



**FACULTY OF ENGINEERING AND
TECHNOLOGY DEPARTMENT OF APPLIED
SCIENCES AND HUMANITIES
4th SEMESTER B.TECH PROGRAMME
PROBABILITY, STATISTICS AND NUMERICAL METHODS
(303191251)
ACADEMIC YEAR 2023-2024**

Assignment

Q-1	Solve the following.											
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.	Fit straight line using least square method											
	x	0	0.5	1	1.5	2	2.5					
	y	0	1.5	3	4.5	6	7.5					
3.	Two judges have given ranks to 10 students to their honesty. Find rank correlation coefficient for the following data:											
	1st Judge	3	5	8	4	7	10	2	1	6	9	
	2nd Judge	6	4	9	8	1	2	3	10	5	7	
4.	Find the correlation coefficient between the length and weight:											
	Length in inches			3	4	6	7	10				
	Weight in kilo gram			9	11	14	15	16				
5.	Find the coefficient of rank correlation.											
	X	35	40	42	43	40	53	54	49	41	55	
	Y	102	101	97	98	38	101	97	92	95	95	
6.	The following table shows the ages(X) and blood pressure(Y) of 8 persons.											
	X	52	63	45	36	72	65	47	25			
	Y	62	53	51	25	79	43	60	33			
	Obtain the regression Y on X. Find the expected blood pressure of a person who is 49 years old.											
7.	You are given the following data. Find regression coefficients .											
						X	Y					
	Arithmetic Mean					36	85					
	Standard Deviation					11	8					

	Correlation between X and Y	0.66			
8.	Fit the exponential curve $y=a e^{bx}$ to the following data:				
	x	2	4	6	8
	y	25	38	56	84
9.	A card is drawn from a pack of well- shuffled cards. Find the probability of the following events.(i) The card drawn is a king.(ii) The card drawn is a face card.(iii) The card drawn is a spade				
10.	Weight of 4000 students of the university is normally distributed with average weight of 95 pounds and standard deviation of 7.5 pounds(i)How many students having weight between 100 pounds to 110 pounds(ii) How many students having weight more than 110 pounds. ($P(z=2)=0.4772$, $p(z=0.667)=0.2486$)				
11.	In a pharmaceutical factory, machines A and B manufacture 40% and 60% of the total output. Of this production of tablets, machines A and B produce 5% and 10% defective tablets. A tablet is picked at random and is found to be defective. What is the probability that the tablet was produced by the machine A?				
12.	Three unbiased coins are tossed. Find the probability of getting (i) exactly 2 heads, (ii) at least one tail, (iii) at most 2 heads.				
13.	An unbiased coin is tossed 6 times. Find the probability of getting (i) exactly 4 heads (ii) at least 4 heads.				
14.	An urn contains 3 red and 7 white balls. A ball is drawn at random from the urn and in its place a ball of other colour is put. If now one ball is drawn from the urn, find the probability that it is red.				
15.	The following table shows the probabilities of blood types in the general population				
		A	B	AB	O
	Rh +	34%	9%	4%	38%
	Rh -	6%	2%	1%	6%
	a. What is the probability a person will have type O blood?				
	b. What is the probability a married couple will both be Rh - ?				
	c. What is the probability a person will have type B blood given he or she is Rh+?				
16.	A sample of 900 members is found to have a mean of 3.4cm. Can it be reasonably regarded a simple sample from a population with mean 3.25cm and S.D. 2.61cm?				
17.	The following information is about the heights of students of two colleges				
		College A		College B	
	Mean height (in inches)	67.42		67.25	

	S.D. (in inches)	2.58	2.50														
	Sample size	1000	1200														
	Is the difference in mean is significant?																
18.	Two independent sample are drawn from two different populations. The information is given below: <table><tr><td>Sample size</td><td>Mean</td><td>S.D</td></tr><tr><td>100</td><td>1200</td><td>240</td></tr><tr><td>200</td><td>900</td><td>220</td></tr></table> Test whether the variability of life of bulbs of the factories significantly differ.			Sample size	Mean	S.D	100	1200	240	200	900	220					
Sample size	Mean	S.D															
100	1200	240															
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19.	Ten students are selected at random from a collage and their heights are found to be 100,104,108,110,118,120,122,124,126 and 128 cms. In the light of these data, discuss the suggestion that the mean height of the college students of the collage is 110 cms.																
20.	Five coins are tossed for 320 times and the following distribution of number of heads is obtained <table><tr><td>Number of heads:</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Frequency:</td><td>8</td><td>42</td><td>116</td><td>90</td><td>52</td><td>12</td></tr></table> Test the hypothesis that the coin is unbiased.			Number of heads:	0	1	2	3	4	5	Frequency:	8	42	116	90	52	12
Number of heads:	0	1	2	3	4	5											
Frequency:	8	42	116	90	52	12											
21.	Construct Newton's forward interpolation Polynomial for the following data: <table><tr><td>X:</td><td>4</td><td>6</td><td>8</td><td>10</td></tr><tr><td>Y:</td><td>1</td><td>3</td><td>8</td><td>16</td></tr></table>			X:	4	6	8	10	Y:	1	3	8	16				
X:	4	6	8	10													
Y:	1	3	8	16													
22.	Find the real root of the equation $x \log_{10} x = 1.2$ lies between 2 and 3 using bisection method, correct up to three decimal places.																
23.	Find the real root of the equation $x^4 - x - 4 = 0$ using bisection method, correct up to four decimal places.																
24.	Find the real root of the equation $xe^x = 2$ using Regula – Falsi method, correct up to three decimal places.																
25.	Find the real root of the equation $2x - 3\sin x - 5 = 0$, correct up to four decimal places using Newton – Raphson method.																
26.	Find the value of $\sqrt{20}$ correct up to two decimal places by Newton – Raphson method.																
27.	Derive a Newton – Raphson iteration formula for finding the cube root of a positive number N. Hence find $\sqrt[3]{12}$																
28.	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ with $n = 6$ using Trapezoidal rule.																
29.	Evaluate $\int_0^1 \frac{x^2}{1+x^3} dx$ using Simpson's one – third rule and compare with the exact value.																
30.	Evaluate $\int_0^3 \frac{1}{1+x} dx$, with $n = 6$ using Simpson's 3/8 rule																
31.	Using Euler's method, find $y(0.1)$ for given IVP $\frac{dy}{dx} = \frac{y-x}{y+x}$ with $y(0) = 1$																

32.	Find $y(0.2)$ for $\frac{dy}{dx} = xy + y^2, y(0) = 1$ by second order R – K method by choosing $h = 0.1$					
33.	Find the real root of the equation $x^6 - x^4 - x^3 - 1 = 0$ using method of false position, correct up to three decimal places					
34.	The Population of town is given below. Estimate the population for the year 1895 and 1930 using suitable interpolation.					
	Year(X):	1891	1901	1911	1921	1931
	Population(Y):	46	66	81	93	101
35.	Determine $y(12)$ by using Lagrange's interpolation method from the following data:					
	X:	11	13	14	18	20
	Y:	25	47	68	82	102