Test whether the variance in weights is the same for both groups at the 1% level of significance.

(c) In a general population, the average blood sugar level is 100 mg/dL with a standard deviation of 12 mg/dL. A new medication is being tested to lower blood sugar levels. A sample of 60 participants who took the medication showed an average blood sugar level of 92 mg/dL. Test whether the medication has caused a significant decrease in blood sugar levels in the population at a 5% level of significance. (6,6,6)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3010 **I**

Unique Paper Code : 3184002006

Name of the Paper : GE-Statistical Concepts in Biology (NEP-UGCF)

Name of the Course : **B.Sc. (Hons.) Biomedical Science**

Semester : III/V

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Attempt **any five** questions.
3. Subparts of the questions should be attempted together.
4. Use of simple/non-programmable scientific calculators is allowed
5. Statistical and log table will be provided

1. (a) Differentiate between the following (any 2)

(i) Descriptive and Inferential Statistics

(ii) T test and Z Test

(iii) Sample and population

(b) Explain the following (any 4)

(i) Discrete variable

(ii) Parameter

(iii) Quartiles

(iv) Alternate Hypothesis

(v) Covariance

(i) What is the probability that a student picked at random wears eyeglasses, given that the student is a boy?

(ii) What is the probability of the joint occurrence of the event of wearing eyeglasses and being a boy? (6,6,6)

6. (a) What is the addition rule of Probability? Explain with the help of an example.

(b) Two sets of data represent the weights (in kilograms) of two different groups of people:

Group1:

53, 57, 60, 61, 62, 65, 68, 71, 74

Group2:

49, 55, 58, 59, 60, 63, 67, 69, 72, 75, 78

5. (a) A pharmaceutical company develops a drug which it claims will increase hemoglobin content in aged people. The hemoglobin content (g/100ml) of 10 subjects is measured before and after administration of drug. On the basis of following data, determine whether company's claim is valid using appropriate test,

Subject	1	2	3	4	5	6	7	8	9	10
Before	10	9	11	12	8	7	12	18	10	9
After	12	11	13	14	9	10	12	14	11	12

(b) What is Standard Error? Give its relevance. Briefly explain about the Z test.

(c) In a certain high school class, consisting of 60 girls and 40 boys, it is observed that 24 girls and 16 boys wear eyeglasses. If a student is picked up at random from this class.

(c) Estimate mean, median, and mode of the given data

12, 16, 9, 14, 20, 24, 19, 16, 30, 16, 17 (6,8,4)

2. (a) State True/False. Justify your answer (Any three)

(i) The nominal scale is a quantitative scale of measurement.

(i) If the probability of an event is 0, it means the event is possible.

(iii) The Interquartile range is a measure of dispersion.

(iv) The Coefficient of correlation of an event is always between -1 and 1.

P.T.O.

(b) For the given tabulated data, find out the two linear regression equations:

X	20	30	50	70	90
Y	20	50	70	80	100

(6,12)

3. (a) In a clinical trial, a stress relieving drug is given to a group of 31 subjects. The following data represents the time (in minutes) for each patient to experience noticeable relief from the symptoms:

Data (in minutes):

22,24,27,23,25,24,23,26,28,25,27,24,26,29, 23,24,25,27,22,26,28,24,23,25,26,27,22,29,23,24, 25

Determine the interquartile range of this dataset, D7 and P75

(b) Difference between histogram and frequency polygon. (12,6)

4. Write short notes emphasizing importance/application of the following (Any 3):

(a) Kurtosis

(b) Use of Probability in assessing sensitivity and specificity of a diagnostic test

(c) Pie chart and its application

(d) Correlation (6,6,6)

P.T.O.