



Faculty of Management and Social Sciences
Department of Logistics & Transport
BSc Hons in Logistics and Transportation
Course CODE: COM551

Year 4 Semester I

REPEAT EXAMINATION

Modelling in Transport and Logistics – LTML4202

- This paper consists of SEVEN (07) questions on SIX (06) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.06.11

Pass mark: 50%

Time: 02 Hours

Question 01: (Compulsory)

- (a) State the four (04) types of travel movement and briefly describe each with an example using graphical representation. (05 Marks)
- (b) Briefly describe the three (03) elements of a transport system. (06 Marks)
- (c) Define the following terminologies commonly used in transport data analysis
- I. Study Area
 - II. Data
 - III. Sample



Faculty of Management and Social Sciences
 Department of Logistics & Transport
 BSc Hons in Logistics and Transportation
 Course CODE: COM551

IV. Population

(04 Marks)

- (d) Briefly describe the closed system in aggregate demand modelling (05 Marks)
- (e) Describe the instance for the equilibrium that could happen for demand and supply for transport. (05 Marks)

Question 02

- (a) "Transport has a direct impact for a country's economy"
 Critically comment on the above statement elaborating on the current context of Sri Lanka, while drawing examples on the economic crisis (10 Marks)
- (b) Critically differentiate Strategic, Tactical and Operational levels of transport planning and how each level of planning is used to improve transport in a system approach (15 Marks)

Question 03

- (a) State three (03) factors affecting trip generation of a manufacturing plant (03 Marks)
- (b) Assume there are three transport zones (Z_i) named A, B and C. The following table 3 gives the residential and employed population, number of households, industrial jobs and other jobs in each of these zones. Equations to calculate trip generation (T_{gi}) and attraction (T_{ai}) are as follows:



Faculty of Management and Social Sciences
 Department of Logistics & Transport
 BSc Hons in Logistics and Transportation
 Course CODE: COM551

$$T_{gi} = (1.5 \times R_{Pi}) + (2.5 \times E_{Pi})$$

$$T_{ai} = H_{Hi} + 2.22 \times I_{Ei} + 4.62 \times O_{Ei}$$

Table 3 : Summary of survey Data

	A	B	C	Total
Residential Population (R _{Pi})	15000	18000	20000	53000
Employed Population Residing Inside Zi (E _{Pi})	5000	7000	10000	22000
Households (H _{Hi})	2500	5000	7000	14500
Industrial Employment in Zi (I _{Ei})	5500	8000	7000	20500
Other Employment in Zi (O _{Ei})	500	1000	8000	9500

Derive a trip generation and attraction table using above information. If there is a mismatch between generation and attraction, state the reasons and give a possible solution to balance the trip generation and attraction. (12 Marks)

- (c) Consider the following two peak work trip generation models, for the morning time that is estimated by a linear regression model for the same transport zones mentioned above.

$$Y = 1.7 + (0.16 \times X_1) + (1.78 \times X_2) \quad R^2 = 0.589$$

$$Y = 3.4 + (0.18 \times X_1) + (0.27 \times Z_1) + (0.61 \times Z_2) \quad R^2 = 0.709$$

Where;

Y: Household trips to work in the morning peak hour

X1: Number of workers in the household

X2: Number of cars in the household



Faculty of Management and Social Sciences
 Department of Logistics & Transport
 BSc Hons in Logistics and Transportation
 Course CODE: COM551

- Z1: Dummy variable which takes the value of 1 if the household has one car
 Z2: Dummy variable which takes the value of 1 if the household has two or more cars

For Zone A, if 50% of the households has no cars, 30% has only one car and the rest exactly two cars, estimate the total number of trips generated by the zone using both models. (10 Marks)

Question 04

- (a) Briefly explain the four (04) types of trip movements (04 Marks)
 (b) Explain the three (03) primary rules in a closed system considering trip attraction and generation with equations (08 Marks)
 (c) Explain the importance of travel desire lines in transport modeling and draw desire lines combining both direction for the bellow O-D matrix (08 Marks)

Table 4 : O-D matrix

Origin Zone	Destination Zone				
	A	B	C	D	Total
A		500	1500	3000	5000
B	1500		500	1000	3000
C	1000	2500		1500	5000
D	500	1000	3500		5000
Total	3000	4000	5500	5500	18000



Faculty of Management and Social Sciences
 Department of Logistics & Transport
 BSc Hons in Logistics and Transportation
 Course CODE: COM551

- (d) Briefly explain the pros and cons of growth factor modeling in trip generation.
 (05 Marks)

Question 05

- (a) Briefly describe five main factors affecting transport demand with suitable examples in Sri Lankan context
 (10 Marks)
- (b) Critically evaluate the link between transport and land used patterns using suitable examples
 (15 Marks)

Question 06

- (a) Briefly explain three (03) features of transport models to be taken into consideration while specifying an analytical approach.
 (06 Marks)
- (b) For the purposes of a transport study, the population of a certain area has been classified according to two income categories, and there are only two modes of transport available (car and bus) for the journey to go to work.

Table 6 : Population distribution

	Low income	High income	Total
Bus user	0.45	0.15	0.60
Car user	0.20	0.20	0.40
Total	0.65	0.35	1.00



Faculty of Management and Social Sciences
 Department of Logistics & Transport
 BSc Hons in Logistics and Transportation
 Course CODE: COM551

Considering the population distribution given in the table 6 above, Calculate:

- I. The probability of a low-income traveler using bus when a sample is with 75% low income (LI) and 25% high income (HI) travelers
- II. The probability of a bus user having low income when a sample is of 75% bus users and 25% car users. (06 Marks)
- (c) Describe two (02) types of errors possible in transport modeling. (06 Marks)
- (d) List down and describe two (02) methods used for data collection in transport modeling projects. (07 Marks)

Question 07

Write short notes on any five (05) of the following: (5*05 Marks)

- (a) Traffic congestion in terms of traffic flow and travel time
- (b) Free flow speed, jam density and maximum flow using Greenshields's Traffic Flow model
- (c) Collector distributor network Vs. Point to Pont network
- (d) Central Limit Theorem in sample size estimation
- (e) Quality improvements to public transport systems in Sri Lanka
- (f) Factors effecting restrains to Mobility

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Faculty of Management and Social Sciences
Department of Logistics & Transport
BSc Hons in Logistics and Transportation
Course CODE: COM551



Year 4 Semester I

REPEAT EXAMINATION

Inventory and Warehouse Management – LTIM4203

- This paper consists of SEVEN (07) questions on FOUR (04) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.06.11

Pass mark: 50%

Time: 02 Hours

Question 01 (Compulsory)

- (a) Explain the role and importance of inventory management in the context of supply chain management. (10 Marks)
- (b) ABC Healthcare experienced raw material shortages and the manufacturing operation was significantly challenged with incurring higher operational costs. When the business consultants were assigned to check on the root cause, they identified that the company doesn't follow a proper inventory control mechanism and inventory management systems
- (i) Briefly explain the role of safety stock in inventory management and explain how it is determined.

(05 Marks)

- (ii) Explain the ABC analysis technique in inventory management. How does it help in prioritizing inventory control efforts? (10 Marks)

Question 02

- (a) XYZ (Pvt) Ltd. is a manufacturing company that produces two types of fast-moving consumer goods. Both categories of products have consistently stable demand according to the company's forecasts. Additionally, the company is currently generating significant profits, which enables it to make future capital investments comfortably. Given this context, provide an appropriate type of warehouse ownership for XYZ to meet future customer demands. Justify your answer. (10 Marks)
- (b) XYZ is planning to automate certain warehouse functions in order to improve the business processes. Explain the warehouse automation strategies the company can implement with the objective of achieving business excellence. (10 Marks)
- (c) Discuss the concept of demand forecasting and its role in effective inventory management. (05 Marks)

Question 03

- (a) Describe the concept of lead time in inventory management and discuss its significance. (05 Marks)
- (b) Explain the three key service benefits of warehousing. (15 Marks)
- (c) Briefly explain the purposes of implementing inventory management systems in organizations. (05 Marks)

Question 04

- (a) Discuss on the three basic design considerations of a warehouse. (15 Marks)
- (b) Explain the differences among a perpetual inventory management systems and periodic inventory management systems. (10 Marks)

Question 05

- (a) "RMT" Third-Party Logistics Provider is tasked with managing inventory for multiple clients in a shared warehouse space. Discuss the challenges and considerations associated with multi-client warehouse management and provide strategies for efficient inventory control and client segregation. (10 Marks)
- (b) Briefly explain the importance of implementing warehouse management systems. (05 Marks)
- (c) Explain how RFID technology, barcoding and drone operations can be implemented in a warehouse to improve the warehousing operations. (10 Marks)

Question 06

- (a) Explain the difference between a dedicated warehouse and a shared warehouse. (05 Marks)
- (b) "Delta" is a distribution company that often experience higher levels of order errors and delays associated with order fulfillment. Identify the possible causes for these problems and propose strategies to improve the order accuracy and efficiency in warehousing functions such as order picking, packing, and arranging customer deliveries. (15 Marks)
- (c) Briefly explain Just-in-Time (JIT) inventory management systems by highlighting associated benefits. (05 Marks)

Question 07

Write short notes on any five of the following topics.

(5*5 Marks)

- (a) Economic Order Quantity (EOQ)
- (b) Types of inventory
- (c) Independent and dependent demand associated with a product
- (d) Warehousing functions / processes
- (e) Advantages of setting up a private warehouse
- (f) Key factors to consider when determining the optimal location for a warehouse
- (g) Cross -docking and its advantages in warehouse operations

-----END OF THE QUESTION PAPER-----



Faculty of Management and Social Sciences
Department of Logistics & Transport
BSc Hons in Logistics and Transportation
Course CODE: COM551

Year 4 Semester I

REPEAT EXAMINATION

Strategic Management – LTSM4206

- This paper consists of SEVEN (07) questions on THREE (03) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.06.10

Pass mark: 50%

Time: 02 Hours

Question 01:

You are working as a Planning Manager for a conglomerate that expanded its operations across 05 sectors. You have been approached by the board of directors to analyze each category and comment on future implications.

- Detergent - This market is also maturing with a reducing market growth rate. The company owns the leading detergent brand in the country.
- Biscuit - This is a high-growth market in Sri Lanka that is dominated by two local brands, The Company recently entered this industry by acquiring a small biscuit company.
- Retailing- The overall market growth rate has decreased (low) due to reduced consumption. The company recently acquired the leading supermarket chain in the country.
- Telecommunication - This is one of the fast-growing industries of the country, and the company recently entered this industry with a joint venture with a new foreign firm.

- Toothpaste – Overall market for dental care is increasing and the company owns two leading toothpaste brands in the country.

(a) Select an appropriate portfolio model and place the above SBU's. Comment on the market position of each of these segments. (15 Marks)

(b) Do you think this company has a balanced portfolio? Explain your answer highlighting future implications.

(10 Marks)

(Total 25 Marks)

Question 02

“Most large corporations are diversified today due to many reasons. It considers that diversified companies really perform better than undiversified companies”.

(a) Identify and explain 04 reasons for diversification. (10 Marks)

(b) What are the main limitation of related diversification? Explain 03 main limitations with appropriate examples.

(15 Marks)

(Total 25 Marks)

Question 03

Business strategy is a clear set of plans, actions and goals that outlines how a business will compete in a particular market, or markets, with a product or number of products or services. Strategies can be applied at different levels of the organization.

(a) Explain the different levels of strategy with appropriate examples.

(10 Marks)

(b) What are the different modes of strategic decision making? Explain your answer with example.

(15 Marks)

(Total 25 Marks)

Question 04

(a) What is meant by National Advantage? How it is different from competitive advantage? (10 Marks)

(b) Explain the key determinants of National Advantage (Porter's Diamond Model) with appropriate global examples.

(15 Marks)

(Total 25 marks)

Question 05

"Structure follows strategy". Elaborate this statement with relevant concepts and hypothetical examples of your choice.

(25 Marks)

(Total 25 Marks)

Question 06

Explain the application of Balanced Score Card model to an organization of choice by developing appropriate goals, measures, targets/ KPIs and actions for each perspective.

(25 Marks)

(Total 25 Marks)

Question 07

Critically explain key growth strategies/ options available for a business organization using Ansoff matrix with appropriate examples.

(25 Marks)

(Total 25 Marks)

-----END OF THE QUESTION PAPER-----