

Seat No. : _____

JF-101
January-2021
B.Sc., Sem.-III
202 : Statistics
(Descriptive Statistics – II)
(New Course)

Time : 2 Hours]

[Max. Marks : 50

Section – A

Attempt any **three** :

1. (a) What is correlation ? State its uses. 7
(b) State the methods of studying correlation. Explain the scatter diagram method. 7
2. (a) Explain Karl Pearson's method of obtaining correlation coefficient with its merits and demerits. 7
(b) Explain Spearman's rank correlation method. 7
3. (a) Give difference between correlation and regression. 7
(b) State and prove the regression coefficient of y on x and x on y . 7
4. (a) State the utility of regression and also state the properties of regression coefficients. 7
(b) Write a note on principle of least squares. 7
5. (a) Write a short note on Yule's method. 7
(b) Write a difference between correlation and association of attributes. 7
6. (a) Discuss different types of association of attributes. 7
(b) Write different methods of studying association. How will you determine the type of association using proportion method ? 7
7. (a) Explain bivariate data with example. 7
(b) State and prove properties of multiple correlation. 7
8. (a) Write a note on variance of Residuals. 7
(b) Derive the equation of plane of regression for three variables. 7

Section – B

9. MCQs (Attempt any **eight**) 8
(1) There is a perfect positive correlation between x and y if $r =$ _____.
(a) 1 (b) 0
(c) -1 (d) None of the above

- (2) If the change in the value of x and y are in opposite direction then they have _____ correlation.
- (a) Positive (b) Negative
(c) No correlation (d) Can't say
- (3) The range of r lies between _____ and _____.
- (a) -1 and 1 (b) 0 and 1
(c) -1 and 0 (d) -2 and 2
- (4) The value of R^2 lies between _____ and _____.
- (a) -1 and 1 (b) 0 and 1
(c) -1 and 0 (d) 0 and 2
- (5) There is no correlation between X and Y if $r =$ _____.
- (a) -1 (b) 0
(c) 1 (d) 0.5
- (6) If all the points in scatter diagram are scattered in random manner, $r =$ _____.
- (a) 0 (b) -1
(c) 1 (d) 2
- (7) In rank correlation if ranks for both the variables of each pair are same, $r =$ _____.
- (a) 0 (b) 1
(c) -1 (d) 2
- (8) The characteristics of the unit that cannot be expressed numerically is known as _____.
- (a) Variable (b) Attribute
(c) Quantity (d) None of the above
- (9) The range of Yule's coefficient of association is _____.
- (a) -1 to 1 (b) -1 to 0
(c) 0 to 1 (d) 1 to 2
- (10) In rank correlation if $\sum d^2 = 0$, $r =$ _____.
- (a) -1 (b) 0
(c) 1 (d) 0.5
- (11) The regression coefficient is independent of change of origin and scale
- (a) True (b) False
- (12) Two variables are uncorrelated hence the regression lines are perpendicular.
- (a) True (b) False
- (13) The correlation coefficient is the geometric mean of _____.
- (a) Regression coefficient (b) Correlation coefficient
(c) Linear constraints (d) None of the above
- (14) The product of regression coefficient is equal to the _____.
- (a) square of the correlation coefficient
(b) correlation coefficient
(c) inverse of correlation coefficient
(d) None of the above
- (15) There are _____ methods of studying correlation.
- (a) 1 (b) 2
(c) 3 (d) 4

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JF-101

January-2021

B.Sc., Sem.-III

202 : Statistics

(Mathematical Economics & Actuarial Science – I)

(Old Course)

Time : 2 Hours]

[Max. Marks : 50

Section – A

Attempt any **three** :

1. (a) What is Index Number ? Give its uses and limitations. 7
(b) Explain the term “selection of base year” and “selection of weights” in construction of index number. 7
2. (a) Explain fixed base index numbers and chain base index numbers for the construction of index number. Also give its merit and demerits. 7
(b) Explain time reversal tests and factor reversal tests. 7
3. (a) What is Fisher’s Index Number ? Why it is called ideal index number ? 7
(b) What is cost of living index number ? Give importance of family budget method for constructing cost of living index number. 7
4. (a) What is demographic statistics ? Explain briefly methods for collecting it. 7
(b) Give the meaning of crude and standardized death rates. How are they used in comparing the standards of health in two cities ? 7
5. (a) Explain the term : 7
(i) General Fertility Rate
(ii) Specific Fertility Rate
(iii) Total Fertility Rate
(b) Give the meaning of vital statistics and explain utility and defects of vital statistics. 7
6. (a) Write a brief note on life table. 7
(b) Write a note on force of mortality. 7

7. (a) Explain Lorentz curve mathematically and its deviation for some well known income distribution function. 7
- (b) Write a note on Income Distribution function. 7
8. (a) Explain : 7
- (i) Curate expectation of life
- (ii) Stationary population
- (iii) Force of mortality
- (b) Explain central mortality rate. 7

Section – B

- 9 Attempt any **eight** : 8
- (1) Which index number is considered to be ideal index number ?
- (2) Which averages used for construction of index number is generally considered to be ideal ?
- (3) In which of the index numbers only the quantities of the base year are taken into account for its construction ?
- (4) Which index number satisfies time reversal test ?
- (5) Which index number satisfies factor reversal test ?
- (6) Give the formula of converting chain base index numbers into fixed base index number.
- (7) If the price index number for the current year in relation to the base year is 125, then the purchasing power of money for the current year is _____.
- (8) The full form of CBR is _____ and IMR is _____.
- (9) The full form of SDR is _____ and TFR is _____.
- (10) Demography is derived from the _____ word demos.
- (11) $T_x = \frac{1}{2} lx + \text{_____}$
- (12) $e_x = \frac{?}{I_x}$
- (13) ${}^nq_x = \frac{?}{I_x}$
- (14) $I_{x+n} = I_x \cdot \text{_____}$
- (15) $m_x = \frac{dx}{?}$
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