STATISTICS HSSC–I
SECTION – A (Marks 17)

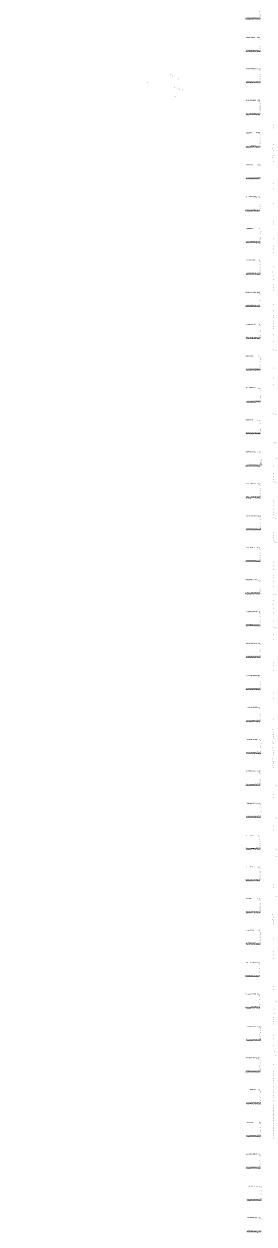**Time allowed: 25 Minutes**

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

1) Graph of a cumulative frequency distribution is called:
   - A. Historigram
   - B. Frequency curve
   - C. Ogive
   - D. Frequency polygon

2) Number of family members in different families is an example of:
   - A. Discrete variable
   - B. Continuous variable
   - C. Dependent variable
   - D. Qualitative variable

3) A set of all units of interest in a study is called:
   - A. Sample
   - B. Population
   - C. Parameter
   - D. Statistic

4) In a statistical table row captions are called:
   - A. Box head
   - B. Stub
   - C. Body
   - D. Title

5) If mean is less than mode, the distribution is called:
   - A. Positively skewed
   - B. Negatively skewed
   - C. Symmetrical
   - D. Bimodal

6) Sum of absolute deviations is least, when deviations are taken from:
   - A. Mean
   - B. Median
   - C. Mode
   - D. Geometric mean

7) Median divides data into:
   - A. 2 parts
   - B. 3 parts
   - C. 4 parts
   - D. 5 parts

8) For two independent variables X and Y, the $S.D(X-Y)$ is equal to:
   - A. $\sqrt{Var(X)+Var(Y)}$
   - B. $\sqrt{Var(X)-Var(Y)}$
   - C. $S.D(X)+S.D(Y)$
   - D. $S.D(X)-S.D(Y)$

9) A disadvantage of range is that it depends upon:
   - A. Absolute deviations
   - B. Squared deviations
   - C. Two extreme values
   - D. Two quartiles

10) Bowley's coefficient of skewness lies between:
   - A. 0 and 1
   - B. −1 and +1
   - C. −1 and 0
   - D. −2 and +2

11) In chain base method, the base period is:
   - A. 1st year
   - B. Last year
   - C. Fixed
   - D. Not fixed

12) Paasche's index numbers are also called:
   - A. Simple aggregative
   - B. Consumer price
   - C. Base year weighted
   - D. Current year weighted

13) Dependent variable is also called:
   - A. Explanatory variable
   - B. Predictor
   - C. Regressand
   - D. Regressor

14) The value of correlation coefficient lies between:
   - A. 0 and 1
   - B. −1 and 0
   - C. −1 and +1
   - D. −0.5 and 0.5

15) In method of least squares, the sum of squares of residuals is:
   - A. Minimum
   - B. Maximum
   - C. Zero
   - D. Negative

16) A straight line is fitted to the time series, when the variations are:
   - A. Linear
   - B. Non linear
   - C. Upward
   - D. Downward

17) Price hike in the month of Ramazan is an example of:
   - A. Secular trend
   - B. Seasonal variations
   - C. Cyclical variations
   - D. Irregular variations

STATISTICS HSSC–I

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

NOTE: Sections 'B and C' comprise pages 1-2. Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly. Graph paper will be provided on demand.

SECTION – B (Marks 42)

Q. 2   Attempt any FOURTEEN parts. All parts carry equal marks.　　　　　　　　(14 x 3 = 42)

(i)   Given $x_1 = 2$, $x_2 = 8$, $x_3 = -6$, $x_4 = 1$, $x_5 = 0$. Find $\sum_{i=1}^{5}(x_i - a)$ when $a = 2$

(ii)   What is raw data?

(iii)   Suppose that we have two series given below:

X	1	3	5	7	9	11
Y	10	8	6	4	2	1

Compute (i)　　$\sum XY$　　(ii)　　$\sum(X - Y)^2$

(iv)   Explain the term classification.

(v)   Following are the number of mistakes made by 25 typists in a typing test:

5, 6, 0, 5, 8, 4, 3, 5, 7, 9, 4, 7, 8, 6, 8, 3, 2, 7, 1, 1, 0, 2, 3, 4, 0.　　Make a frequency distribution.

(vi)   Define Geometric mean.

(vii)   For the following eight observations, show that $\sum(x - \bar{x}) = 0$

73, 78, 56, 38, 17, 25, 34, 33

(viii)   Define mean deviation.

(ix)   Differentiate between lower and upper quartiles.

(x)   A student obtained the following marks in an examination: English 73, Urdu 82, Maths 80, Islamiyat 57 and Science 62. Find the weighted mean if the weights of 4, 3, 3, 2 and 2 are allotted to the subjects respectively.

(xi)   Define Arithmetic mean and mode.

(xii)   Differentiate between simple and composite index numbers.

(xiii)   If link relatives are 100, 120, 102, 105, 118, 112, 115, 120, 110. Find the chain indices.

(xiv)   Explain the term Regression.

(xv)   If $n = 8$, $\bar{x} = 45$, $\bar{y} = 72.125$, $S_x = 22.91$, $S_y = 13.96$, $\sum xy = 28480$. Find the value of correlation coefficient.

(xvi)   Given $r = 0.605$, $S_x = 2.12$, $S_y = 2.34$, $\sum(x - \bar{x})(y - \bar{y}) = 24$ find the number of pairs.

(xvii)   With which characteristic movement of a time series would you mainly associate each of the following:

a.   A need for increased wheat production due to constant increase in population.

b.   An era of prosperity

c.   An after Eid sales

(xviii)   Fit a straight line $y = a + bx$ from the following results for the years 1948-58 (both inclusive)

$\sum x = 0$, $\sum y = 438.9$, $\sum x^2 = 110$, $\sum xy = -84.4$

(xix)   Differentiate between Histogram and Historigram.

Note: Attempt any TWO questions. All questions carry equal marks.   (2 x 13= 26)

Q. 3 Calculate Pearson's coefficient of Skewness for the given data: **(13)**

Group	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
Frequency	14	25	40	32	17	10

Q. 4 The following table gives the prices and quantities of four commodities for the years 2002 and 2005.   **(13)**

Commodity	Price		Quantity	
	2002	2005	2002	2005
A	70	75	300	310
B	72	80	240	275
C	25	32	132	148
D	60	85	280	360

Show that the Fisher's index is geometric mean of Laspeyre's and Paasche's index.

Q. 5 **a.** For the following data: **(06)**

X	1	2	3	4	5	6
Y	2	6	7	8	10	11

Find the estimated regression line and show that $\sum(Y - \hat{Y}) = 0$

b. Compute 4 quarters centered moving averages for the given time series: **(07)**

Years	Quarters			
	I	II	III	IV
1980	160	165	163	161
1981	170	167	172	171
1982	172	169	167	170
1983	175	177	172	170