

JAMIA HAMDARD
SCHOOL OF CHEMICAL AND LIFE SCIENCES

Program Name: **B.Sc. (Hons. with Research)/ B.Sc. (Hons.) as per FYUP**

Examination: **Odd Semester-I, December-2025**

Paper Code: **BBC/BBT/BBO/BCH/BTX/BCR MDC101**

Paper Title: **BASICS OF STATISTICS**

Time: 2 hours

Maximum Marks: 45

Attempt all Sections. All the parts of the Section must be attempted in continuation. Start answering each Question on a new page.

SECTION-A: Very short/ one word answer questions. Answer all questions. [1x15 =15]

1. Which measures of central tendency will be most suitable for skewed data?
2. What is the value of sum of deviations from its mean?
3. For symmetric distribution coefficient of skewness is-----?
4. The sum of 10 items is 12 and sum of their squares is 16.9. Variance-----?
5. If the assumed hypothesis is tested for rejection considering it to be true is called-----?
6. What will be the degree of freedom for two sample t-test of sizes 13 and 17?
7. What will be sample space for tossing a coin and a die?
8. The median of a series is 7. Two additional observations 0 and 20 are added to the series. Then the median of the new series will be-----?
9. Analysis of variance is a statistical method of comparing the _____ of several populations.
10. If two variables are independent, then Karl Pearson's coefficient of correlation will be?
11. What is the relationship among the mean, median and mode for positive skewed data?
12. In test of goodness of fit, the degrees of freedom of chi-square test will be _____.
13. The direction of a critical region in hypothesis testing depends on_____.
14. _____ is used for ascertaining whether there is any relationship in bivariate data.
15. In a one-way ANOVA, how many degrees of freedom are used for the between treatment variation?

SECTION-B: Attempt ANY THREE questions from the following.

[5x3 = 15]

1. Briefly explain qualitative and quantitative data with examples.
2. Suppose Doctor-A diagnoses 10% of all patients as positive, Doctor-B diagnoses 17% of all patients as positive, and both doctors diagnose 8% of all patients as positive. A patient is referred for further laboratory testing if either Doctor-A or Doctor-B makes a positive diagnosis. What is the probability that a randomly selected patient will be referred for further laboratory testing?
3. We wish to know if we can conclude that the mean daily caloric intake in the adult rural population of a developing country is less than 2000. A sample of 500 had a mean of 1985 and a standard deviation of 210. At the 5% of level of significance the critical value is ± 1.645 .

4. Give the definitions of mean, median and mode with their formulas. Calculate the mean, median and mode for the following data.

Salary (in rupees)	0-10	10-20	20-30	30-40	40-50
No. of employees	10	20	25	18	12

5. Differentiate Type-I and Type-II errors with real life examples.

SECTION-C: Attempt ANY TWO questions from the following.

[7.5x2 = 15]

- Define binomial distribution. Describe the main features of the binomial distribution. The survival rate for a particular disease is 20% and we have 10 patients with this disease. What is the probability that exactly 3 patients will survive.
- Define regression. An experiment is conducted to determine the relationship between rainfall and the wheat yield. Find out a regression line y on x from the data given below:

Rainfall (inches) X	6	2	10	4	8
Wheat yield (000, kg) Y	9	11	5	8	7

- Several studies suggest that women with higher parity (greater number of children) have a lower risk of developing ovarian cancer. In a recent study, data were collected from 25 women aged 40–49 who were diagnosed with ovarian cancer with mean parity of 1.8 with a standard deviation of 1.2. The mean number of children among women in the general population of this age group is known to be 2.5. Use the table value ± 2.064 .
 - Which statistical test would you use and why?
 - Test whether women with ovarian cancer have, on average, fewer children than women in the general population?

-----XXXX-----