

**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**

Max. Marks: 68

(Science General & Humanities Groups – Regular)

**Time: 2 hours 40 minutes**

## **SECTION 'B'**

**(SHORT-ANSWER QUESTIONS)**

Markus: 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:

  - each digit can be used only once
  - 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:

  - all 3 are red
  - 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:

  - $P(A / B)$
  - $P(A \cup B)$

iv) Mean of a Binomial Distribution is 20 and the variance is 16. Calculate  $n$ ,  $p$  and  $q$ .

v) Define 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:

  - the area below 13.5
  - the area between 6 and 18

ix) Define the following term:

  - Sample Space
  - 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 the word FAVOUR, so that vowel will occupy even space if repetition not allowed?

xiii) For the data given below, prove that:  $r = \sqrt{b_{xx} \cdot b_{yy}}$

$$n = 8; \sum xy = 36; \sum x = 23; \sum y = 16; \sum x^2 = 99; \sum y^2 = 68$$

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 questions 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 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	10	300
1	50	65	35	150
2	25	20	5	50
Total	150	200	150	500