Exam.Code:0435
Sub. Code: 3469

2031

M. Sc. (Biotechnology) First Semester

MBIO-105: Bio-Statistics

Time allowed: 3 Hours Max. Marks: 80

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

x-x-x

I. Answer the following:-

a) List the essential components of a statistical table.

b) Write down the properties of cumulative distribution function (CDF).

c) How can you determine median from Ogive curves.

d) Define conditional probability with example.

e) State the central limit theorem.

f) Define Type-1 and Type-11 errors.

g) Explain Factorial designs.

h) Define random variable with suitable examples. (8x2)

UNIT – I

II. a) What do you understand by central tendency? List various measures of central tendency and compare any two of them.

b) Calculate the median, mode and standard deviation for the following data:

X	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
F	7	9	13	18	11	6

(6,10)

III. a) Explain the advantages of graphical representation of a frequency distribution. Develop a frequency distribution with the help of a data set of your choice and draw a Histogram.

b) Explain the following:-

i) Equally-Likely Events with examples.

ii) Subjective Probability with examples.

iii) Cumulative frequency curves. (7,9)

P.T.O.

UNIT – II

IV. a) State and prove Baye's theorem.

b) Suppose that A and B are two independent events associated with an experiment. If the probability that A or B occurs equal 0.6, while the probability that A occurs equal 0.4, determine the probability that B occurs.

c): Show that if A and B are two independent events then A and B' are also independent. (7,6,3)

V. a) It is known that the population of a certain city is 45% female and 55% male. Suppose that 70% of the male and 10% of the female smoke. Find the probability that a smoker is male.

b) State and prove conditional probability theorem for two events.

c) In an experiment, a coin is thrown five times. Write down the sample space. How many points are there in the sample space? (6,6,4)

UNIT – III

VI. a) Define Poisson distribution with probability mass function. Also find its mean, variance and moment generating function.

b) Define normal distribution and list its important properties including area property.

c) If a and b are two constant then prove that E(aX+b)=aE(X)+b. (8,6,2)

VII. a) Define the following:-

i) Probability Density Function (PDF).

ii) Probability Mass Function (PMF).

iii) Cumulative Distribution Function (CDF).

b) Define discrete uniform distribution. Also find its mean and variance using moment generating function. (9,7)

UNIT – IV

VIII. a) Discuss the various advantages and disadvantages of CRD and LSD.

b) Explain three basic principles of designs of experiment. (10,6)

IX. Define Randomized Block Design (RBD). Write down its model and discuss the complete statistical analysis of RBD. Also give the ANOVA table. (16)

x-x-x