Total page: 01

PG (CBCS)
M.A. & M.SC. Semester - IV Examination, 2026
GEOGRAPHY
PAPER: GEO 407
(SPATIAL ANALYSIS IN GEOGRAPHY)
[PRACTICAL]

Full Marks: 25 **Time: 2 Hours**

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Answer ALL questions:

1. A company needs to transport goods from its three warehouses to four retail stores. The supply available at each warehouse, the demand at each store, and the transportation costs (in rupees) per unit from each warehouse to each store are given in the table below.

	Store A	Store B	Store C	Store D	Supply
Warehouse 1	4	6	8	6	**30**
Warehouse 2	5	8	7	7	**40**
Warehouse 3	7	5	6	8	**50**
Demand	**20**	**30**	**40**	**30**	

(a) What is the total transportation cost with the initial feasible solution?

(b) What is the optimized total transportation cost?

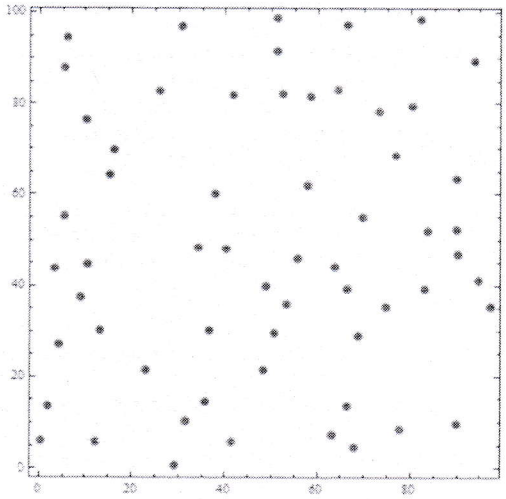
(c) Provide the final allocation plan (how many units from each warehouse to each store).

(d) Interpret the results in the context of minimizing transportation costs.

2+2+2+1=7

2. Observe the given scatter map of settlements and compute the Variance-to-Mean Ratio (VMR) to determine if the settlement pattern is random, uniform, or clustered. Conduct a significance test to determine whether the observed VMR value is significantly different from what would be expected under a null hypothesis of random spatial distribution.

4+3



3. Convert each angle in the given table to decimal degrees. Using the grouped data, plot the frequency of each bin on a circular plot (rose diagram). Compute the mean direction Θ_M and resultant length *R*. Determine if the mean direction is significantly different from random.

1+2+(1+1)+1=6

Table 1: Parameters of Directional Analysis

Stream ID	Θi	Stream ID	Θi	Stream ID	Θi
1	104°00′	8	29°00′	15	5°30′
2	111°00′	9	18°00′	16	53°45′
3	160°00′	10	3°00′	17	37°15′
4	90°00′	11	63°00′	18	347°00′
5	134°00′	12	50°00′	19	150°00′
6	84°00′	13	27°00′	20	17°30′
7	57°00′	14	344°00′	21	149°00′

4. Practical Note Book and Viva-voce. 5

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