



**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA,  
GUNUPUR  
(GIET UNIVERSITY)**

B. Tech (Fourth Semester - Regular) Examinations, April - 2025

**23BBTPC24002 – Biostatistics**

(Biotechnology)

Time: 3 hrs

Maximum: 60 Marks

**Answer ALL questions**

(The figures in the right-hand margin indicate marks)

**PART – A**

**(2 x 5 = 10 Marks)**

Q.1. Answer **ALL** questions

- a. What is a variable in biostatistics?
- b. What is random sampling?
- c. Differentiate between independent and dependent events with one example each.
- d. Explain the mutual exclusive events
- e. Differentiate between a paired *t*-test and an unpaired *t*-test.

CO #	Blooms Level
CO1	K1
CO2	K2
CO3	K1
CO5	K2
CO6	K1

**PART – B**

**(10 x 5 = 50 Marks)**

Answer **ALL** the questions

2. a. Give an account of role and application of biostatistics in biotechnology.
- b. The blood platelets (in lakh per cubic maxi meter) from the analysis of blood sample on 5 different days in a pathology laboratory is given below. Find the average platelets counts per patient.

Marks	CO #	Blooms Level
5	CO1	K1
5	CO1	K2

Days	1	2	3	4	5
Platelets (in lack/mm <sup>3</sup> )	0.50	0.75	1.00	1.50	2.00
No. of patients	65	80	95	90	70

(OR)

- c. The following table gives the marks obtained by 50 students in biostatistics. Find the median.

5	CO2	K2
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Marks obtained	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
No. of students	4	6	10	5	7	3	9	6

- d. Calculate the mode of the following frequency distribution.

5	CO2	K2
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Item (x)	4	5	6	7	8	9	10	11	12	13
(f)	2	5	8	9	12	14	14	15	11	13

- 3.a. Find out the coefficient of mean deviation of observation on the weight (in pound) of a new born baby as. 9, 12, 10, 11, 8, 13, 11, 12, 10, 11, 12, 12, 8, 11 and 16

5	CO3	K3
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- b. Find the standard deviation of IQ of 68 students of the following data.

5	CO3	K3
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IQ (x)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students (f)	5	12	15	20	10	4	2

(OR)

- c. A researcher collects the data on weight and length of fishes. find out which of the two charters is more variable.

5	CO3	K2
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Fish	Mass	Standard deviation
Weight	350gm	12gm
Length	16 inches	1.5 inches

- d. 120 patients tested their blood for total platelet count from two labs A and B. The following results were obtained,  
 Lab A: Mean = 46.83      Mode = 51.67       $\sigma = 14.8$   
 Lab B: Mean = 47.83      Mode = 47.07       $\sigma = 14.8$   
 Determine the which the laboratory is more skewed.      5      CO4      K4
- 4.a. Describe and prove the additional theorem of probability.      5      CO4      K3  
 b. A bag contains 30 balls numbered from 1-30. One ball is drawn at random. Find the probability that the number of balls drawn will be a multiple of 3 or 7.      5      CO4      K2
- (OR)
- c. Calculate the correlation coefficient of x & y as the values given in the table      5      CO4      K2
- |   |    |    |    |    |    |
|---|----|----|----|----|----|
| X | 5  | 9  | 13 | 17 | 21 |
| Y | 12 | 20 | 25 | 33 | 35 |
- d. Find the probability of drawing a queen, a king and a diamond in that order from a pack of cards in three consecutive draws, the cases down not being replaced.      5      CO4      K3
- 5.a In a correlation study the following values are obtained.      10      CO5      K2
- |           |     |     |     |
|-----------|-----|-----|-----|
| Parameter | X   |     | Y   |
| Mean      | 65  |     | 67  |
| SD        | 2.5 |     | 3.5 |
| r         |     | 0.8 |     |
- Find the two regression equations are associated with the above values.  
 (OR)
- b To increase in weight in kg of 10 students of a certain age group in a school fed with food supplements X and observed as 5, 2, 6, -1, 0, 4, 3, -2, 1 and 4. Similarly, 12 students of the same age group but another's school fed with another food supplement Y and the increase in weight in kg in same period were assessed as 2,8, -1,5,3,0,6,1, -2,4 and 5  
 Is the effect of two food supplements are same?      10      CO5      K3
- 6.a. In a sample survey of public opinion for favors of sale of product and opinion of product is given below. Find out that whether the option on the sale of product is dependent on individual opinion.      5      CO5      K2
- |       |     |    |       |
|-------|-----|----|-------|
|       | Yes | No | Total |
| Yes   | 56  | 31 | 87    |
| No    | 18  | 6  | 24    |
| Total | 74  | 37 | 111   |
- b. The pulse rate of man due to the effect of a medicine on different days on a month was found to be 66, 65, 69, 70, 69, 71, 63, 70, 64 and 68. Discuss whether the mean pulse rate of man in the month is 65.      5      CO6      K1
- (OR)
- c. In electric bulb manufacturing company noticed 2% bulbs are defectives. Find the probability that a sample of 100 bulbs will have no defectives ( $e^x = 0.05$ )      5      CO6      K2
- d. Given the following results of height and weight of 1000 students      5      CO6      K3  
 $\bar{y} = 68$  inches,  $\bar{X} = 150$ -pound,  $r = 0.60$ ,  $\sigma Y = 25$ ,  $\sigma X = 10$  Kg  
 Amit weights 100, Sumit is 5 feet. Estimate the height of Amit from its weight and weight of Sumit from its heights.

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