

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, MAY/JUNE 2012

(CCSS)

Statistics—Complementary

ST 4C 04—APPLIED STATISTICS

Three Hours

Maximum Weightage : 30

Part A

*Answer all questions.**Each bunch of four questions carries '1' weightage.*

1. For a symmetrical distribution, the coefficient of skewness :

(a) $r_3 = 0$.	(b) $r_3 = 3$.
(c) $r_3 = 1$.	(d) $r_3 = -1$.
2. The term regression was introduced by :

(a) R.A. Fisher.	(b) Sir Francis Galton.
(c) Karl Pearson.	(d) James Bernoulli.
3. If X and Y are independent, the value of the regression Coefficient β_{YX} is equal to :

(a) 0.	(b) 1.
(c) ∞ .	(d) Any positive value.
4. If $\rho = 0$, the angle between the two lines of regression is :

(a) Zero degree.	(b) Ninety degree.
(c) Sixty degree.	(d) Forty five degree.
5. A time series consists of :

(a) Three components.	(b) Two components.
(c) Four components.	(d) Five components.
6. Seasonal variation means the variations occurring within :

(a) A number of years.	(b) Parts of a year.
(c) Parts of a month.	(d) None of the above.
7. Variations in the items produced in a factory may be due to :

(a) Chance causes.	(b) Assignable causes.
(c) Both (a) and (b).	(d) None of the above.

Turn over

8. The relation between expected value of R and S.D σ with usual constant factors is
- (a) $E(R) = d_1\sigma$. (b) $E(R) = d_2\sigma$.
- (c) $E(R) = D_1\sigma$. (d) $E(R) = D_2\sigma$.
9. If μ and σ are the process mean and S.D., then the control limits $\mu \pm 3\sigma$ are known as
- (a) Modified control limits. (b) Natural control limits.
- (c) Specified control limits. (d) None of the above.
10. \bar{X} and R Charts are used to find out :
- (a) Production control. (b) Cost control.
- (c) Material control. (d) Process control.
11. Randomization in an experiment helps to eliminate :
- (a) Systematic influences.
- (b) Human biases.
- (c) Dependence among observations.
- (d) All the above.
12. Local control is a device to maintain :
- (a) Homogeneity among blocks.
- (b) Homogeneity within block.
- (c) Both (a) and (b).
- (d) Neither (a) nor (b).

(12 × $\frac{1}{4}$ = 3 weightage)

Part B

Answer all questions.

Each question carries 1 weightage.

- II. 13. Define Kurtosis.
14. Define Correlation Coefficient.
15. What is a Scatter diagram ?
16. If there are three variables X_1 , X_2 and X_3 express the multiple Correlation Coefficient of X_1 with the other two.
17. Define multiple Correlation Coefficient.
18. Give the names of different methods of measuring trend.

19. What do you mean by specification limits ?
 20. Define assignable causes.
 21. What are the principles of experimentation ?

(9 × 1 = 9 weightage)

Part C

Answer any five questions.

Each question carries '2' weightage.

22. Derive the relation connecting central and raw moments.
 23. What are the uses of regression analysis ?
 24. Show that Correlation Coefficient is the geometric mean of the regression Coefficients.
 25. Discuss the simple average method for measuring seasonal variation.
 26. What are the applications of C-Chart ?
 27. State the objectives of \bar{X} and R Charts.
 28. Work out the analysis of variance for a two-way classification (one observation per cell).

(5 × 2 = 10 weightage)

Part D

Answer any two questions.

Each question carries 4 weightage.

29. (a) Distinguish between positive and negative correlation.
 (b) Calculate Coefficient of Correlation by Spearman's method from the following data :

Roll No	:	1	2	3	4	5	6	7	8	9	10
Marks in Statistics	:	45	56	39	54	45	40	56	60	30	35
Marks in Physics	:	40	56	30	44	36	32	45	42	20	36

30. (a) What are the Interpretations of P-Chart ?
 (b) The following are the figures of defectives in 22 lots each containing 2,000 rubber belts :
 425, 430, 216, 341, 225, 322, 280, 306, 337, 305, 356, 402, 216, 264, 126, 409,
 193, 326, 280, 389, 451, 420.

Draw control chart for fraction defective and comment on the state of control of the process.

Turn over

31. (a) Three varieties of Coal were analysed by four chemists and the ash content in the varieties was found to be as under :

Varieties	...	Chemists			
		1	2	3	4
A	...	8	5	5	7
B	...	7	6	4	4
C	...	3	6	5	4

Do the varieties differ significantly in their ash content ?

- (b) Describe any *one* method for determining trend to time series.

(2 × 4 = 8 weightage)