

SECTION B

Attempt any seven questions		(5x7)																							
Q 3	Find the probabilities that a random variable having the standard normal distribution, will take on values, (i) Between -1.2 and 1.45 (ii) Greater than 4.5 (iii) Less than 2.74 (iv) Greater than -2.5		CO2																						
Q 4	A small industry is interested in analyzing the effects of advertising on its sales. Over a 5-month period ,it finds the following results: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X</td> <td>5</td> <td>8</td> <td>10</td> <td>15</td> <td>22</td> </tr> <tr> <td>Y</td> <td>6</td> <td>15</td> <td>20</td> <td>30</td> <td>39</td> </tr> </table> Where X represents the money spent on advertising (in hundreds) and Y represents the total sales(in thousands) . Use these data to determine the correlation coefficient.	X	5	8	10	15	22	Y	6	15	20	30	39		CO3										
X	5	8	10	15	22																				
Y	6	15	20	30	39																				
Q 5	The average and variance of 20 items were calculated by a student as 40 and 36 respectively. But at the time of checking it is found that an item which is 25 is wrongly copied as 30. Find the corrected mean and standard deviation.		CO2																						
Q 6	Functions f and g are defined by $f(x) = 1/x + 3x \quad \text{and} \quad g(x) = -1/x + 6x - 4$ Find find $(f + g)(x)$ and $(f / g)(x)$. Also find $(f / g)(2)$ and $(f + g)(1)$		CO2																						
Q 7	The following are daily wages (in Rs) of 95 employees in a firm. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Wages</th> <th>No. of employees</th> </tr> </thead> <tbody> <tr><td>0-10</td><td>5</td></tr> <tr><td>10-20</td><td>4</td></tr> <tr><td>20-30</td><td>8</td></tr> <tr><td>30-40</td><td>12</td></tr> <tr><td>40-50</td><td>16</td></tr> <tr><td>50-60</td><td>25</td></tr> <tr><td>60-70</td><td>10</td></tr> <tr><td>70-80</td><td>8</td></tr> <tr><td>80-90</td><td>5</td></tr> <tr><td>90-100</td><td>2</td></tr> </tbody> </table> Draw ogive of both types and compare the median you get using ogive with the earlier one.	Wages	No. of employees	0-10	5	10-20	4	20-30	8	30-40	12	40-50	16	50-60	25	60-70	10	70-80	8	80-90	5	90-100	2		CO4
Wages	No. of employees																								
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70-80	8																								
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90-100	2																								

Q 8	How inferential statistics is different from descriptive satatistics? Explain with example.		CO1																
Q 9	<p>Automobile travelling on the New York State Thruway are checked for speed by a state police radar system. Following is a frequency distribution of speeds:</p> <table border="1"> <thead> <tr> <th>Speed(Miles per hour)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>45-49</td> <td>12</td> </tr> <tr> <td>50-54</td> <td>43</td> </tr> <tr> <td>5-59</td> <td>155</td> </tr> <tr> <td>60-64</td> <td>180</td> </tr> <tr> <td>65-69</td> <td>75</td> </tr> <tr> <td>70-74</td> <td>20</td> </tr> <tr> <td>75-79</td> <td>15</td> </tr> </tbody> </table> <p>What is the mean speed of the automobiles travelling on the New York State Thruway? Also find any two measures of skewness and comment on the nature of data.</p>	Speed(Miles per hour)	Frequency	45-49	12	50-54	43	5-59	155	60-64	180	65-69	75	70-74	20	75-79	15		CO4
Speed(Miles per hour)	Frequency																		
45-49	12																		
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Q 10	A problem in QM is given to 5 students. Their chances of solving it are $1/2, 1/5, 1/6, 1/7, 1/8$. What is the probability that the problem will be solved?		CO2																

SECTION-C

	Attempt any four questions	(12.5x4)															
Q 11	<p>The relation between price and demand of a comodite is as follows:</p> <table border="1"> <tbody> <tr> <td>Demand</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>2</td> <td>1</td> </tr> <tr> <td>Price</td> <td>4</td> <td>6</td> <td>5</td> <td>6</td> <td>8</td> <td>9</td> </tr> </tbody> </table> <p>Find line of regression. And also find price when demand is 3 unit.</p>	Demand	10	8	5	4	2	1	Price	4	6	5	6	8	9		CO3
Demand	10	8	5	4	2	1											
Price	4	6	5	6	8	9											
Q 12	<p>In two sets of variables X and Y with 50 observations each, the following data were observed:</p> <p>Mean of X= 10 , S.D. of X = 3, Mean of Y= 6, S.D. of Y = 2 and $r(X,Y) = 0.3$</p> <p>But on subsequent verification it was found that one value of X(=10) and one value of Y(=6) were inaccurate and hence weeded out.How is the orginal value of r affected?</p>		CO3														

Q 13 The following are the time taken by the police department on receipt of the complaint to find the culprit.

5,20,23,45,123,8,2,15,74,19,110,26,5,12,20,23,68,29,25,1,14,110,79,85,92,95,62,40,45,23,29,35,7,14,24,19,33,34,36,40,82,72,83,107,114,93,84,65,77,92,80,24,62,72,49,62,58,60,74

Construct discrete and continuous frequency distribution (both inclusive and exclusive) table.

CO2

Q 14 Answer the followings based on output of regression

Regression Statistics	
Multiple R	0.995525705
R Square	0.991071429
Adjusted R Square	0.985119048
Standard Error	0.263523138
Observations	6

ANOVA					
	df	SS	MS	F	Significance F
Regression	2	23.125	11.5625	166.5	0.000843671
Residual	3	0.208333333	0.069444		
Total	5	23.33333333			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	36.66666667	3.802107116	9.643775	0.002367	24.56666492	48.766668	24.56666492	48.76666841
x	9.875	0.972718127	10.15196	0.002036	6.779376789	12.970623	6.779376789	12.97062321
y	-18.125	1.920738429	-9.43647	0.002522	-24.23764692	-12.01235	-24.2376469	-12.01235308

(i) What is the role of ANOVA in regression model?
(ii) Write down the regression model.
(iii)What is the role of p value in regression model?

CO3

Q 15

During the year 2016, oil consumption was 30 million barrels per day. The following data represent the percentage breakdown of the sources of that consumption.

Source of consumption	% Usage
Electric utilities	15
Highway transportation	35
House, industry & business	20
Misc.	30

Total	100

- i) Construct a appropriate bar chat
- ii) Construct a pie chart
- iii) Which of these charts is preferable and why?

CO2