Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)

B. Tech (Third Semester – Regular & Supplementary) Examinations, November 2025

23BCMBS23001/23BCDBS23001– Applied Statistics

(CSE(AIML)/ CSE(DS))

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

	Question	CO #	Blooms Level
a.	What do you mean by stem and leaf plot?	CO1	K1
b.	Explain about skewness.	CO2	K1
c.	What do you mean by stratified sampling? Give an example.	CO3	K2
d.	What is the meaning of unbiased estimator?	CO4	K1
e.	Define Type I and Type II errors.	CO5	K2

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions (Marks | CO # | Blooms Level)

2. a. In a sample study about coffee habit in two towns, the following information was received: **Town A:** Females were 40%; Total coffee drinkers were 45% and Males non-coffee drinkers were 20%. **Town B:** Males were 55%; Males non-coffee drinkers were 30% and Females coffee drinkers were 15%. Present the above data in a suitable form. — 5 | CO1 | K3

b. Draw the box plot of the following data:
53, 42, 39, 35, 18, 63, 65, 52, 46, 15, 22, 40 — 5 | CO1 | K2

(OR)

c. Distinguish between primary and secondary data and discuss various methods of collecting primary data. — 5 | CO1 | K3

d. In 1995 out of total 2000 workers in a factory, 1550 were members of a trade union. The number of women workers employed was 250, out of which 200 did not belong to any trade union. In 2000, the number of union workers was 1725 of which 1600 were men. The number of non–union workers was 380, among which 155 were women. Present the above information's in tabular form. — 5 | CO1 | K2

3.a. Calculate the mean and standard deviation from the following data: — 5 | CO2 | K3

Value	90-99	80-89	70-79	60-69	50-59	40-49	30-39
Frequency	2	12	22	20	14	4	1

b. Prove that the sum of the squares of deviations of the given set of observations is minimum when taken from the arithmetic mean. — 5 | CO2 | K2

(OR)

c. Find the Inter Quartile Range, Quartile Deviation and Coefficient of Quartile Deviation. — 5 | CO2 | K2

Class	0-15	15-30	30-45	45-60	60-75	75-90	90-105
Frequency	8	26	30	45	20	17	4

d. Prove that the algebraic sum of the deviations of the given set of observations — 5 | CO2 | K2 from their arithmetic mean is zero.

4.a.	Let T_1 and T_2 be considered estimator of u_1 and u_2 respectively. Prove that aT_1+bT_2 is a constant estimator of $a\mu_1+b\mu_2$, where a & b are constants and independent of population.	5	CO3	K2
b.	Out of 20000 customer saving account a sample of 600 account was taken to test the accuracy of hosting and balancing where in 45 mistakes were found assign limits with in no of defective case can be expected 95% level. Find out the confidential limit for 95% significant level.	5	CO3	K3
	(OR)			
c.	If x_1, x_2 & x_3 constitute a random sample of size 3 from normal population with mean μ and variance σ^2. Find the efficiency of $(x_1+2x_2+x_3)/5$ related to $(x_1+x_2+x_3)/4$.	5	CO3	K2
d.	The mean and variance of a random sample of 64 observation were computed as 160 and 100 respectively. Compute the 95% and 99% confidence limits for population.	5	CO3	K2
5.a.	What do you mean by Hypothesis testing? Explain about Null Hypothesis and Alternative Hypothesis.	4	CO4	K3
b.	A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Can the die be regarded as unbiased?	6	CO4	K2
	(OR)			
c.	Discuss briefly the importance of estimation theory in decision making in the face of uncertainty.	4	CO4	K3
d.	In sample 400 parts manufactured by a factory, the number of defective parts was found to be 30. The company, however, claimed that atmost 5% of their product is defective. Is the claim tenable?	6	CO4	K3
6.a.	The mean yield of 2 sets of plots and their variability are as given below. Examine whether the difference in the variability in the yields in significance at 5% level of significance.	6	CO5	K2

	Set of 40 plots	Set of 60 plots
Mean Yield per plot	1258 lb	1243 lb
S.D per plot	34	28

b.	Discuss the large sample test for testing the equality of two population means.	4	CO5	K3
	(OR)			
c.	In a random sample of 500 men 300 are found to be smokers. In another random sample of 1000 men 550 are found to be smokers. Do the data indicate that the two set of men are significantly different with respect to the prevalence of smoking among men	5	CO5	K2
d.	A simple sample of heights of 6,400 Englishmen has a mean of 67.85 inches and a standard deviation (s.d.) of 2.56 inches, while a simple sample of heights of 1,600 Indians has a mean of 68.55 inches and a s.d. of 2.52 inches. Does the data indicate that Indians are on the average taller than Englishmen?	5	CO5	K3

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