


Name:			
Enrolment No:			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, December 2022</b>			
<b>Course: Applied Statistics</b> <b>Program: B.Tech.-H-CSE-Spz-AI&amp;ML</b> <b>Course Code: CSBA 2010</b>		<b>Semester: III</b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions:</b> Attempt all the questions			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.		Marks	CO
Q 1	A dice is thrown 9000 times and a throw of 3 or 4 is observed 3240 times. Show that the dice cannot be regarded as an unbiased one and find the limits between which the probability of a throw of 3 or 4 lies.	4	CO3
Q 2	A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each color.	4	CO1
Q 3	A continuous random variable X has the probability density function: $g(x) = C + Dy, 0 \leq y \leq 1$ . If the mean of the distribution is $\frac{1}{2}$ , find C and D.	4	CO2
Q 4	Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y): X: 65   66   67   67   68   69   70   72 Y: 67   68   65   68   72   72   69   71	4	CO4
Q 5	If four squares are chosen at random on a chess-board, find the chance that they should be in a diagonal line.	4	CO1
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	Two fair dice are thrown independently. Three events A, B and C are defined as follows: A: Odd face with first dice B: Odd face with second dice C: Sum of points on two dice is odd. Are the events A, B and C mutually independent?	10	CO1
Q 7	In a sample of 1000 people in Uttarakhand, 540 are rice eaters and the rest are wheal eaters. Can we assume that both rice and wheat are equally popular in this State at 1% level of significance?	10	CO4
Q 8	For a group of 200 candidates, the mean and standard deviation of scores were found to be 40 and 15 respectively. Later on it was discovered that the scores 43 and 35 were misread as 34 and 53 respectively. Find the	10	CO2

	corrected mean and standard deviation corresponding to the corrected figures.		
Q 9	Two populations have their means equal, but S.D. of one is twice the other. Show that in the samples of size 2000 from each drawn under simple sampling conditions, the difference of means will, in all probability, not exceed $0.15\sigma$ , where $\sigma$ is the smaller S.D. What is the probability that the difference will exceed half this amount?	<b>10</b>	<b>CO3</b>
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>			
Q 10	In a partially destroyed laboratory record of an analysis of correlation data, the following results only are legible: Variance of X = 9. Regression equations: $8X - 10Y + 66 = 0$ , $40X - 18Y = 214$ . What were i. the mean values of X and Y, ii. the correlation coefficient between X and Y, and iii. the standard deviation Y?	<b>20</b>	<b>CO4</b>
Q 11	A random variable X has the probability law: $dF(x) = \frac{x}{b^2} \exp(-\frac{x^2}{2b^2}) dx$ , $0 \leq x < \infty$ . Find the distance between the quartiles and show that the ratio of this distance to the standard deviation of X is independent of the parameter 'b'.  <b>OR</b>  Twenty people were attacked by a disease and only 18 survived. Will you reject the hypothesis that the survival rate, if attacked by this disease, is 85% in favor of the hypothesis that it is more, at 5% level? (Use Large Sample Test.)	<b>20</b>  <b>OR</b>  <b>20</b>	<b>CO2</b>  <b>OR</b>  <b>CO3</b>