Exam Code: 0440
Sub. Code: 3012

1056

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. Use of simple calculator is allowed. Statistical tables will be provided on demand.*

x-x-x

I. Briefly explain the following terms:

i) Nominal and Ratio scale with examples

ii) Less than & more than cumulative frequencies

iii) Steps to construct Ogive curves

iv) Conditional probability with examples

v) Probability density function of Uniform distribution

vi) Level of significance

vii) Critical points of Chi-square distribution

viii) Type – II error

(8x1½)

UNIT – I

II. a) Differentiate between discrete and continuous variables, with examples.

b) Define the following:-

i) Coefficient of dispersion and its measures

ii) Measures of Central tendency and their properties

iii) Kurtosis, and how it can be measured

iv) Pie diagram

(4,8)

III. a) Define Skewnwss and discuss its various measures.

b) Find the mode of the following data:

Age (in Years)	30-39	40-49	50-59	60-69	70-79
No. of Patients:	29	73	113	85	15

(6,6)

P.T.O.

UNIT – II

IV. a) State and prove Bayes' theorem,

b) Explain the following terms with examples:

i) Sample space

ii) Independent events

iii) Probability mass function (pmf)

iv) Cumulative distribution function (cdf) and its properties (6,6)

V. a) What do you understand by the term 'Regression'? Define the regression equation of Y on X and its usefulness.

b) Define Karl Pearson's coefficient of Correlation and state its important properties. Also show that its value lies between -1 to +1. (6,6)

UNIT – III

VI. a) Define Normal distribution and state its important properties.

b) Define Poisson distribution with parameters λ. Find the expressions for its mean and variance. Under what conditions it can be approximated by a normal distribution. (6,6)

VII. a) Develop a test procedure for testing $H_0 : \mu_1 = \mu_2$ against $H_1 : \mu_1 \neq \mu_2$ when the two normal populations are independent and their variances are unknown.

b) Define ANOVA and state its assumptions, A test was given to five athletes at random from three different centers. The scores of the athletes out of 20 are given below:

Center – I :	19	17	16	15	18
Center – II:	17	14	15	14	15
Center – III:	16	13	10	17	16

Carry out the analysis of variance and state your conclusions,
(Tabulated F2,12=19.40 for α =0.05) (6,6)

x-x-x