Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Applied Statistical Analysis **Semester: III**
Program: B.Tech.-H-CSE-Spz-BAO/
B.Tech.-H-CSE-Spz-BAO **Time: 03 hrs.**
Course Code: CSBA 2009 **Max. Marks: 100**

Instructions: Attempt all the questions

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	In an Examination in statistics, five students obtained the following marks in a certain paper: A B C D E 3 6 9 12 15 Find Arithmetic mean and standard deviation of these marks.	**4**	**CO1**
Q 2	What is Neural Network, explain with example.	**4**	**CO4**
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**	**CO3**
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**

SECTION B
(4Qx10M= 40 Marks)

Q 6	In a certain factory turing out razor blades, there is a small chance of 1/500 for any blade to be defective. The blades are supplied in a packet of 10. Use poisson distribution to calculate the approximate number of packets containing no defective, one defective, two defective and three defective blades in a consignment of 10,000 packets. [Given $e^{-0.02} = 0.9802$]	**10**	**CO2**
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 corrected mean and standard deviation corresponding to the corrected figures.	**10**	**CO2**
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 0.15σ, where σ is the smaller S.D. What is the probability that the difference will exceed half this amount? OR Distinguish between a null hypothesis and an alternate hypothesis. Use an example to explain the nature of null and alternate hypothesis in cases of one and two tailed tests.	**10**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
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?	**20**	**CO4**
Q 11	A random variable X has the probability law: $dF(x) = \frac{x}{b^2}\exp(-\frac{x^2}{2b^2})dx,\ 0 \le x < \infty.$ 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'. **OR** 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.)	**20** **OR** **20**	**CO2** **OR** **CO3**