

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, MAY 2011

(CCSS)

Statistics Complementary

ST 4 C 04—APPLIED STATISTICS

Maximum : 30 Weightage

Three Hours

Answer all questions :

- 1 For a negatively skewed frequency distribution, the third central moment :

(a) $\mu_3 > 0$.	(b) $\mu_3 < 0$.
(c) $\mu_3 = 0$.	(d) μ_3 does not exist.

- 2 For a mesokurtic distribution 4th central moment is 243. Then the S.D. of the distribution is :

(a) 3.	(b) 6.
(c) 9.	(d) $\sqrt{3}$.

- 3 The lines of regression intersect at the point :

(a) (\bar{x}, \bar{y}) .	(b) (x, y) .
(c) $(0, 0)$.	(d) $(1, 1)$.

- 4 If $b_{xy} > 1$ then b_{yx} is :

(a) less than 1.	(b) 0.
(c) greater than 1.	(d) equal to 1.

- 5 The best method for finding seasonal variation is :

(a) Simple average method.	(b) Ratio to moving average method.
(c) Ratio to trend method.	(d) None of these.

- 6 A lock-out in a factory for a month is associated with the component of time series :

(a) Trend.	(b) Seasonal variation.
(c) Cyclic variation.	(d) Irregular variation.

- 7 Chance or random variation in the manufactured product is :

(a) Controllable.	(b) Not controllable.
(c) Both (a) and (b).	(d) None of the above.

- 8 Main tools of statistical quality control are :

(a) Shewhart charts.	(b) Acceptance sampling plans.
(c) both (a) and (b).	(d) None of the above.

Turn over

- 9 \bar{X} chart indicates :
- (a) Production control. (b) Variability.
(c) Centering of the process. (d) Proportion of defectives.
- 10 The control chart for number of defects per unit is :
- (a) \bar{X} chart. (b) R chart.
(c) C chart. (d) np chart.
- 11 The basic purpose of the Analysis of variance is to test the :
- (a) homogeneity of several variances.
(b) homogeneity of several means.
(c) homogeneity of experimental plots.
(d) None of these.
- 12 Analysis of variance was introduced by :
- (a) Karl Pearson. (b) W.F. Yates.
(c) R.A. Fisher. (d) G.E.P. Box.

(12 × ¼ = 3 weighta

II. Answer all questions :

- 13 What is meant by Kurtosis ?
- 14 Define moment measure of Skewness.
- 15 What do you mean by Rank correlation ?
- 16 Define multiple correlation coefficient.
- 17 What do you mean by Seasonal variations ?
- 18 Give control limits for C-chart.
- 19 What is the meaning of quality ?
- 20 Define assignable causes.
- 21 Describe the technique of the Analysis of variance.

(9 × 1 = 9 weighta

III. Answer any five questions :

- 22 Explain any two measures of skewness commonly used.
- 23 Discuss the properties of correlation coefficient.
- 24 Distinguish between partial and Multiple correlation coefficient.
- 25 What are the important components of a time series ?
- 26 State the objectives of \bar{X} and R charts.
- 27 Explain how C-chart is drawn in practice.
- 28 State the basic assumptions in an analysis of variance.

(5 × 2 = 10 weighta

Answer any five questions :

- 22 Explain any two measures of skewness commonly used.
- 23 Discuss the properties of correlation coefficient.
- 24 Distinguish between partial and Multiple correlation coefficient.
- 25 What are the important components of a time series ?
- 26 State the objectives of \bar{X} and R charts.
- 27 Explain how C-chart is drawn in practice.
- 28 State the basic assumptions in an analysis of variance.

(5 × 2 = 10 weightage)

Answer any two questions :

- 29 The following table gives the relative values of two variables :—

x	:	42	44	58	55	89	98	66
y	:	56	49	53	58	65	76	58

Determine the regression equations and also find the correlation coefficient.

- 30 (a) Discuss the theoretical basis of P and NP-charts.
- (b) Each day a sample of 50 items from a production process was examined. The number of defectives found in each sample was as follows :

6, 2, 5, 1, 2, 2, 3, 5, 3, 4, 12, 4, 4, 1, 3, 5, 4, 1, 4, 3, 5, 4, 2, 3.

Draw a suitable control chart and check for control.

- 31 You are given the population figures of India as follows :

Census Year (x)	1911	1921	1931	1941	1951
Population (in crores)	25.0	25.1	27.9	31.9	36.1
	1961	1971			
	43.9	54.7			

Fit an exponential trend $y = ab^x$ to the above data by the method of least squares and find the trend values. Estimate the population in 2021.

(2 × 4 = 8 weightage)