Federal Board HSSC-I (2017)

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 question paper itself. It 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.

Q1. Circle the correct option i.e. A/B/C/D. Each part carries one mark.

(i) Census collects the:

A. Primary data
B. Secondary data
C. Fictitious data
D. Official data

(ii) The word "Statistics" has been derived from the German word:

A. Statista B. Status
C. Statistik D. Statistique

(iii) A variable which can take any possible value in an interval is called:

A. Discrete variable
B. Continuous variable
C. Qualitative variable
D. Finite variable

(iv) The graph of Time series data is called:

A. Historigram B. Pie chart
C. Histogram D. Ogive

(v) Total of relative frequencies is always:

A. Half B. One
C. 100 D. Quarter

(vi) The sum of deviations from mean is always:

A. Least B. Maximum
C. One D. Zero

(vii) Which of the following averages is not affected by extreme values?

A. Arithmetic mean B. Median
C. Mode D. G.M

(viii) If mean of 5 values is 10, then the sum of the values will be:

A. 2 B. 15
C. 25 D. 50

(ix) **The variance of the values 7, 7, 7, 7, 7, 7 is:**

A. 42 B. 7

C. Zero D. $\sqrt{7}$

(x) **If X and Y are two independent random variables, Var(x)=4 and Var(y)=9, then Var(2x+y) is:**

A. 13 B. 17

C. 25 D. 26

(xi) **In a symmetrical distribution, if Q_1=6 and Q_3 =18 then median is:**

A. 12 B. 15

C. 24 D. Zero

(xii) **The empirical relationship between mean, median and mode is: Mode=**

A. 3 Mean - 2 Median

B. 2 Mean - 3 Median

C. 3 Median - 2 Mean

D. 2 Median - 3 Mean

(xiii) **The Link relatives are the percentage ratios of current year price and:**

A. Previous year quantity

B. Base year quantity

C. Next year price

D. Preceding year price

(xiv) **Which index number helps the Government to formulate economic policies and determine the wages of employees?**

A. Whole sale price index

B. Consumer price index

C. Quantity index

D. Simple index

(xv) **The dependent variable is also called:**

A. Regressor
B. Explanatory variable
C. Predictor
D. Response variable

(xvi) **The value of correlation coefficient (r) lies between:**

A. 0 and 1 B. -1 and 0
C. -1 and 1 D. -2 and 2

(xvii) **Increased demand of soft drinks in summer and woolen clothes in winter season is:**

A. Seasonal variation
B. Secular variation
C. Cyclical variation
D. Random variation

SECTION - B (Marks 42)

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

(i) Differentiate between primary and secondary data.

(ii) Differentiate between discrete and Continuous variable.

(iii) In a music competition, students are asked to rate the music on five points scale A, B, C, D, E where A represents the maximum enjoyment and E represents minimum enjoyment. The ratings are:

A, D, A, D, E, B, C, D, A, B, B, C, E, A, C, E, C, A, B, E, D, E, B, A, B, E, E, C, B, A.

Construct a frequency distribution for the above ratings.

(iv) Write down the properties of a good average.

(v) The average marks obtained by three sections of first year class are given below:

Sections	Number of Students	Means
A	45	68
B	42	58
C	38	52

Find the combined Mean of the whole class.

(vi) For a frequency distribution of X:
$D = X - 40$, $\sum fD = 150$, $\sum f$
Calculate Arithmetic Mean.

(vii) A variable Y is determined from a variable X by an equation, $Y = 10 - 4X$ and X = -3, -2, -1, 0, 1, 2, 3, 4, 5. Find $\bar{Y}$ and show that $\bar{Y} = 10 - 4\bar{X}$.

(viii) Define Mean deviation and variance.

(ix) For frequency distribution of x, it is given that Mean = 50, Mode=45 and variance=64. Find Coefficient of variation and coefficient of skewness.

(x) If Mean=75, Mode=70, using empirical relation, find the value of Median.

(xi) Differentiate between fixed and chain base method.

(xii) Compute chain indices from the following:

Year	1990	1991	1992	1993	1994	1995
Price	10	12	15	20	25	30

(xiii) Define Consumer price index and write down the major groups included in CPI.

(xiv) If Laspeyre's index is 120 and Paasche's index is 130, then find Fisher's index number.

(xv) Differentiate between regression and correlation.

(xvi) It is given that:

$S_{yx} = 32, \quad S_x = 2.4, \quad S_y = 25,$

$\bar{X} = 155, \quad \bar{Y} = 70, n = 10$

Calculate regression coefficients b_{yx} and $b^{\wedge}$.

(xvii) Find the correlation coefficient (r) from the regression coefficients.

a. 0.85 and 0.6

b. - 0.96 and - 0.55

(xviii) What are the different components of time series?

(xix) Calculate three years moving average for the following time series:

Year	1980	1981	1982	1983	1984	1985	1986	1987
Sale (Rs)	100	140	168	120	200	210	170	220

SECTION - C (Marks 26)

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

Q.3 a. Find arithmetic Mean, Median, Mode, Q_1 and Q_3 of the following frequency distribution: (08)

Weight	118-126	127-135	136-144	145-153	154-162	163-171	172-180
Frequency	3	5	9	12	5	4	2

b. Calculate variance, standard deviation and coefficient of variation: (05)

Class	1-3	3-5	5-7	7-9	9-11
Frequency	2	4	10	3	1

Q.4 **a.** Compute chain indices from the following price relatives using (i) Mean (ii) G.M as an average: (08)

Years		Price relatives		
	A	B	C	D
2000	81	77	119	55
2001	62	54	128	52
2002	104	87	111	100
2003	93	75	154	96
2004	60	43	165	88

b. An inquiry into budgets of the middle class families in a city for year 1989 - 1990 was conducted.

The following price relatives are given: (05)

Expenses	Food	Rent	Clothing	Fuel	Misc
Weights (W)	35%	15%	20%	10%	20%
Price relative (I)	116	120	125	125	150

Q.5 **a.** The following data is obtained in a study on the number of absentees (X) and the final **Marks (Y) of** seven **students** from **a** class. (07)

X	6	2	15	9	12	5	8
Y	82	86	43	74	58	90	78

(i) Compute Correlation coefficient (r).

(ii) Obtain regression line Y on X and estimate final marks when there are 20 absentees.

b. Find 4-qurarters centered moving averages from the following time series data: (06)