturing plant in Johannesburg and establish a national distribution network with distribution centres (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.

Although ABC considered outsourcing its transport requirements i.e. long-haul from the plant to DC, DC to warehouse and local i.e. warehouse to final customer (retailer), a decision was made that the transport function will be retained in-house. The proposed plant – DC network is as follows:

▲ = DC

◆ = manufacturing plant (note that the Johannesburg DC is adjacent to the plant)

The DC and plant map coordinates are as follows:

	X	Y
Manufacturing plant	7.0	6.5
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

The widget market in South Africa is very competitive and ABC has identified its logistics function as a potential area that could provide them with a competitive advantage. To this end they are considering implementing relevant information systems that will allow them to manage the logistics network optimally.

QUESTION 1 (28 MARKS)

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

b) ABC has identified Sekele's Supplies (SS) as a potential supplier of a specific component required in the manufacturing process. SS has quoted the following price breaks to ABC:

Order quantity	Purchase price/widget	Transport rate/widget
200	R10.00	R2.50
300	R10.00	R1.50

Use the following additional information to evaluate the influence of ordering larger volumes at the reduced transport rates:

Expected annual sales	1000 units
Order cost	R20
Inventory carrying cost/unit (Assume 360 days/annum)	R3/year

How do the costs associated with these order quantities compare to the cost of the EOQ (assume a transport rate of R2.75 for quantities below 200)? (18)

QUESTION 2 (56 MARKS)

a) If ABC is concerned about managing their inbound inventories (raw materials, components, parts, etc.) which information system can they use? Explain your answer by referring to the benefits of such a system. (12)

b) If ABC is concerned about managing their outbound inventories (finished goods), which information system can they use? Explain your answer by referring to the benefits of such a system. (12)

c) Illustrate the impact of the order process on the planned orders for item X (one/widget) by completing a MRP matrix for each order process:

Order process 1:

Lot size	Minimum 50 units
Lead time	2 periods
On-hand inventory	40 units
Scheduled receipt	50, period 2

Order process 2:

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

Assume the following demand quantities:

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

Use the following format:

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

(32)

QUESTION 3 **(20 MARKS)**

Although ABC has identified the location of its manufacturing plant in Johannesburg, they are not sure that this location is optimal with regards to the DCs. To this end management has identified two alternative locations (L_1, and L_2). The company has evaluated each potential site in terms of a number of important factors. The table below shows the evaluation of these sites, as well as the current site in terms of these factors (scores), as well as the importance of each factor (weight).

Site evaluation

Factors	Scores (0 - 100)			
	Weight	L_1	L_2	Current
Labour laws	0.30	70	90	81
Labour skills	0.20	60	80	78
Transportation	0.20	80	50	67
Infrastructure	0.15	60	60	57
Space for expansion	0.10	80	95	85
Quality of life	0.05	75	65	88

In addition, ABC has established the following co-ordinates of the potential plant sites:

	X	Y
L1	8	6
L2	6.5	5

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%

Do you think that any one of the two locations is better than the current plant location?

QUESTION 4 **(33 MARKS)**

a) ABC intends to perform transport in-house and can expect a number of potential problems. Explain the types of routing problems that ABC may experience, and discuss the principles of optimal vehicle routing and scheduling. (22)

b) As a result of their distribution network (DCs and warehouses) ABC intends to implement a warehouse management system (WMS). However, the suppliers of WMS in general make claims regarding the benefits of implementing a WMS. Compare these claims with the real benefits of a WMS implementation. (11)

QUESTION5 **(43 MARKS)**

Effective information management can help ensure that ABC meets the logistics needs of its customers.

a) In the search for information technologies that may lead to effective information management companies face a number of challenges. Discuss the considerations that are relevant to the process of adapting to new information technologies. How would you suggest that a company deal with the importance of information management? (18)

b) An ERP system is a system that will provide ABC with the necessary and accurate information flow. Discuss the rationale for implementing ERP systems and discuss the benefits of implementing ERP systems. (12)

c) Discuss the major difficulties with planning and discuss how APS systems handle these difficulties by referring to the factors that drive APS developments and implementation. (13)

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