

M.Com. (Semester—III) (CGS) Examination
STATISTICAL ANALYSIS
Paper—302

Time : Three Hours]

[Maximum Marks : 80

- Note :—** (1) All questions are compulsory. Section A and Section B should both be solved.
(2) The figures to the right indicate marks to the question.
(3) Students may use alternate method, if not specified.

SECTION—A (MCQ)

Note :— Answer the following questions by choosing the correct option from those given below.

1. The Rank Correlation Co-efficient was developed by :
(a) Karl Pearson (b) Spearman
(c) Fisher (d) Bowley
2. The co-efficient of correlation :
(a) Has no limit (b) Can be less than 1
(c) Can be more than 1 (d) Varies between ± 1
3. If r is more than six times of its _____, it is called significant.
(a) Probable error (b) Standard error
(c) Both (a) and (b) (d) None of these
4. If $r = 0.3$, r^2 will be :
(a) 3 (b) 0.09
(c) 0.9 (d) 0.03
5. The term regression was first used by :
(a) Karl Pearson (b) Sir Francis Galton
(c) Spearman (d) None of these
6. If both the regression co-efficients are negative, the correlation co-efficient would be :
(a) Negative (b) Positive
(c) $\pm$ (d) None of these
7. The under-root of two _____ co-efficients give us the value of correlation co-efficients.
(a) Correlation (b) Regression
(c) Both (d) None of these
8. An Index Number is ideal if it satisfies :
(a) Time Reversal Test only (b) Factor Reversal Test only
(c) Both of these tests (d) None of these
9. The Index Number which adopts base year quantities is a method of :
(a) Laspeyre (b) Bowley
(c) Fisher (d) Paasche

10. Sampling is process of learning about the :

- (a) Sample
- (b) Population
- (c) Both of the above
- (d) None of these

11. The difference of two means in case of small sample is tested by the formula :

- (a) $t = \frac{\bar{x}_1 - \bar{x}_2}{s}$
- (b) $t = \frac{\bar{x}_1 - \bar{x}_2}{s} \sqrt{\frac{n_1 + n_2}{n_1 n_2}}$
- (c) $t = \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$
- (d) $t = \frac{\bar{x}_1 - \bar{x}_2}{s} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$

12. The probability of drawing a red ball from a bag containing 4 red and 5 white balls is :

- (a) $\frac{4}{5}$
- (b) $\frac{3}{5}$
- (c) $\frac{1}{9}$
- (d) $\frac{4}{9}$

13. The probability of getting exactly two heads in a simultaneous throw of three coins is :

- (a) $\frac{2}{8}$
- (b) $\frac{3}{8}$
- (c) $\frac{1}{8}$
- (d) $\frac{2}{3}$

14. Probability ranges from _____ to _____.

- (a) 1 to 1
- (b) 0 to 0
- (c) 0 to 1
- (d) None of these

15. The probability of drawing a card of red colour, in a single draw from a pack of cards is :

- (a) $\frac{4}{52}$
- (b) $\frac{2}{52}$
- (c) $\frac{1}{2}$
- (d) $\frac{1}{26}$

16. Yule's co-efficient of association can be :

- (a) Greater than 1
- (b) Less than 1
- (c) Has no limit
- (d) Can take any value between ± 1

17. The technique of estimating a past figure is termed as :

- (a) Extrapolation
- (b) Interpolation
- (c) Both
- (d) None of these

18. _____ method is also known as method of simultaneous equation.

- (a) Lagrange's
- (b) Binomial
- (c) Parabolic curve
- (d) Graphic

19. Chi Square Test is denoted as :

- (a) χ^2 Test (b) y^2 Test
(c) 'F' Test (d) 'T' Test

20. Upper control limit of R-Chart is given by :

- (a) D_3R (b) D_4R
(c) D_5R (d) None of these 1×20=20

SECTION—B

1. (a) Calculate Spearman's co-efficient of correlation from the following data :

x :	75	88	95	70	60	80	81	50	
y :	120	134	150	115	110	140	142	100	6

(b) From the following data, calculate correlation coefficient by Concurrent Deviations Method :

Price (X) :	70	75	44	56	84	32	62	63	60	
Imports (Y) :	120	132	96	78	60	72	42	43	40	6

OR

The following data gives the various values of two variables :

x :	42	44	58	55	89	98	66
y :	50	49	53	58	64	76	58

Find out :

- (i) Co-efficient of correlation
(ii) Two Regression equations. 12

2. Intelligence test on two groups of Boys and Girls give the following results :

	Number	Mean	Standard Deviation
Girls	121	84	10
Boys	81	81	12

Examine if the difference between the two group means is significant. 12

OR

Two laboratories carry out independent estimates of the fat ice-cream made by certain firm. A sample is taken from each batch, halved and the separate halves sent to the two laboratories. They obtained the following results :

Batch No. :	1	2	3	4	5	6	7	8	9	10
Lab. 'A' :	7	8	7	3	8	6	9	4	7	8
Lab. 'B' :	9	8	8	4	7	7	9	6	6	6

Assume that two laboratories carry out the same test; is the test reliable ? Table value of 't' for 9 degree is 2.26. 12

3. The following data relates to the sales in a time of trade depression of a certain proprietary article in wide demand. Do the data suggest that the sales are significantly affected by the depression ?

Sales	District		Total
	Hit by Depression	Not hit by Depression	
Satisfactory	250	80	330
Not satisfactory	140	30	170
Total	390	110	500

The table value of χ^2 for 1 Degree of freedom at 5% level of significance is 3.841.

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OR

Complete the Fisher's Ideal Price Index Number from the following data :

Items	Base Year		Current Year	
	Price	Total Cost	Price	Total Cost
	(Per Unit)	(Rs.)	(Per Unit)	(Rs.)
A	2	40	5	75
B	4	16	8	40
C	1	10	2	24
D	5	25	10	60

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4. (a) What is the probability of 53 Sundays in a leap year ? 6
 (b) 'A' speaks the truth in 75% cases and 'B' in 80% cases; in what percentage of cases are they likely to contradict each other in stating the same fact ? 6

OR

Given the following pairs of corresponding values of x and y :

x :	20	25	30	35	40
y :	73	198	573	1198	1450

Estimate the value of y for x = 22 by applying Newton's method.

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5. What is meant by Statistical Quality Control ? Discuss the need and utility of Statistical Quality Control in an industry. 12

OR

Find the trend values by the method of least squares from the following data :

Year	:	1991	1992	1993	1994	1995
Production						
(Tons)	:	107	110	114	114	115

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