

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5698

L

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 : VI

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.

Q1. a) Differentiate between the following (any 2)

- i. Qualitative data and Quantitative data
- ii. Null Hypothesis and Alternate hypothesis
- iii. Independent t test and Dependent t test

b) Explain the following (any 4)

- i. Nominal scale
- ii. Ordinal scale
- iii. Frequency distribution
- iv. Line of least square distance

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

20, 21, 18, 14, 20, 24, 19, 18, 30, 18, 16

(6,8,4)

Q2. a) State True/False. Justify your answer (Any three)

- i. The probability of an event is always between 0 and 1.
- ii. A frequency polygon is constructed by joining the midpoints of the class intervals.
- iii. The range is a measure of Dispersion.
- iv. The ordinal scale is the simplest scale of measurement.

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

X	2	3	5	6	8
Y	3	5	6	8	10

(6,12)

Q3. a) A therapeutic drug is given to a group of 25 patients. The following data represents the time (in minutes) for each patient to experience relief from symptoms:

P.T.O.

Data (in minutes):

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

Determine the interquartile range of this dataset, D8 and P25

b) Differentiate between Bar graph and Pie chart. (12,6)

Q4. Write short notes on the following (Any 3):

a) Measures of Central tendency

b) Bayes theorem

c) Cumulative Frequency

d) Histogram (6,6,6)

Q5. a) As per Manufacturer's claim, 650mg dosage of antipyretic drug cures Fever in humans within an average 25 hours and a standard deviation of 5 hours. Six patients were randomly chosen and the number of hours taken to recover from fever was observed to be 24,26,30,20,20,19. Use an appropriate hypothesis test to validate the manufacturer's claim at 5% level of significance?

b) In a study group consisting of 70 females and 30 males, it is observed that 30 females and 10 males have anaemia . If a student is picked up at random from this class.

(i) What is the probability that a student picked at random has anaemia, given that the student is a female?

(ii) What is the probability of the occurrence of the event of having anaemia and being a female?

c) Write a short note on sampling distribution. (6,6,6)

Q6. a) What is the multiplicative rule of probability? Ten people are there in a room. Six are female (2 Hypertensive and 4 Non-Hypertensive) and 4 are male (1 Hypertensive and 3 Non-Hypertensive). What is the probability that a person picked at random. i) will be a Hypertensive male ii) will be a female, but Non-Hypertensive.

b) Two random samples were drawn from two normal populations. The data is as follows:

A	65	67	75	76	82	84	88	90	92		
B	63	66	74	78	82	85	87	92	93	95	97

Test whether the two populations have the same variance at 5% level of significance .

c) In the general population, the average cholesterol level is 175 mg/dL, with a standard deviation of 29 mg/dL. A group of researchers aims to test whether a new cholesterol lowering drug decreases the levels. A sample of 75 participants who have taken the medication shows an average cholesterol level of 158 mg/dL. Perform an appropriate statistical test to conclude whether the medication caused a significant decrease in cholesterol levels in the population.

(6,6,6)