**ASSIGNMENT(Last Date: 10th March)**

**Instructions:**

* **Maximum marks:** 10 (select the questions accordingly, extra questions will not be considered)
* Solve the questions manually , scan and upload in canvass. Mention the BITS ID without fail on the assignment.
* Individual submissions only.
* Plagiarism results in zero marks.

1. Normal Distribution: [ 2 Marks]
2. Discuss the importance of Normal Distribution in Data Science with one or two applications?
3. Find the mean and variance of Normal Distribution
4. Discrete Random Variable [ 3 Marks]

A random variable has the following distribution

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| P(x) | k | 3k | 5k | 7k | 9k | 11k | 13k | 15k | 17k |

1. Find the value of k
2. Find P( X < 4) , P( 0 < x < 4)
3. Find the smallest value of x for which P( X less then or equal to k) > 0.5?
4. Joint Distribution [ 2 Marks]

Suppose X and Y has the joint density

f(x, y) = 6xy(2 – x – y), 0 < x <1 , 0 < y < 1,then find E(X /Y = y).

1. Testing of Hypothesis [ 3 Marks]

The mean produce of rice of sample of 150 fields yields is 200 quintals with a standard deviation of 12 quintals. Another sample of 100 fields gives the mean at 200 quintals with a SD of 10 quintals. Assuming the standard deviation of the mean field at 11 quintals for the universe, test whether the results are consistent at 1% level of significance.

1. Testing of Hypothesis [2 Marks]

In a city A, out of 600 men, 325 men were found to be smokers. Does this information support the statement” Majority of men in city are smokers”?

1. Testing of Hypothesis [ 5 Marks]

Following are the details of sales ( in Lakhs) done by A,B and C. Test for the significant difference in their performance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sales Men** | **Monthly Sales** | | | |
| A | 48 | 49 | 50 | 49 |
| B | 47 | 49 | 48 | 48 |
| C | 49 | 51 | 50 | 50 |

1. Consider the following data:[5 Marks]

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 3 | 5 | 7 | 5 | 6 | 7 | 9 | 4 | 8 | 6 |
| Y | 6 | 9 | 12 | 10 | 14 | 12 | 14 | 8 | 15 | 10 |

1. Discuss the relation between X and Y using an appropriate method.
2. If possible, try to find the relation between X and Y treating X as independent variable?

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