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MBG-003-001212 **Seat No. _____**

B. Sc. (Sem. II) (CBCS) Examination

March / April - 2018

Statistics : S-201

[Old Course]

Faculty Code : 003

Subject Code : 001212

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instruction : (i) Q. 1 carries 20 marks.

(ii) Q. 2 and Q. 3 carry 25 marks.

(iii) Students can carry their own scientific calculator.

1 Multiple choice questions : **20**

(1) For comparing year to year changes in price level, the suitable index to be used is _____.

(2) Symbolically $P_{01} \times P_{10} = 1$ stands for _____.

(3) The correct relation between A.M., G.M. and H.M. is ____.

(4) If for a discrete series, the assumed mean

$A = 50, \sum fd = 45$ for $d = x - A, \sum f = 12,$

then the mean series is _____.

(5) If the mean and standard deviation of A and B are as $\bar{X}_A = 20.0,\ \bar{X}_B = 15.0,\ \sigma_A = 16$ and $\sigma_B = 25$, which of the two series is more consistent _____.

(6) _____ is unit less measure of dispersion.

(7) An empirical relation between standard deviation, mean deviation about mean and quartile deviation is ____.

(8) If the quartile deviation of a series is 60, the mean deviation of the series is _____.

(9) If the grouped data has open end calsses, one cannot calculate _____.

(10) If $\sum p_0 q_1 : \sum p_1 q_1 = 3 : 4$ then the Paache's index will be _____.

(11) Fisher's Ideal index formula satisfies _____.

(12) Sum of the absolute deviations about median is _____.

(13) The general decline in scale of cotton clothes is attached to the component of the time series _____.

(14) Most frequently used mathematical model of a time series is _____.

(15) Moving average method of fitting trend in a time series data removes the effect of _____.

(16) Trend in a time series means _____.

(17) In Binomial expansion method how is the missing value obtained ? $\Delta^n y_0$ =_____.

(18) ____ is the formula for $\Delta^2 y_1$ in the formula of values of y.

(19) If $y_1 = -5$, $y_2 = -1$, $y_3 = 6$ and $\Delta^2 y_2 = 4$, value of y_4 =_____.

(20) If $\Delta^2 y_1 = 3$ and $\Delta y_1 = 4$, the value of Δy_2 =_____.

2 (a) Answer the following questions : (any **three**) **6**

(1) The mean weight of a group of 20 persons was found to be 55 kg. Later it was discovered that one of them reported her weight as 45 kg which was actually 54 kg. Find the correct mean of their weights.

(2) What is time series ?

(3) Explain MS Excel function MEDIAN( ) with example.

(4) The mean of variable is 10 and the c.v. is 60%. What is the variance of the variable ?

(5) The mean of 10 observations is 16.5. If the mean of 4 of these 10 observations is 15, find the mean of the remaining observations.

(6) If $\sum p_1 q_0 : \sum p_0 q_0 = 5 : 4$ and $\sum p_1 q_1 : \sum p_0 q_1 = 8 : 5$. Find Fisher's index number.

(b) Answer the following questions : (any three) **9**

(1) Show that Fisher's index number satisfies both test Time reversal test and Factor reversal test.

(2) Explain MS Excel function with example : AVERAGE( ), AVEDEV( ).

(3) Explain different method of interpolation and extrapolation in brief.

(4) If the arithmetic mean of two numbers is 15 and their geometric mean is 9, find their Harmonic mean and also find the numbers.

(5) Find the value of variance and coefficient of variation from the following information :

$$\sum (x-7) = 8, \sum (x-7)^2 = 535, \; n = 15.$$

(6) Given below are the figures of production (in lakh kg.) of a sugar factory :

Year	2001	2002	2003	2004	2005	2006	2007
Production	40	45	46	42	47	50	46

Fit a straight line trend by the least squares method and tabulate the trend.

(c) Answer the following questions : (any two) **10**

(1) 3 students from a group of 18 students failed in the examination for the subject of physics. The marks obtained by 15 students who passed are as follows.

42, 65, 53, 75, 43, 50, 68, 57, 79, 48, 51, 61, 55, 70, 64. Find the median marks of all 18 students.

(2) Write comparison the methods of Karl Pearsons and Bowley for determining the coefficient of skewness.

(3) Explain components of time series in detail.

(4) If $u_x = \frac{1}{x}$, obtain Δu_x and $\Delta^2 u_x$. Hence, find the values of Δu_3 and $\Delta^2 u_2$.

(5) Obtain the number of workers earning wages between Rs. 60 and 70, by using appropriate method of interpolation for the following data :

Weekly wages (in Rs.)	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Number of workers (in '000)	250	120	100	70	50

3 (a) Answer the following questions : (any three) **6**

(1) Define : Geometric mean, Quartiles.

(2) What is time series analysis ? Write its utilities.

(3) Define : Extrapolation.

(4) Explain MS Excel function MODE( ) with example.

(5) The standard deviation of 20 observations is 3.2. If their coefficient of variations is 48%, find the sum of 20 observations.

(6) From the following chain base index numbers, find fixed base index numbers :

Year	2008	2009	2010	2011	2012	2013	2014
Index number	100	120	140	125	160	150	130

(b) Answer the following questions : (any three) **9**

(1) Explain the types of skewness.

(2) Write ratio to trend method to determine seasonal variations.

(3) Explain MS Excel function with example : STDEVP( ), if( ).

(4) For the two observations, arithmetic mean is 14 more than their geometric mean, If the ratio of two observations is 1 : 9. Find the two observations.

(5) A textile worker in the city of X earns Rs. 400 per month. The cost of living index for January, 1984 is given as 250. Using the following data find out the amount of the spend (i) Clothing and (ii) Rent.

Group	Expenditure (Rs.)	Group Index
Food	160	225
Clothing	?	256
Rent	?	275
Fuel and Lighting	40	300

(6) If $f(0) = 2,\ f(2) = 6,\ f(3) = 10$ derive the form of $f(x)$ by Lagrange's method.

(c) Answer the following questions : (any two) **10**

(1) Explain components of time series in detail.

(2) 'Index number is the barometer of the economy of a country' Elucidate this statement giving the use of index number.

(3) In examination, the average grade of all students in class A is 68.4 and that for students in class B is 71.2. If the average of both the class combined are 70. Find the ratio of the number of students in class A to the number is class B.

(4) The mean and the standard deviation of a characteristic of 100 items were found to be 60 and 10 respectively. At the time of calculations, two items were wrongly taken as 5 and 45 instead of 30 and 20. Calculate the corrected mean and corrected Standard deviation.

(5) Explain Skewness with its methods.