



VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Fall Semester - 2019~2020

Continuous Assessment Test - I

Programme Name & Branch : B.Tech. / M.Tech.

Slot : B1+TB1

Maximum Marks : 50

Course Code & Name : MAT2001 - Statistics for Engineers
Exam Duration : 90 Minutes

Answer ALL the Questions

Each question carries equal marks ($5 \times 10 = 50$ Marks)

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S. No.	Questions	Marks																																	
1.	<p>Given below is the distribution of 140 candidates obtaining marks X and cumulative frequency (c.f.) of X.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"><tr><td>X:</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td></tr><tr><td>c.f. :</td><td>140</td><td>133</td><td>118</td><td>100</td><td>75</td><td>45</td><td>25</td><td>9</td><td>2</td><td>0</td></tr></table> <p>Calculate the mean, median and mode for the distribution.</p>	X :	10	20	30	40	50	60	70	80	90	100	c.f. :	140	133	118	100	75	45	25	9	2	0	[10]											
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c.f. :	140	133	118	100	75	45	25	9	2	0																									
2.	<p>Calculate the mean, variance and standard deviation for the following frequency distribution, and hence obtain the value of co-efficient of variation.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"><tr><td>X:</td><td>20-25</td><td>25-30</td><td>30-35</td><td>35-40</td><td>40-45</td><td>45-50</td><td>50-55</td><td>55-60</td><td>60-65</td></tr><tr><td>f:</td><td>35</td><td>165</td><td>215</td><td>185</td><td>145</td><td>105</td><td>75</td><td>65</td><td>45</td></tr></table>	X :	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	f :	35	165	215	185	145	105	75	65	45	[10]													
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3.	<p>If the random variable X takes the values 1, 2, 3 and 4 such that $2P(X = 1) = 3P(X = 2) = P(X = 3) = 5P(X = 4)$, find the probability distribution function and cumulative distribution function of X.</p>	[10]																																	
4.	<p>If the joint density for the random variables (X, Y), where X is the unit temperature change and Y is the proportion of spectrum shift that a certain atomic particle produces, is given by</p> $f(x, y) = \begin{cases} cxy^2, & 0 < x < y < 1; \\ 0, & \text{otherwise,} \end{cases}$ <p>then find (i). the value of c, (ii). $f_{Y/X}(x/y)$, (iii). $f_X(x)$, (iv). $f_Y(y)$.</p>	[10]																																	
5.	<p>Ten competitions in a beauty contest were ranked by three judges A, B, C as follows:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"><tr><td>A:</td><td>6</td><td>5</td><td>3</td><td>10</td><td>2</td><td>4</td><td>9</td><td>7</td><td>8</td><td>1</td></tr><tr><td>B:</td><td>5</td><td>8</td><td>4</td><td>7</td><td>10</td><td>2</td><td>1</td><td>6</td><td>9</td><td>3</td></tr><tr><td>C:</td><td>4</td><td>9</td><td>8</td><td>1</td><td>2</td><td>3</td><td>10</td><td>5</td><td>7</td><td>6</td></tr></table> <p>Discuss which pair of judges have the nearest approach to common taste of beauty.</p>	A :	6	5	3	10	2	4	9	7	8	1	B :	5	8	4	7	10	2	1	6	9	3	C :	4	9	8	1	2	3	10	5	7	6	[10]
A :	6	5	3	10	2	4	9	7	8	1																									
B :	5	8	4	7	10	2	1	6	9	3																									
C :	4	9	8	1	2	3	10	5	7	6																									



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