

University of Colombo - Sri Lanka
Faculty of Arts
Special Degree Examination in Arts (Geography) - Part I
Second Semester End Examination – 2016/2017
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 and one drawing paper will be provided.

Part I

01. A) Select the most suitable answers for the following questions.

- i) In Von Thünen's model, one of the key variables of determining agricultural location is;
- (A) Labor cost (B) Benefits of agglomeration of economic (C) Climate
(D) Cost of irrigation (E) Transportation cost
- ii) What is the most important factor in identifying a location for manufacturing plant according to Weber's model of least cost location?
- (A) Medium of transport (B) Raw materials (C) Isolated land
(D) Competition (E) Topography
- iii) Tord Palander has rejected Webber's least cost location while proposing;
- (A) Feasible region (B) Market area (C) Isodapane
(D) Hierarchy of settlements (E) Theory of influence of diminishing returns
- iv) What is meant by "locational pull" in variable cost model?
- (A) Basic cost of required quantity X Cost of transporting a unit of weight per a unit of distance
(B) Locational rent X transport cost
(C) Basic cost X distance
(D) Transport cost X material index
(E) Distance X material index
- v) Walter Crisaller's central place theory was highly influenced by the ideas of ;
- (A) Von Thünen (B) Weber (C) Lösch (D) Palander (E) Smith

vi) Push and pull law of migrations has been introduced in 1885 by;

- (A) August Lösch (B) Tord Palander (C) David Smith
(D) Walter Christaller (E) E.G. Ravenstein

(03 Marks)

B) Explain briefly the use of following mathematical operations in locational models with appropriate diagrams and examples.

- i) Escribed circle of a triangle
ii) Pythagoras's theorem
iii) Linear programming

(06 Marks)

C) Explain the relationship between following pairs using examples.

- i) Locational cost and Transport cost
ii) Agglomeration of economy and revenue

(04 Marks)

D) Answer the following questions

- i Table 1, 2 and 3 show the data of population in the cities of origin, the distance between origin and destination of cities and the interactions between cities in a country respectively. Find out the existing population of the destination cities using provided data.

Table-1: Population data of the cities of origin	
Cities	Population
A	19000
B	35000
C	41000

Table-2: Distance between cities			
Destination Origin	X	Y	Z
A	2	8	6
B	8	3	4
C	6	4	3

Table-3: Interactions between cities			
	X	Y	Z
A	114000000	23750000	28500000
B	13125000	311111111.1	118125000
C	27333333	205000000	246000000

(03 Marks)

- ii Prepare two space cost curves on a same graph using the distance P to Q of figure no 1 and 2. Briefly discuss the possible reasons for the dissimilarities of the curves prepared by you.

Figure-1: Isolines and Isodpane of incident-1

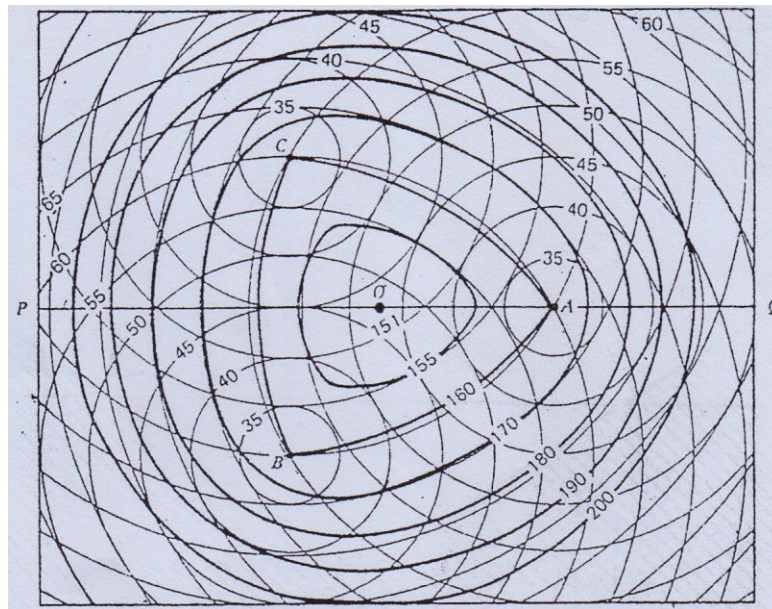
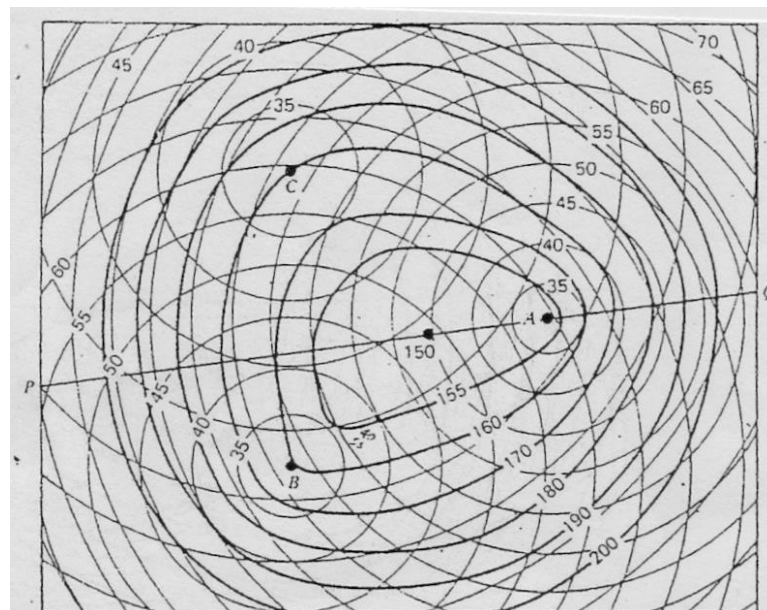


Figure-2: Isolines and Isodpane of incident-2



(04 Marks)

(Total Marks 20)

Part II

02. Loss of information is one of the major drawbacks in modeling due to simplification process of real world context. Therefore, modelling of real world objects and phenomena is an inappropriate effort. Critically evaluate the above statement using your knowledge of locational models.

(20 Marks)

03. “Modellers develop models based on their own experiences of their environments and they force the reality of other environment to validate their applications”. Do you agree with this statement? Discuss your answer using appropriate examples.

(20 Marks)

Part III

04. A tea company has recently acquired 110 hectares of land. Considering the physical geographical factors of the area, management wants to cultivate two types of tea varieties namely TRI 4041 and TRI 3073, intending to earn a maximum profit. Table 4 shows the estimated costs, net profits and labor requirements.

Assuming that the owner of the company is willing to spend maximum sum of Rs.1,500,000. The maximum labour availability is 1,200 man days for this cultivation. Answer the following questions using the available data.

Table-4: Costs, net profits and labor requirements of tea production

Variety of tea	Cost (Rs/Hect)	Net profit (Rs/Hect)	Man days
TRI 4041	15000	7500	10
TRI 3073	30000	18000	30

- Formulate the objective of the company in mathematical form
(01 Marks)
- State the possible constraints using equations to address the limitation of resources
(02 Marks)
- Propose a suitable resource combination pattern to optimize the utilization of available resources.
(10 Marks)
- Discuss the importance of modeling in planning of profit making decisions.
(07 Marks)

(Total Marks 20)

05. A and B are the locations of two raw material sites of a manufacturing company. Distance between the raw material sites is 800km. Market is located at P. Table 5 indicates the details of inputs, outputs and transport cost. Using provided data, answer the following questions.

Table 5: Details of inputs, outputs and transport cost

Location of raw materials	Input required to produce one unit of output (Kg)	Transport cost for input (Rs/km)	Distance from the market (km)
A	120	40	400
B	100	80	1000
Weight of one unit of output (kg)		Transport cost of one unit of output (Rs/km)	
50		4800	

- i) Construct a model to identify the least cost location to establish the manufacturing industry using available data and the knowledge of locational models. (10 arks)
- ii) Assume that the particular manufacturing company decided to purchase raw material only from site A. According to the new decision find out the suitable and profitable new location to locate the manufacturing industry. (03 Marks)
- iii) “Distance” plays a major role in identifying a location for a manufacturing industry. Explain the reasons related to the answers that you have given for question 5.i a 5.ii (07 Marks)
- (Total Marks 20)
