2024

GEOGRAPHY — HONOURS

Paper : CC-7

(Statistical Methods in Geography)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Use of any scientific calculator is allowed in the Examination / Paper.

Category - A

Answer ***any five*** questions.

1. What is meant by discrete data? Give two examples of discrete data. 1+1

2. Which of these represents an example of ordinal, nominal, ratio and interval scale?
(a) pH, (b) Area of different districts (c) Land use types (d) Income levels. 2

3. Define frequency density. Determine the co-efficient of variation if standard deviation is 20 and mean is 80. 1+1

4. Describe any two characteristics of a normal distribution curve. 2

5. The temperature (°C) for 11 years is given in the following deta set :
21.5, 15.5, 33.5, 11.5, 18.5, 17.5, 30.5, 27.5, 25.0, 11.0, 13.0.
Determine the measure of Central Tendency which is also a partition value. 2

6. What is Sturge's formula? Why is it used? 2

7. What is the relationship between mean, median and mode in a moderately skewed frequency distribution? 2

8. What are partition values? How are they represented diagramatically? 2

Category - B

Answer ***any four*** questions.

9. A bag contains 5 green and 3 blue balls. If 2 balls are picked at random, what is the probability of both being green? 5

10. The monthly salary of 430 employees are given below (Table-1) :

Table - 1

Monthly Salary (Rs.)	No. of Employees
<3500	0
<4000	99
<4500	187
<5000	257
<5500	337
<6000	430

(a) Prepare a frequency distribution table.

(b) Draw a histogram. 2+3

11. Compare the advantages of standard deviation and co-efficient of variation as a method of dispersion. 5

12. Compute the values of Spearman's Rank Correlation between the price and sale of milk per day (Table - 2). 5

Table - 2

Region	Price of milk/lt in ₹	Sale of milk in liters
A	16.50	520
B	18.0	450
C	25.00	410
D	20.80	540
E	22.00	500
F	23.50	470

13. In an analysis of soil organic matter content and agricultural suitability index examined for 10 villages in a block, it was found that $\Sigma x = 60$, $\Sigma y = 7.5$, $\Sigma x^2 = 600$, $\Sigma y^2 = 6.5$ $\Sigma xy = 55$. Determine the Pearson's Correlation Coefficient 'r'. Test the hypothesis that the computed correlation coefficient is significantly different from zero at 5% level of significance. **(Refer to supplied Table A1- Critical Value of Students 't'.)** 2+3

14. Determine the standard deviation for literacy rate of male and female for 10 states and mention whether men or women has greater variation in literacy (Table - 3). 4+1

Table - 3

Literacy rates of 10 states by gender, NSSO, 2017.

State	Male	Female
Andhra Pradesh	80	60
Chattisgarh	85	69
Gujarat	90	76
Haryana	88	71
Jharkhand	83	65
Karnataka	84	72
Rajasthan	81	58
Maharashtra	91	78
Uttar Pradesh	82	64
West Bengal	86	77

Category - C

Answer ***any two*** questions.

15. What is Central Tendency? Explain different methods of measuring Central Tendency. Compare the advantages of different types of measures of Central Tendency. 2+5+3

16. Analyse the significance of Regression Analysis in geographical studies.

Using the data given in Table - 4 :

(a) Calculate Correlation Coefficient and interpret the relationship between variables.

(b) What will be the expected percentage of main workers if the literacy is 95%? 3+(3+2)+2

Table - 4

Sl.No.	% of literates	% of main workers
1	75	40
2	81	41
3	89	36
4	89	39
5	91	38
6	93	35
7	92	34
8	87	37
9	92	34
10	89	36

17. (a) What do you mean by secular trend in time series data analysis?

(b) On the basis of data provided in Table - 5, draw a time series graph to show the production of cocoa in India and compute and draw the trend by three year moving average. 2+(2+6)

Table - 5 : Cocoa Production (,000 MT) in India

Year	Cocoa Production (,000 MT)
2010-11	653
2011-12	692
2012-13	728
2013-14	737
2014-15	725
2015-16	670
2016-17	779
2017-18	817
2018-19	743
2019-20	703
2020-21	738
2021-22	752

18. (a) Define level of significance.

(b) A random sample of 385 people of both gender reveals the following details regarding their educational level. Using Chi Square test, determine whether there is any relationship between gender and level of Education and whether the relationship is significant at 5% level of significance. **(Refer to supplied Table of Critical Values of Chi square)** 2+8

Gender	Elementary School	High School	Graduate	Post Graguate	Total
Male	55	50	46	40	191
Female	35	45	54	60	194
Total	90	95	100	100	385

Q.No. 13.

Table A1 — Critical Value of Student's 't'

Degrees of Freedom	Significance level (one-tailed) 0.05	0.025	0.01	0.005	0.00005
	Significance level (two-tailed) 0.1	0.05	0.02	0.01	0.001
1	6.31	12.71	31.82	63.66	636.62
2	2.92	4.30	6.97	9.93	31.60
3	2.35	3.18	4.54	5.84	12.92
4	2.13	2.78	3.75	4.60	8.61
5	2.01	2.57	3.37	4.03	6.86
6	1.94	2.45	3.14	3.71	5.96
7	1.89	2.37	3.00	3.50	5.41
8	1.86	2.31	2.90	3.35	5.04
9	1.83	2.26	2.82	3.25	4.78
10	1.81	2.23	2.76	3.17	4.59
11	1.80	2.20	2.72	3.11	4.44
12	1.78	2.18	2.68	3.05	4.32
13	1.77	2.16	2.65	3.01	4.22
14	1.76	2.15	2.62	2.98	4.14
15	1.75	2.13	2.60	2.95	4.07
16	1.75	2.12	2.58	2.92	4.01

Q.No. 18(b).

Table A2 — Critical Value of CHI-Square

	Values of χ^2 with probability P of being exceed in random sampling v = number of degrees of freedom.				
v \ P	0.20	0.10	0.05	0.02	0.01
1	1.64	2.71	3.84	5.41	6.63
2	3.32	4.61	5.99	7.82	9.21
3	4.64	6.25	7.81	9.84	11.34
4	5.90	7.78	9.49	11.67	13.28
5	7.29	9.24	11.07	13.39	15.09
6	8.56	10.64	12.59	15.03	16.81
7	9.80	12.02	14.07	16.62	18.48
8	11.03	13.36	15.51	18.17	20.09
9	12.24	14.68	16.92	19.68	21.67
10	13.44	15.99	18.31	21.16	23.21