FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES
4th SEMESTER B.TECH PROGRAMME
PROBABILITY, STATISTICS AND NUMERICAL METHODS (203191251)
ACADEMIC YEAR 2021-2022

Assignment 1

1. Find the coefficient of Correlation between x and y.

X	60	62	64	66	68	70	72
y	61	63	63	63	64	65	67

2. The sale and expenditure of 10 companies are given below. Find the coefficient of Correlation between sale and expenditure.

Sale	50	55	55	60	65	65	65	60	60	50
Expenditure	11	13	14	16	16	15	15	14	13	13

3. Find the coefficient of rank correlation.

X	52	53	42	60	45	41	37	38	25	27
Y	65	68	43	38	77	48	30	32	25	50

4. Two ladies were asked to rank 7 different types of lipsticks. The rank given by them are as follows. Find the Spearman's Rank Correlation Coefficient.

Lipsticks	A	B	C	D	E	F	G
Rank given by Neelu	2	1	4	3	5	7	6
Rank given by Neena	1	3	2	4	5	6	7

5. Find the equation of regression lines from the following data and also estimate y for x = 1 and x for y = 4.

X	3	2	-1	6	4	-2	5	7
y	5	13	12	-1	2	20	0	-3

6. Find the following information obtain two regression lines. Also estimate y when x=10.

	X	Y
Mean	7.5	12.5
Standard deviation	4.5	9
Correlation coefficient	0.9	

7. From the following table calculate the coefficient of correlation by Karl Pearson's method. Arithmetic means of X and Y series are 6 and 8 respectively.

X	6	2	10	4	8
Y	9	11	?	8	7

8. Find the most likely Production corresponding to a Rainfall 40" from the following data

	Rainfall	Production
Average	30"	500 kg
Standard deviation	5"	100 kg
Coefficient of correlation	0.8	

9. The Probability distribution of a random variable x is as follows:

x_i	0	1	2	3	4
$P(x_i)$	1/10	P	3/10	p	1/10

(i) Find the value of p.
(ii) Find $E(x+1)$

<table>
<tr><td>10</td><td>If V(km/hr) and R(kg/tonne) are related by a relation of the type $R = a + bV^2$, find by the method of least squares, a and b with the help of following table.
<table>
<tr><td>V</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td></tr>
<tr><td>R</td><td>8</td><td>10</td><td>15</td><td>21</td><td>30</td></tr>
</table></td></tr>
<tr><td>11</td><td>For a Binomial distribution n=5 and $P(x = 1) = P(x = 2)$, find $P(x = 3)$.</td></tr>
<tr><td>12</td><td>The prior for event A_1, A_2, A_3 are $P(A_1)=0.20$ $P(A_2)=0.50$ $P(A_3)=0.30$ the conditional probability of B given A_1, A_2, A_3 are $P(B|A_1)=0.50$ and $P(B|A_2)= 0.40$, and $P(B|A_3)= 0.30$ Use Bayes' theorem to compute $P(A_1|B)$.</td></tr>
<tr><td>13</td><td>The average weight of 1000 boys of a college is 52 kg and its S.D. is 3 kg. Assuming the weight to be normally distributed, find the number of boys with weights between 48 and 53kg.</td></tr>
<tr><td>14</td><td>In a company during a break time of half an hour on average 15 calls are coming. Find the probability that there are at least 2calls per 5 minutes.</td></tr>
<tr><td>15</td><td>The probability that a student appearing in certain exam will pass is 0.7. find the probability that out of 6 randomly selected students, only 2 students will pass.</td></tr>
<tr><td>16</td><td>On an average 1.5 percent of electric bulbs are found to be defective in a bulb manufacturing factory. Using Poisson distribution find the probability of 4 defective bulbs in a box of 200 bulbs.(e^{-3}=0.0498)</td></tr>
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