NBG-003-001212 Seat No. _____

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

**April / May - 2017**

## Statistics : Paper - 201

***(Old Course)***

**Faculty Code : 003**

**Subject Code : 001212**

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

**Instructions :** (1) Q-1 : 20 Marks.
(2) Q-2 & Q-3 carry 25 marks.
(3) Right side figures indicates marks.
(4) Students can use their own scientific calculator.

**1** Answer the following questions : **20**

(1) 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 _____

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

(3) For a positively skewed distribution, the correct relation between mean, median and mode 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) In Binomial expansion method how is the missing value obtained ?

(6) _____ is unit less measure of dispersion.

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

(8) Content of the cell A4 is 49. Excel will display _____ in cell B4 if we write = if (A>=30, "Pass", "Fail")

(9) For comparing year to year changes if price level, the suitable Index to be used is _____.

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

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

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

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

(14) Trend in a time series means _____

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

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

(17) By which method the cost of living index number is constructed ?

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

(19) If each value of a series is multiplied by constant 'c', the coefficient of variation as compared to original value is _____.

(20) If $\Delta^2 y_1 = 3$ and $\Delta y_1 = 4$, the value of $\Delta y_2 =$ _____

**2** (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 number :

| *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) (i) Why need measure of dispersion?

(ii) What is Standard deviation? Discuss its merits and demerits.

(2) Explain count and count blank function of MS-Excel.

(3) "Index number is the barometer of the economy of a country" Elucidate this statement giving the use of Index number.

(4) Prove the relation $\Delta = E - 1$

(5) State uses and limitation of cost of living index number.

(6) Define mean deviation also write its merits and demerits.

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

(1) Among the measures of central tendency, which measure do you consider to be ideal? Why?

(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 $\Delta u_x$ and $\Delta^2 u_x$, Hence, find the values of $\Delta u_3$ and $\Delta^2 u_2$.

(5) Write merits and demerits of method of moving average.

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

(1) Define : Quartile deviation, Standard deviation

(2) What is time series?

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

(4) Define : Interpolation

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

(6) If $\sum p_1 q_o : \sum p_o q_o = 5:4$ 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) 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 |

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

(3) Explain method of least square for finding trend values also write its merits and demerits.

(4) Why Fisher's price index number is an ideal Index number?

(5) Explain if function of MS-Excel