

BOARD OF INTERMEDIATE EDUCATION, KARACHI
INTERMEDIATE EXAMINATION, 2025 (SUPPLEMENTARY)

Date: 20.12.2025

2:00 p.m. to 4:40 p.m.

STATISTICS PAPER – II
(Science General & Humanities Groups – Regular)

Max. Marks: 68

Time: 2 hours 40 minutes

SECTION 'B'
(SHORT-ANSWER QUESTIONS)

Marks: 36

Note: Answer any Nine part questions. All part questions carry equal marks. The use of scientific calculator is allowed.

2. i) How many 3-digit numbers can be formed from the digits 2, 4, 6 and 8, when:
- a) each digit can be used only once b) each digit can be used again
- ii) A bag contains 3 white, 4 black and 5 red balls. If 3 balls are drawn at random, determine the probability that:
- a) all 3 are red b) 2 are red and one is black
- iii) If A and B are the two events in sample space such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$ then find.
- a) $P(A/B)$ b) $P(A \cup B)$
- iv) Mean of a Binomial Distribution is 20 and the variance is 16. Calculate n , p and q .
- v) Describe Binomial Distribution with its properties.
- vi) The random variable X has the following probability distribution:
- | | | | |
|--------|------|-----|------|
| X | 1 | 2 | 3 |
| $P(X)$ | 0.25 | 0.5 | 0.25 |
- Find mean and variance of X .
- vii) Define simple and stratified random sampling.
- viii) For a Normal Distribution with Mean is 12 and Standard Deviation is 2 find:
- a) the area below 13.5 b) the area between 6 and 18
- ix) Define the following term:
- a) Sample Space b) Outcome
- x) Describe probability and its properties.
- xi) The following data table represents the ranking given by two judges to eight competitors in a voice competition:
- | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|
| Competitors | A | B | C | D | E | F | G | H |
| Judge-I | 5 | 2 | 8 | 1 | 4 | 6 | 3 | 7 |
| Judge-II | 4 | 5 | 7 | 3 | 2 | 8 | 1 | 6 |
- find Spearman's Rank Correlation between the ranking of two judges.
- xii) How many arrangements can be made from of the word FAVOUR, so that vowel will occupy even space if repetition not allowed?
- xiii) For the data given below, prove that: $r = \sqrt{b_{yx} \cdot b_{xy}}$
- $n=8$; $\sum xy = 36$; $\sum x = 23$; $\sum y = 16$; $\sum x^2 = 99$; $\sum y^2 = 68$
- xiv) A coin is tossed thrice, find the probability of getting:
- a) at most 2 heads b) at least 2 heads

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SECTION 'C'**(DETAILED-ANSWER QUESTIONS)****Marks: 32**

Note: Answer any Two question from this section. All questions carry equal marks. The use of calculator is allowed.

3. The following data represents the heights of father (X) and heights of his son (Y):

i) Find the correlation of coefficient between X and Y .

x	63	65	66	67	67	68
y	66	68	65	67	69	70

ii) Predict the height of son if the father's height is 70 inches.

4. a) A coin is tossed 400 times. Use the normal curve approximation to find the probability of obtaining

i) less than 209 heads

ii) between 185 and 210 heads

b) For the following probability distribution:

X	3	4	5
$P(X)$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

find i) $E(X)$

The following table shows the relation between the number of accidents in 1 year and the ages of drivers in a random sample of 500 drivers. Test that the number of accidents is independent of driver's age, when $\alpha = 0.01$.

Number of Accidents	Driver's age			Total
	18-25	26-30	Over 40	
0	75	115	110	300
1	50	65	35	150
2	25	20	5	50
Total	150	200	150	500

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