

1058

M.Sc. (Bio-Informatics) Second Semester
MBIN-8007: Statistics and Probability

Time allowed: 3 Hours

Max. Marks: 60

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting atleast one question from each Unit.

x-x-x

I. Attempt the following:-

- a) Differentiate between attribute and variable.
- b) Explain Box and Whisker plot.
- c) What do you mean by Kurtosis?
- d) If $P(A|B) = 0.2$, $P(A) = 0.2$ and $P(B) = 0.5$ then find $P(A \cup B)$.
- e) Define probability mass function and probability density function.
- f) State Central limit theorem.
- g) What is the difference between null and alternative hypothesis?
- h) Explain two type errors in testing of hypothesis. (8x1½)

UNIT – I

II. a) What is the meaning of measurement in research? Discuss the types of the measurement scales by giving examples.

b) Write short note on:-

- i) Frequency Curve
- ii) Histogram
- iii) Frequency Polygon

(6,6)

III. a) Define various measures of central tendency. Bring out their relative merits and demerits.

b) What do you understand by skewness? How is it measure? Distinguish clearly, by giving figures, between the positive and negative skewness. (6,6)

P.T.O.

(2)

UNIT – II

IV. a) State and prove Bayes theorem and also explain its applications.

b) Write down the important properties of Expectation. (7,5)

V. a) What is difference between discrete and continuous random variables?

b) Given the bivariate data:-

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X | 1 | 5 | 3 | 2 | 1 | 1 | 7 | 3 |
| Y | 6 | 1 | 0 | 0 | 1 | 2 | 1 | 5 |

Calculate Karl Pearson's coefficient correlation. Fit a regression line of Y on X and then predict

Y if $X = 5$. (4,8)

UNIT – III

VI. a) Explain Normal approximation to binomial distribution.

b) State the assumption for testing of hypothesis. Also explain a test procedure for testing of difference the difference of population mean of two univariate normal distributions; assuming that the population variance is of two univariate normal distributions are same but unknown. (5,7)

VII. a) State the mathematical model for a two-way classified data. Explain (i) the symbols used, assumptions made and hypotheses to be tested, (ii) the test statistics to be used (iii) give the ANOVA table.

b) When are nonparametric tests used? Explain Wilcoxon signed rank Sign test. 8,4)