

2056
B.Sc. (Hons.) Bio-Informatics (FYUP)
Second Semester
BINF -2003: Statistical Methods in Bioinformatics

Time allowed: 3 Hours

Max. Marks: 60

Note: Attempt five Questions in all, including Question No. 1 which is compulsory and selecting two questions from each unit. Use of electronic calculator with four basic mathematical operations and upto one memory is allowed.

(Compulsory Question)

1. Answer the following:-

- i) Differentiate between classification and tabulation.
- ii) Define box and whisker plot.
- iii) Explain type-I and type-II errors.
- iv) Differentiate between discrete and continuous random variable.
- v) Write the formula of standard error in case of difference of two proportions.
- vi) What do you mean by one way ANOVA? (6×2)

Unit-I

2.(a) Discuss the various methods of collecting primary data.

(b) Construct the histogram and frequency polygon of the following data.

Class Interval:	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students:	12	16	24	30	18	15	10

(6, 6)

3(a). Explain the term dispersion and discuss its various measures.

(b). Find the mean, median and standard deviation of the following data:

Class	10	20	30	40	50	60	70
Frequency	4	7	10	15	8	4	2

(6, 6)

4(a). In a city, the probabilities are given as follows: (i) The probability of selecting either a female or an educated is $7/10$; (ii) The probability of selecting a female who is educated is $4/10$; (iii) The probability of selecting educated first and then a female is $2/3$.

Determine the probabilities of selecting: (a) a non-educated, (b) a female, and (c) a educated given that a female is selected first.

(b). If X be the random variable has the following probability distribution:

X:	1	2	3	4	5	6
p(x)	1/10	2/10	2/10	3/10	1/10	1/10

Find: (i) $P(X < 4)$, (ii) $P(2 \leq X \leq 5)$, (iii) The distribution function of X i.e., F(x) (6, 6)

P.T.O.

(2)

Unit-II

- 5(a). Define the followings:
 (i) Null and alternative hypothesis,
 (ii) Critical region and level of significance. (6, 6)
- (b) Discuss the chi-square test for goodness of fit problem. (6, 6)

- 6(a) In a test given to two groups of students, the marks obtained are as follows:

First group:	18	20	36	50	49	36	34	49	41
Second group:	29	28	26	35	30	44	46	-	-

Test the significance of the difference between the mean of marks secured by the students of the above two groups. (Given $\alpha = 5\%$).

- (b) Write the steps in testing for statistical hypothesis. (8, 4)
- 7(a). Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same against that they are not, at 5% level of significance.
- (b) Write a testing procedure to test the significance of difference for single mean in case a normal population for small sample size. (6, 6)

x-x-x