C 5175

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Name....................................

Reg. No.................................

FOURTH SEMESTER B.Sc. DEGREE (SUPPLEMENTARY/IMPROVEMENT) EXAMINATION, MAY 2016

(UG—CCSS)

Complementary Course

ST 4C 04—APPLIED STATISTICS

Time : Three Hours

Maximum : 30 Weightage

Part A

Answer all questions.
Each question carries a weightage ¼.

1. For a symmetric distribution, co-efficient of skewness is :

    (a) Zero.

    (b) One.

    (c) Three.

    (d) Positive.

2. The degree of concentration of values of a data around mode is measured using :

    (a) Skewness.

    (b) Kurtosis.

    (c) Coefficient of variation.

    (d) Regression.

3. Coefficient of correlation is independent of :

    (a) Change of origin.

    (b) Change of scale.

    (c) Both (a) and (b).

    (d) Neither (a) nor (b).

4. When $\rho = \pm 1$, the two regression lines are :

    (a) Perpendicular to each other.

    (b) Coincident.

    (c) Parallel to each other.

    (d) None of the above.

5. If $b_{xy} = -1.6$ and $b_{yx} = -0.4$, the correlation coefficient between them is :

    (a) −0.64.

    (b) 0.64.

    (c) 0.8.

    (d) −0.8.

6. In time series the variations that occur regularly in every year are termed as :

    (a) Trend.

    (b) Seasonal variations.

    (c) cyclical variations.

    (d) Random variations.

7. Moving average method of fitting trend in a tine series removes the effect of :

    (a) Long term movement.

    (b) Short term variations.

    (c) Cyclical variations.

    (d) None of the above.

Turn over

8. The terms prosperity and recession are attached to which of the component of Time Series.

    (a) Cyclical variations.   (b) Seasonal variations.

    (c) Random variations.   (d) Long term variations.

9. If the products show a marked deviation from the given specifications, it may be due to :

    (a) Random causes.   (b) Non-traceable causes.

    (c) Assignable causes.   (d) Non-assignable causes.

10. Control chart for fraction defectives are known as :

    (a) $\bar{X}$- chart.   (b) R-chart.

    (c) c-chart.   (d) p-chart.

11. In ANOVA the ratio of two component variations is distributed as :

    (a) x^2-variate.   (b) F-variate.

    (c) t-variate.   (d) Normal variate.

12. The error degree of freedom in a two way ANOVA with k rows and n columns is :

    (a) $(k-1)(n-1)$.   (b) $nk-1$.

    (c) $nk-2$.   (d) $n-k-1$.

                                  (12 × ¼ = 3 weightage)

Part B

Answer all questions.
Each questions carries a weightage 1.

13. Define Quartile co-efficient of skewness.

14. What is the formula to compute partial correlation coefficient $r_{12.3}$.

15. Define multiple correlation and regression.

16. For a bivariate data SD $(x) = 8$, SD $(y) = 10$ and $r_{xy} = 0.6$. Find the regression coefficients.

17. What are additive and multiplicative models in time series.

18. What is meant by cyclical variations.

19. What are the uses of control charts.

20. With usual notations, write the control limits for mean.

21. What are the assumptions in ANOVA.

                                  (9 × 1 = 9 weightage)

Part C

Answer any **five** *questions.*
Each question carries a weightage 2.

22. Distinguish between skewness and kurtosis.

23. Find the rank correlation coefficient of the following data :

x	:	15	28	24	21	20	18	29	30
y	:	47	65	54	48	54	70	68	72

24. 10 observations on a bivariate data yielded the following

    $\Sigma x = 130$ $\Sigma y = 220$ $\Sigma x^2 = 2288$ $\Sigma y^2 = 5506$ $\Sigma xy = 3467$. Obtain the line of regression of y on x and estimate y when $x = 16$.

25. Explain scatter diagram.

26. Compute trend by taking 3 yearly moving averages of the following data :

year	:	1995	1996	1997	1998	1999	2000	2001	2002	2003
values	:	121	125	127	113	115	121	127	135	142

27. Distinguish between process control and product control.

28. Explain ANOVA for a one way classification.

$(5 \times 2 = 10$ weightage$)$

Part D

Answer any **two** *questions.*
Each question carries a weightage 4.

29. (a) Explain the least square method of measing trend.

    (b) Fit a trend line by the method of least squares to the following data :

year	:	2002	2003	2004	2005	2006	2007	2008	2009
Sales	:	67	53	43	61	56	79	58	61

    Also estimate the trend values.

30. 16 boxes of switches each containing 20 switches were randomly selected and inspected for the number of defects. The number of defects in boxes are found to be :

    12, 15, 9, 14, 18, 26, 8, 6, 11, 12, 16, 13, 19, 18, 14, 21.

    Calculate 35 limits for c-chart. Draw control chart and comment.

Turn over

31. The following data gives the yield per acre of four different crops treated with three different types of fertilizers.

Crop

		I	II	III	IV
Fertilizer	A	4.5	6.4	7.2	6.7
	B	8.8	7.8	9.6	7.0
	C	5.9	6.8	5.7	5.2

Perform a two way Analysis of variance and test the hypotheses concerning type of fertilizers and variety of crops.

(2 × 4 = 8 weightage)