

University of Colombo - Sri Lanka
 Faculty of Arts
 Special Degree Examination in Arts (Geography) - Part I
 Second Semester End Examination – 2018/2019
GYG 2232: Locational Models in Geography
Two (02) hours

Answer three (03) questions selecting at least one question from each part.
 Use of calculator is allowed.
 One graph paper will be provided.

Part I

01. i) Briefly explain following concepts.

- a) Locational rent
- b) Constraint functions for resources
- c) Material index
- d) Least cost location
- e) Centrality index
- f) Interaction of two masses

(03 Marks)

ii) Explain the following concepts using diagrams.

- a) Von Thünen's land use model
- b) Hexagonal shape of settlement

(04 Marks)

iii) Explain the relationship between the concepts given in column **A** with the locational models given in column **B** in the following table.

Concepts (A)	Locational models (B)
a) Distance decay	a) Von Thünen's land use model
b) Economic agglomeration	b) Webber's model
c) Locational cost	c) The variable cost model
d) K3 principle	d) Crisaller's model
e) Breaking point	e) Gravity model

(05 Marks)

- iv). a) A farmer has cultivated tomatoes in 1km^2 of the land. His income is Rs 10000.00 and total cost of the production was Rs. 3000.00. He has to spend Rs. 1000.00 for transport of tomatoes to the market. Calculate the possible distance from the market that the tomato cultivation can be carried out profitably.

(03 Marks)

- b) A micro level manufacturing company decided to produce two types of toys, namely A and B to maximize their profit. Table 01 provides the data of the required resources. Using the data provided, construct all the functions to solve this problem.

Table 01: Details of availability of resources for A and B products

Resources	Requirements		Resource availability (weekly)
	Toy A	Toy B	
Materials	240	120	500
Machine hours	10	8	60
Man hours	5	4	20
Net profit (per unit)	60	50	

(02 Marks)

- c) Prepare a matrix to show the interaction between villages and towns based on the data provided in Table 02 and Table 03.

Table 02: Mean distance between villages and towns (in km)

Villages	Towns		
	P	Q	R
A	15	10	12
B	5	14	8
C	12	9	20

Table 03: Population

Villages		Towns	
Names of villages	population	Names of towns	population
A	26,000	P	200,000
B	60,000	Q	450,000
C	410,000	R	5,100,000

(03 Marks)

(Total 20 Marks)

Part II

02. Cost of transportation and cost of materials are highly considered in most of the locational models while physical geographical factors are limited to assumptions. Critically discuss the importance of giving equal attention to physical factors in developing locational models.

(20 marks)

03. Considerable modifications are required in the basic theory of locational models to make them more realistic. Do you agree with this statement? Discuss your answer using appropriate examples.

(20 Marks)

Part III

04. Table 04 provides some imaginary data related to an industry. Answer the following questions using the data provided.

Table 04: Imaginary cost data

Input	Cheapest source	Basic cost of required quantity (Q) (Dollars) (B)	Locational cost per Dollar unit per mile (Dollars) (L)	Locational pull (Slope of space cost gradient) (Dollars per mile) (BL)	Distance between cost Isolines at \$5 intervals (miles) (5/BL)
Material	A	30.00	0.0333		
Labour	B	30.00	0.0333		
Power	C	30.00	0.0333		
Land	None	5.00	Nil		
Marketing	None	5.00	Nil		

- i) Define and calculate the Locational pull of the industry
(03 Marks)
 - ii) Explain the relationship of isotims and isodapanes and prepare the isodapane with the value of 155 using the data provided in Table 04.
(08 Marks)
 - iii) Calculate the cost of least cost location of the industry and explain the difference between least cost location and profitable region.
(04 Marks)
 - iv) Discuss the results obtained in section 4.(ii) and 4.(iii).
(05 Marks)
- (Total 20 Marks)

05. Using data provided in Figure-1, answer the following questions.

- i) Extract the data on service available in different settlements in Figure 1 and prepare a data table.
(03 Marks)
 - ii) Calculate centrality values and centrality indexes using the data table prepared under 5(i).
(08 Marks)
 - iii) Prepare a plan to upgrade the services in each settlement using the results obtained in 5 (ii).
(04 Marks)
 - iv) Assume that you are working as a marketing manager of a real estate company, explain how does the results of 5 (ii) can be used to select the best location to build an apartment complex.
(05 Marks)
- (Total 20 Marks)
