INTERMEDIATE PART-II (12th Class)	2025 (1st-A)	Roll No
STATISTICS PAPER-II		
TIME ALLOWED: 2.40 Hours	SUBJECTIVE	MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. **8 × 2 = 16**

(i) Define normal probability distribution

(ii) What is the relation between Mean, Median and Mode of normal distribution?

(iii) What is the role of mean μ in normal distribution?

(iv) In a normal distribution $\mu = 9,\ Q_3 = 171$ find σ.

(v) In a normal distribution $\mu_2 = 4$ find μ_3 and μ_4

(vi) What is meant by point estimation?

(vii) If $\overline{X} = 100,\ \sigma = 8$ and $n = 64$, set up a 95% confidence interval for μ.

(viii) Give one example of each type-I error and type-II error.

(ix) Distinguish between null and alternative hypothesis.

(x) Compute test statistic Z if $\overline{X} = 116,\ \mu = 120,\ \sigma = 15$ and $n = 100$.

(xi) Differentiate between RAM and ROM.

(xii) Write down the types of computers.

3. Attempt any eight parts. **8 × 2 = 16**

(i) Define probability sampling.

(ii) Explain standard error.

(iii) What is meant by sample survey?

(iv) If $\sigma = 4,\ N = 6,\ n = 2$ find $\sigma_{\overline{X}}$ when sampling is without replacement.

(v) Given $n = 25,\ \sigma_X = 5$ find value of σ^2.

(vi) Given $n = 5,\ p = 0.5$ find σ_p^2

(vii) What is meant by scatter diagram?

(viii) Given $\overline{X} = 1,\ \overline{Y} = 1$ and $b = 2$ find a.

(ix) Given $S_{XY} = 36,\ S_X = 4$ and $S_Y = 18$ compute b_{yx} and b_{xy}.

(x) Write down two properties of correlation coefficient.

(xi) Given $S_{xy} = 36,\ S_x = 8$ and $S_y = 9$ find r

(xii) Given $S_x = 4,\ S_y = 18.75$ and $r_{xy} = 0.48$ find S_{xy}

4. Attempt any six parts. **6 × 2 = 12**

(i) Define time series.

(ii) Give four examples of irregular variation.

(iii) Define seasonal variation.

(iv) Name different methods of measuring secular trend.

(v) Estimate Y for $X = 10$ from the given information by fitting a straight line.
$n = 5,\ \sum X = 0,\ \sum Y = 20,\ \sum XY = 62,\ \sum X^2 = 10$

(vi) Given $\hat{Y} = 13 + 0.8X$ is fitted to the years (2001 - 2005) with origin at 2003.
Find estimated value for the year 2007.

(vii) Define coefficient of association.

(viii) Define dichotomy.

(ix) If there are 144 A's and 384 B's in 1024 observations, how many AB's will be if 'A' and 'B' are independent?

SECTION-II

NOTE: Attempt any three questions. **3 × 8 = 24**

5.(a) If $X \sim N(36, 25)$, find Q_1 and Q_3 — 4

(b) If $X \sim N(49, 36)$, find $P(X < 40),\ P(X > 55)$ & $P(40 < X < 60)$ — 4

6.(a) A random sample of size $n_1 = 2$ with replacement is drawn from a population 2, 4. Another random sample of size $n_2 = 2$ with replacement is drawn from another population 4, 8. Form a sampling distribution of $\overline{X}_2 - \overline{X}_1$ and show that $\mu_{\overline{X}_2 - \overline{X}_1} = \mu_2 - \mu_1$ — 4

(b) What will be the mean and variance of sample means if sample of size 4 is drawn without replacement from the population. 1, 2, 3, 4, 4, 4, 5, 5, 6, 6. Use property. — 4

7.(a) If $\overline{X} = 400,\ \sigma = 8,\ n = 64$. Construct a 95% confidence interval for the population mean μ. — 4

(b) A random sample of size 36 is taken from a normal population with known variance $\sigma^2 = 25$. If the mean of sample is $\overline{X} = 42.6$. Test the null hypothesis $H_0 : \mu = 45$ against $H_1 : \mu \neq 45$ with $\alpha = 0.05$. — 4

8.(a) The following statistics have been computed $\overline{X} = 14.19,\ \overline{Y} = 21.65,\ S_X = 5.71,\ S_Y = 6.73$ and $r = 0.651$. Construct the regression equation X on Y. — 4

(b) Given the following informations: — 4

X	50	43	52	40	80	65
Y	68	57	70	55	90	75

Compute and interpret the correlation coefficient.

9.(a) During influenza epidemic 15 boys and 8 girls became ill out of a class of 22 boys and 28 girls. — 4
(i) Draw up a contingency table (ii) Test the hypothesis of no dependence of attributes at $\alpha = 0.05$

(b) Calculate three years moving averages of following data: — 4

Years	1980	1981	1982	1983	1984	1985
Values	12	14	16	18	17	16