Version No.				
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ROLL NUMBER					

STATISTICS HSSC–I

SECTION – A (Marks 17)

Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

Do not use lead pencil.

حصہ اوّل لازمی ہے۔ اس کے جوابات اسی صفحہ پر دیے گئے دائرے مرکز کے حوالے کریں۔ کاٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

Answer Sheet No. _____

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔ **Invigilator Sign.** _____

Fill the relevant bubble against each question according to curriculum: **Candidate Sign.** _____

	Question سوال	A	B	C	D	A	B	C	D
1.	Data in the population census reports are:	Group data	Secondary data	Primary data	Arrayed data	○	○	○	○
2.	The **only continuous** variable in the following is:	Rainfall on different days in a city	Number of students admitted in a college	Number of flights landing on an airport	Number of customers entering a store	○	○	○	○
3.	If the number of workers in a factory is 128; the maximum and minimum hourly wages are 100 and 20 respectively. For the frequency distribution of hourly wages, the class interval can be:	7	10	25	60	○	○	○	○
4.	If the smallest observation in a data is decreased, which of the following is **least likely** to be effected?	Mode	Median	Mean	Harmonic mean	○	○	○	○
5.	Which measure of dispersion can be computed in case of opened class interval?	Standard deviation	Range	Quartile deviation	Coefficient of variation	○	○	○	○
6.	The second moment about the arithmetic mean is 16, the standard deviation will be:	16	4	2	0	○	○	○	○
7.	The general purchasing power of the currency of a country is determined by:	Retail price index	Volume index	Composite index	Whole sale price index	○	○	○	○
8.	Indices calculated by the chain base method are free from:	Seasonal variation	Errors	Percentages	Ratios	○	○	○	○
9.	When the ratio of variation in the related variables is constant, it is called:	Linear correlation	Non-linear correlation	Positive correlation	Negative correlation	○	○	○	○
10.	The predicted rate of response of the dependent variable to changes in the independent variables is:	Slope	Intercept	Error	Regression equation	○	○	○	○
11.	If $Y = -10X$ and $X = -0.1Y$, then r is equal to:	0.1	0.2	–1	10	○	○	○	○

	Question سوال	A	B	C	D	A	B	C	D
12.	The multiplicative model of the time series is:	Y=T+S+C+I	Y=TSCI	Y=a+bx	$Y=a+bx+cx^2$	○	○	○	○
13.	The **most commonly** used mathematical method for measuring the trend is:	Moving average method	Semi average method	Method of least squares	The method of free hand curve	○	○	○	○
14.	Base year weighted index numbers are also known as:	Laspeyre's index	Paasche's index	Fisher's index	Walsh index	○	○	○	○
15.	A series of data with exclusive classes along with the corresponding frequencies is called:	Discrete frequency distribution	Continuous frequency distribution	Percentage frequency distribution	Cumulative frequency distribution	○	○	○	○
16.	The lower and upper quartiles of a symmetrical distribution are 40 and 60 respectively, the value of median is:	40	50	60	$\frac{(60-40)}{2}$	○	○	○	○
17.	When regression line passes through the origin, then:	Intercept is zero	Regression coefficient is zero	Correlation is zero	Association is zero	○	○	○	○

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STATISTICS HSSC–I

Time allowed: 2:35 Hours **Total Marks Sections B and C: 68**

NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Write your answers neatly and legibly. Statistical table 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) How is the class interval determined in the construction of frequency distribution?

(ii) Write a short note on the cumulative frequency of polygon.

(iii) Given $\sum_{i=1}^{4} x_i = 20$, $\sum_{i=1}^{4} y_i = -10$ and $\sum_{i=1}^{4} x_i y_i = 15$ find $\sum_{i=1}^{4} (x_i + 2)(y_i - 2)$

(iv) Describe the importance and uses of averages in practical life.

(v) What are quartiles? Write down their formulas.

(vi) The arithmetic mean and geometric mean of the two observations are 25 and 20 respectively. Find H.M. of these two observations.

(vii) What is CPI? How is it calculated?

(viii) What is meant by link relatives? Describe the different types of index numbers.

(ix) Given $w = 20, 25, 30, 40$ and $i = 100, 105, 110, 120$. Find consumer price index number.

(x) Differentiate the terms "no correlation" and "curvilinear correlation". Also write down the properties of correlation coefficient.

(xi) Sketch the scatter diagrams for the following terms:

a) Perfect positive linear correlation **b)** Strong negative linear correlation **c)** No linear correlation

(xii) Given $x = -3, -5, -7$ and $y = -3, -5, 7$ find r_{xy} and interpret the result.

(xiii) What is meant by time series? Distinguish between secular trend and seasonal variations.

(xiv) Explain briefly the moving average method and its merits.

(xv) Given $\sum x = 0, \sum y = 84, \sum xy = 210, \sum x^2 = 70$. Find the value of intercepts and slope.

(xvi) What are univariate and bivariate frequency distributions? Also describe the contingency table.

(xvii) Given $\sum (x - \bar{x}) = 90, S_y = 8, \sum (x - \bar{x})(y - \bar{y}) = 120, r = 0.5$. Find "$n$".

(xviii) Given $y = 1, 2, 3, 3, 6$, $x = 0, 1, 2, 3, 4$ and $\hat{y} = 0.6 + 1.2X$ show that $\sum e^2 = 2$

(xix) For a moderately skewed distribution the mean price is Rs.20/-, the median price is Rs.17/- and the coefficient of variation is 20%. Find coefficient of skewness.

SECTION – C (Marks 26)

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

Q. 3 Calculate the mean deviation from the mean and median of the marks of 80 students: **(13)**

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of students	3	8	9	15	20	13	8	4

Q. 4 Obtain the trend values for the following data by using the method of semi-averages. Construct graph illustrating the results obtained. **(13)**

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Consumption of cotton (thousands of bales)	706	854	886	815	827	761	805	797	746	727

Q. 5 a. Convert the following prices into price relatives using chain base method taking 2014 as a base year: **(06)**

Year	2014	2015	2016	2017	2018	2019	2020
Prices	36	45	56	64	70	80	90

b. Calculate the coefficient of correlation between the values of X and Y from the following table. Use 167 as a working mean for X and 210 as that for Y. **(07)**

X	176	187	195	167	157	177	159	159
Y	223	235	254	210	205	234	221	206