☆☆☆ | **Roll No** _____ | HSSC - (Part-II) A/2024 (For All Sessions) | **Paper Code** | 8 | 1 | 8 | 6

Statistics (Objective)   Time: 20 Minutes   Marks : 17

Note:- Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A,B,C or D in front of each question with marker or ink on the answer sheet provided.

1.1 If $Y = 2 + 0.6X$, then the value of Y-intercept is :
   (A)   2   (B)   Zero   (C)   0.6   (D)   2.6

2. Regression line always passes through :
   (A)   (X,Y)   (B)   (a,b)   (C) $(\bar{X}, Y)$ (D) $(\bar{X}, \bar{Y})$

3. Perfect positive correlation is signified by :
   (A)   -1   (B)   +1   (C)   0   (D)   <1

4. Two attributes A and B are said to be independent if :
   (A) $(AB) = \frac{(A)(B)}{N}$ (B) $(AB) \neq \frac{(A)(B)}{N}$ (C) $(AB) > \frac{(A)(B)}{N}$ (D) $(AB) < \frac{(A)(B)}{N}$

5. For 3×3 contingency table, the degree of freedom is :
   (A)   3   (B)   9   (C)   4   (D)   6

6. Long term variations in time series data are regarded as :
   (A)   Seasonal variations   (B)   Cyclical variations
   (C)   Irregular variations   (D)   Secular trend

7. In semi average method, data is divided into _____ parts.
   (A)   4   (B)   2   (C)   3   (D)   5

8. Which of the following is **NOT** hardware :
   (A)   Assembler   (B)   Hard disk   (C)   Key board   (D)   Motherboard

9. If Z is $N(0,1)$, then $P(-2 \leq Z \leq 2)$ is equal to :
   (A)   0.8013   (B)   0.9944   (C)   0.9544   (D)   0.8944

10. The coefficient of skewness of a normal distribution is :
   (A)   Zero   (B)   Positive   (C)   Negative   (D)   3

11. Normal distribution has parameters:
   (A)   1   (B)   2   (C)   3   (D)   4

12. Standard error of the mean is the standard deviation of :
   (A)   Popuplation   (B)   Sample   (C)   Parameter   (D)   Sampling distribution of means

13. The finite population correction factor is :
   (A) $\frac{n}{N}$ (B) $\frac{N}{n}$ (C) $\frac{N-1}{N-n}$ (D) $\sqrt{\frac{N-n}{N-1}}$

14. In sampling without replacement a sampling unit can be selected :
   (A)   Twice   (B)   Less than one
   (C)   Only once   (D)   More than one

15. An estimator T is said to be unbiased estimator of θ if :
   (A) $E(T) = \theta$ (B) $E(T) \neq \theta$ (C) $E(T) > \theta$ (D) $E(T) < \theta$

16. A formula used to estimate a parameter is called :
   (A)   Estimation   (B)   Estimator   (C)   Estimate   (D)   Bias

17. Rejecting H_0 when H_0 is true is :
   (A)   Standard error   (B)   Type-II error   (C)   Type-I error   (D)   No error

641-12-A

Rawalpindi Board-2024

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Roll No _____

HSSC- (Part-II) Annual / 2024
(For All Sessions)

Time: 2:40 Hours

Statistics (Subjective)

Marks : 68

Section - I

2. Write short answer of any eight parts of the following: (8x2=16)

(i) In a normal distribution $\mu = 50$ and $\sigma = 2$. Find μ_2.   (ii) $P(\mu \pm 2\sigma) = 0.9545$. Prove it.   (iii) If $Z \sim N(0,1)$, then find median.

(iv) What is the relationship between binomial and normal distribution?   (v) At what point normal distribution has maximum ordinate?

(vi) If n=64, $\sigma = 8$, $\bar{x} = 400$ and $Z_{1-\alpha/2} = 1.96$. Find confidene interval for μ.   (vii) Define interval estimation.

(viii) Explain two tailed test.   (ix) What is degree of freedom?   (x) Describe monitor.

(xi) Given $\sigma = 80$, n=625, $\mu = 350$ and $\bar{x} = 356$. Find Z.   (xii) Explain programming.

3. Write short answer of any eight parts of the following: (8x2=16)

(i) Define Non-sampling Error.   (ii) What is the difference between statistic and parameter?

(iii) Define probability sampling .   (iv) If $\mu = 40$, $\sigma_{\bar{x}} = 2$, n = 4. Find σ.

(v) Given n=2, $\sigma^2_{\bar{x}} = 2.5$, $\mu_{\bar{x}} = 10$. Find μ and σ if sampling is done with replacement.   (vi) What is scatter diagram?

(vii) Define standard error of sample means.   (viii) Write down any two properties of correlation coefficient.

(ix) What is the difference between regressor and regressand?   (x) If $b_{yx} = -0.35$, $b_{xy} = -0.65$. find " r ".

(xi) If we have n=12, $\sum xy = 89894$, $\sum x = 628$, $\sum y = 1684$, $\sum x^2 = 34416$. Compute the value of b_{yx}.

(xii) Given , $r_{yx} = 0.97$, $b_{yx} = 0.81$, $S_y = 14.34$. find "S_x".

4. Write short answer of any six parts of the following:- (6x2=12)

(i) Define attribute. Give two examples of attribute from real life.   (ii) Define Independence and Association.

(iii) Find (A) if (AB) = 30 and (Aβ) = 200.   (iv) What are components of a time series?

(v) What are four phases of a business cycle?   (vi) Define seasonal variation. Give its two examples.

(vii) Distinguish between signal and noise.   (viii) Write two merits of moving average method.

(ix) Write normal equations of a second degree parabola $\hat{Y} = a + bX + cX^2$

Section - II

Note: Answer any three questions from the following. (8x3=24)

5. (a) The scores made by candidates in a certain test are normally distributed with mean 500 and standard deviation 100. What percent of candidates received scores : (4)

   (i) Between 400 and 600   (ii) Which differ from mean by more than 150

   (b) A random variable X is normally distributed with mean = 40 and standard deviation = 4. Find the two points containing the middle 98% area. (4)

6. (a) Taking all possible samples of size 2 with replacement from the population 1,3,5. Show that the population mean is equal to the mean of sample means i.e. $\mu_{\bar{x}} = \mu$ (4)

   (b) There are five digits in a population 12,14,15,18,19. Draw all possible samples of size "3" without replacement and find sample proportion ($\hat{p}$) of even digits in each sample. Verify that $E(\hat{p}) = P$. (4)

7. (a) Find 95% confidence interval for a population mean from the given data: (4)

$$n=16, \sum X = 261.2, \sum(X - \bar{X})^2 = 13.22$$

   (b) Two samples of size 400 and 300 having means 52 and 50 are drawn from same population of $\sigma = 3$. Test the hypothesis $H_0: \mu_1 = \mu_2$ vs $H_1: \mu_1 > \mu_2$. Use $\alpha = 0.05$. (4)

8. (a) From the information given below: (4)

$\sum(X - \bar{X})(Y - \bar{Y}) = 150$, $S^2_X = 64$, $S^2_Y = 260$, n=16. Compute two regression coefficients.

   (b) Given the following data : (4)

n=10, $\sum X = 120$, $\sum Y = 250$, $\sum XY = 3070.7$, $S_X = 3.5$, $S_Y = 7.2$. Find correlation coefficient.

9. (a) An investigation into colour blindness and sex of a person gave the following results: (4)

Sex	Colour Blindness	
	Colour Blind	Not Colour Blind
Male	36	964
Female	19	981

Is there evidence at 5% level of significance of an association between sex of a person and whether or not they are colour blind?

   (b) Fit a straight line Y = a + bx from the following results for the years 1988-1998 (both inclusive): (4)

$\sum x = 0$, $\sum x^2 = 110$ $\sum y = 438.9$, , $\sum xy = 84.4$. Also find trend values.

★★★

Inter - (Part-II)-A-2022

Roll No — to be filled in by the candidate | (For All Sessions) | Paper Code | 8 1 8 6

Statistics (Objective Type)

Time: 20 Minutes Marks: 17

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with marker or pen ink on the answer sheet provided.

1.1. If $Y = 2 + 0.6X$, then value of $\hat{Y}$ for X = 0 is :

(A) 2 (B) 0.6 (C) 0.8 (D) 2.6

2. If $bxy = -0.52$ and $byx = -1.02$ then rxy is :

(A) 1 (B) 0.73 (C) 0.80 (D) -0.73

3. Dependent variable is also called :

(A) Regressand (B) Regressor (C) Explanatory variable (D) Predictor

4. For 3×4 contingency table, the degree of freedom will be :

(A) 12 (B) 6 (C) 3 (D) 9

5. A characteristic which varies in quality is called :

(A) Quantitative variable (B) Qualitative variable (C) Attribute (D) Both A & B

6. A business cycle has phases :

(A) 2 (B) 3 (C) 5 (D) 4

7. The graph of time series is called :

(A) Histogram (B) Historigram (C) Pie-chart (D) Ogive

8. CPU stands for :

(A) Central plain unit (B) Central programming unit

(C) Central processing unit (D) None of these

9. In a normal distribution, X lies between :

(A) $-\infty$ and 0 (B) $-\infty$ and ∞ (C) 0 and ∞ (D) 0 and 2

10. In normal distribution the value of β_1 and β_2 are :

(A) 0 and 3 (B) 3 and 0 (C) 0 and 1 (D) 1 and 0

11. In normal distribution the value of Quartile Deviation is :

(A) $\frac{2}{3}\sigma$ (B) 0.6745σ (C) Both A & B (D) 0.7979σ

12. If sampling is done with replacement, number of possible sample is :

(A) $\overset{N}{C}_{n}$ (B) $N \times n$ (C) $N + N$ (D) N^n

13. Probability distribution of a sample statistic is called :

(A) Time (B) Frequency distribution

(C) Sampling distribution (D) None of these

14. Procedure of selecting a sample from population is called :

(A) Sample (B) Sampling design (C) Sampling (D) None of these

15. 90% confidence interval for the mean is 53.22 and 64.78, then sample Mean is :

(A) 59 (B) 49 (C) 69 (D) 118

16. If $n = 8$ $\sum X = 120$, $\sum (X - \bar{X})^2 = 302$. Then unbiased estimated value of the population mean is :

(A) 15 (B) 120 (C) 8 (D) 302

17. Power of test is denoted by :

(A) $1 - \alpha$ (B) β (C) α (D) $1 - \beta$

Roll No._____ *to be filled in by the candidate*

Statistics (Essay Type)

Time: 2:40 Hours **Section - I** **Marks:68**

$2 \times 8 = 16$

2- Write short answers of any eight parts from the following.

i. Quartile deviation of a normal distribution is 3.3725. Find the approximate value of S.D and M.D.

ii. In a normal distribution $\mu = 9$ and $Q_3 = 171$. Find S.D (σ)

iii. In a normal distribution $\mu_4 = 243$. Find μ_2 and μ_3

iv. What is the role of standard deviation σ in the normal curve.

v. What is standard normal variable?

vi. Write any two properties of best estimator.

vii. What is interval estimation?

viii. If $t = 2.3$, $n = 10$, $\mu = 5$, $S = 3$, find $\overline{X}$

ix. Define type II error with example.

x. Define one tailed and two failed tests.

xi. What is a compiler?

xii. Differentiate between hard and soft copy.

$2 \times 8 = 16$

3- Write short answers of any eight parts from the following.

i. Distinguish between population and sample.

ii. Explain the term sampling frame.

iii. Given n = 25 and $\sigma_{\overline{X}} = 5$ find the value of σ^2.

iv. Given $\mu = 6$, n = 2 and $\sigma^2 = 10.8$ find $E(S^2)$.

v. Define the standard error.

vi. Draw all possible samples of size 3 without replacement from the population 0, 1, 2, 3, 4.

vii. Define dependent variable in regression model.

viii. If a = 130 and b = 3.9 write regression equation of Y on X.

ix. What is meant by Y-intercept "a"?

x. Given Y = 6, 8, 10 and X = 0, 1, 2. Find "b".

xi. Explain the meaning of regression coefficient.

xii. The regression equation of X on Y is $\hat{X} = 5y - 7$ and regression equation of Y on X is $\hat{Y} = 0.1X + 1.7$. Find correlation coefficient.

$2 \times 6 = 12$

4- Write short answers of any six parts from the following.

i. Define attributes.

ii. Define positive association.

iii. Given (A) = 200, (B) = 800, N = 1000. Find (AB) assuming A and B are independent.

iv. Define the term dichotomy.

v. Name the four methods used to measure the secular trend.

vi. Given Y = 16, 18, 20, 22, 24 and X = -2, -1, 0, 1, 2, and $\hat{Y} = 20 + 2x$, find $\sum \hat{Y}$.

vii. Give two examples of irregular variation.

viii. What is semi-averages method?

ix. What is meant by residual?

Section - II $8 \times 3 = 24$

NOTE : Answer any three questions from the following.

5.(a) In a normal distribution $Q_1 = 20$ and $Q_3 = 30$ find its Mean and Mean deviation.

(b) Let $X \sim N(30, 25)$. Find (i) P(X>35) (ii) P(X < 22)

04+04

6.(a) Take all possible samples of size 2 with replacement from the population 2, 3, 4, 5.
(i) Calculate means of the samples.
(ii) Construct sampling distribution of means.
(iii)Prove that $\mu_{\overline{x}} = \mu$.

(b) Find unbiased estimates of μ and σ from the sample of values 13, 18, 26, 34, 45 and 48.

04+04

7.(a) A normal population has a variance of 100. A random sample of size 16 selected from the population has a mean of 52.5. Construct the 90% confidence interval estimate of population mean, μ. Interpret the result.

(b) The sex distribution of 98 births reported in a newspaper was 52 boys and 46 girls. Is this consistent with an equal sex division in the population? Use 5% level of significance.

04+04

8.(a) For 9 observations on supply (X) and price (Y) the following data was obtained

04+04

$\sum(x-90) = -25$, $\sum(x-90)^2 = 301$, $\sum(y-127) = 12$, $\sum(y-127)^2 = 1006$, $\sum(x-90)(y-127) = -469$

Obtain the estimated line of regression of X on Y and estimate the supply when the price is Rs.125.

(b) Compute the correlation co-efficient between the variables X and Y represented in the following table.

x	2	4	5	6	8	11
y	18	12	10	8	7	5

9.(a) Given the following data
$(AB) = 110$, $(\alpha B) = 90$,
$(\alpha \beta) = 290$, $(\alpha \beta) = 510$. Discuss association

(b) Obtain the semi-averages trend line and find the trend values from the following data.

04+04

Years	Y
1973	201
1974	238
1975	392
1976	507
1977	484
1978	649
1979	742

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Inter - (Part-II)-A- 2018

Roll No. _____ *to be filled in by the candidate.*

| Paper Code | 4 | 6 | 4 | 3 |

Sessions:2015-2017&2016-2018

Statistics (Commerce Group) (Objective Type)

Time: 15 Minutes　　　　　　　　　　　　　　　　　　　　　　**Marks: 10**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

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1.1. A balance dice is rolled probability of an even number is:

(A) $\dfrac{1}{6}$ 　　　(B) $\dfrac{1}{2}$ 　　　(C) $\dfrac{1}{3}$ 　　　(D) $\dfrac{1}{4}$

2. If a coin is tossed twice,then the probability of getting one head and one tail is:

(A) $\dfrac{1}{4}$ 　　　(B) $\dfrac{2}{4}$ 　　　(C) $\dfrac{3}{4}$ 　　　(D) $\dfrac{2}{3}$

3. π is a:

(A) Constant 　　　(B) Variable 　　　(C) Statistic 　　　(D) Co-efficient

4. Questionnaire method is used in collecting:

(A) Primary data 　　　(B) Secondary data 　　　(C) Fictitous data 　　　(D) Private data

5. The upper and lower class limits are 20 and 30, the mid point of the class is:

(A) 20 　　　(B) 25 　　　(C) 30 　　　(D) 50

6. The sum of the deviations from arithmetic mean is:

(A) one 　　　(B) <0 　　　(C) =0 　　　(D) >0

7. The model letter of the word "Statistics" is:

(A) S 　　　(B) T 　　　(C) I 　　　(D) S and T

8. We must arrange the data before calculating:

(A) Mean 　　　(B) Median 　　　(C) Mode 　　　(D) None of these

9. Link Relative is equal to:

(A) $\dfrac{P_n}{P_o}\times100$ 　　　(B) $\dfrac{P_{n-1}}{P_n}\times100$ 　　　(C) $\dfrac{P_n}{P_{n-1}}\times100$ 　　　(D) $\dfrac{P_o}{P_n}\times100$

10. Simple index number involves commodities:

(A) one 　　　(B) two 　　　(C) three 　　　(D) four

Roll No._____ *to be filled in by the candidate.*

Sessions:2015-2017&2016-2018

Statistics(Commerce group) (Essay type)

Time: 1:45 Hours   **SECTION-I**   🎀 pakcity.org 🎀   Marks: 40

2- Write short answers of any six parts from the following.   **2 x 6 =12**

   i. Define Primary data.
   ii. Define Continuous Variable.
  iii. Define Qualitative variable.
  iv. Define Classification.
   v. Define Tabulation.
  vi. Define Histogram.
 vii. Define Class Interval.
 viii. Define Average.
  ix. Define Mode.

3- Write short answers of any six parts from the following.   **2 x 6 =12**

   i. Write two demerits of Median.
  ii. Define Central tendency.
  iii. Find median from 3,17,12,8,25,9.
  iv. Define Quantity Index Number.
   v. Define base year in Index Number.
  vi. What is weighted Index Number?
 vii. What is compound event in probability?
 viii. What are equally likely events?
  ix. Define dependent Events.

SECTION-II

Note: Attempt any two questions from the following.   **8x2=16**

4. (a) The grades in Statistics of 50 students are as under.   4

68	76	71	60	82	96	83	76	78	73
93	59	75	71	65	78	81	78	73	95
74	71	88	82	62	75	97	74	68	75
94	53	90	73	65	72	76	63	88	61
66	75	85	88	60	69	85	57	67	77

Make a frequency distribution taking classes as 50-54,55-59,60-64, etc

  (b) Calculate the Arithmatic Mean from the following data.   4

Hourly wages	No of Employees
40-59	13
60-79	23
80-99	101
100-119	182
120-139	105
140-159	19
160-179	7

5. (a) Find Mode for continuous distribution.   4

Group	15-19	20-24	25-29	30-34	35-39
f	3	8	12	9	4

  (b) Calculate Fisher's Price Index Number for 2006 taking 2005 as Base year.   4

	Price		Quantity	
Items	2005	2006	2005	2006
A	2	10	50	40
B	3	8	10	50
C	4	4	60	80

6. (a) A fair die is rolled once, what is the probability of obtaining.   4

   (i) Six.   (ii) an odd number.

  (b) A bag contains 10 light bulbs out of which 3 are defective.If two bulbs are selected at random from the bag,   4
   what is the probability that.

   (i) Both are defective   (ii) Both are not defective