2021

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 Scientific Calculators is allowed in this Examination / Paper.

Category – A

Answer ***any five*** of the following questions.

1. Define inferential statistics. 2

2. Distinguish between primary and secondary data and mention one example of each. 2

3. Which of these is a ratio, which is ordinal, which is interval and which is nominal scale? 2

(a) Religion

(b) Income Level

(c) Salinity

(d) pH.

4. A box contains 15 Quartz specimens and 20 Galena specimens. If two minerals are drawn from the box at random one by one without replacement, what is the probability that this first mineral is Quartz and the second mineral is Galena? 2

5. If mean of the distribution is 56 and Σfx is 2520, where 'x' is class mark, determine the total frequencies (f). Mode can be represented on which diagram? 1+1

6. What is frequency density and when is it used? When is mean, median and mode identical? 1+1

7. Given the following data series representing number of households in ten different villages : 260, 375, 574, 656, 876, 503, 391, 280, 160, 101. Determine the measure of central tendency which is also a partition value. 2

8. Differentiate between normal and skewed frequency distribution. 2

Category – B

Answer ***any four*** of the following questions.

9. What is the difference between absolute and relative measures of dispersion? Give example of each and state which is better and why. 2+3

10. (a) What do you mean by Line of Best Fit?

(b) What is the equation / function that represents linear regression and non-linear exponential or logarithmic regression for bivariate data? 2+3

11. In an analysis of fertilizer use and food production given for 7 states, it was found that :

$\Sigma x = 20$, $\Sigma y = 30$, $\Sigma x^2 = 68$, $\Sigma y^2 = 136$, $\Sigma xy = 93$. Determine the Pearson's correlation coefficient and test the hypothesis that the computed correlation coefficient is not significantly different from zero at 0.05 level of significance. (Refer to Supplied Table A1 – Critical Value of Student's 't') 5

12. You are given a data on exports, both (quantity and value) of Indian jute to UK and USA from 2010-2015. Prepare a suitable tabular representation by constructing a block table. 5

13. What is a frequency distribution? Explain the method of formation of grouped frequency distribution table. 2+3

14. The following table gives the distribution of land in 2 mouzas. In which mouza the land is more equally distributed? 5

Size of the holding in acres	No. of Households	
	Mouza - I	Mouza - II
Less than 3	2	3
3 – 6	42	28
6 – 9	78	292
9 – 12	135	389
12 – 15	349	212
15 – 18	100	59
above 18	90	20

Category – C

Answer ***any two*** of the following questions.

15. What are the differences between Census and Sample data? What are the advantages and disadvantages of simple random sampling? 5+5

16. (a) On the basis of data provided in Table 2, draw a time series graph to show the Fish Production volume in West Bengal.

(b) Compute and draw the trend by four year moving average. 3+7

Table 2 : Fish Production (in Thousand Metric Tonnes) in West Bengal

Year	Fish Production (in Thousand Metric Tonnes)
2009	1650.37
2010	1701.82
2011	1671.42
2012	1617.32
2013	1580.65
2014	1490.02
2015	1472.05
2016	1443.26
2017	1505.00
2018	1484.00

17. (a) What do you mean by degrees of freedom?

(b) A random sample of 500 people revealed the following details regarding distribution of salary across gender (Table 3). Using Chi-square test determine whether there is any relationship between gender and the level of salary and whether the relationship is significant at 5% level of significance. (Refer to Supplied Table A2 – Critical Values of Chi-Square) 2+8

Table 3 : Educational Attainment Levels and Salary Levels of Population

Gender	Low Salary	Medium Salary	High Salary	Total
Male	40	90	120	**250**
Female	90	100	60	**250**
Total	**130**	**190**	**180**	**500**

18. What do you understand by Correlation coefficient? From the following data, compute the linear regression equation required for estimation of '*y*'. 2+8

Annual Rainfall (in cm)	Yield rate (in kg)
183.0	2687
201.5	2503
146.5	1979
153.0	2527
151.4	2340
164.5	2036
157.1	2836
175.3	2446
103.3	1812
150.0	2360

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

Table A2 – Critical Values 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