K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)
Semester: **January –May 2021**
In-Semester Examination

Class: SY B. Tech
Branch: Computer **Semester: IV**
Full name of the course: Probability, Statistics & Optimization Techniques **Course Code: 2UCC401**
Duration: 1hr.15 min (attempting questions) **Max. Marks: 30**
+15 min (uploading)

<table>
<tr><th>Q. No</th><th></th><th>Questions</th><th>Marks</th></tr>
<tr><td rowspan="5">Q1</td><td>1.1</td><td>From the following probability distribution table, find the constant k
<table><tr><td>X</td><td>0</td><td>10</td><td>15</td></tr><tr><td>P(X=x)</td><td>(k-6)/5</td><td>2/k</td><td>14/5k</td></tr></table>(a) 8 (b) 3 (c) 5 (d) 7</td><td rowspan="5">10 marks
(2 Mark Each)</td></tr>
<tr><td>1.2</td><td><table><tr><td></td><td>Y=2</td><td>Y=4</td><td>Y=5</td></tr><tr><td>X=1</td><td>1/12</td><td>1/24</td><td>1/24</td></tr><tr><td>X=2</td><td>1/6</td><td>1/12</td><td>1/8</td></tr><tr><td>X=3</td><td>1/4</td><td>1/8</td><td>1/12</td></tr></table>Find conditional prob $P(X \leq 2/Y = 4)$
(a) 1/8 (b) 1/4 (c) 1/2 (d) 1/6</td></tr>
<tr><td>1.3</td><td>Find coefficient of correlation if line of regression of y on x is 10y — 6x= 80 and line of regression of x on y is 7y — 10x = 2
(a) 0.42 (b) 0.60 (c) 0.69 (d) – 0.60</td></tr>
<tr><td>1.4</td><td>The probability that at any moment one telephone line out of 5 will be busy is 0.2. what is the probability that 4 lines are busy?
(a) 0.0064 (b) 0.00128 (c) 0.0819 (d) 0.4096</td></tr>
<tr><td>1.5</td><td>Find 95% confidence interval of the odds ratio for logistic modal is given by $log\left(\frac{p}{1-p}\right) = 0.69x - 0.24$ if value of z for 95% confidence interval is 1.96 and standard error is 0.11.
(a) (0.47, 0.91) (b) (1.61, 2.47)
(c) (-0.46, -0.02) (d) (0.63, 0.98)</td></tr>
<tr><td rowspan="2">Q2</td><td>A</td><td>Find line of regression for the following data to estimate y corresponding to x=155
<table><tr><td>X</td><td>100</td><td>110</td><td>120</td><td>130</td><td>140</td><td>150</td><td>160</td><td>170</td><td>180</td><td>190</td></tr><tr><td>Y</td><td>45</td><td>49</td><td>54</td><td>61</td><td>66</td><td>70</td><td>73</td><td>78</td><td>85</td><td>88</td></tr></table></td><td>5 marks</td></tr>
<tr><td>B</td><td>From the data calculate Karl Pearson’s correlation between x & y.</td><td>5 marks</td></tr>
</table>

		x: 229, 226, 228, 227, 230, 232, 223, 225, 232, 228 y: 250, 261, 236, 259, 234, 263, 264, 267, 250, 256	
		OR	
		Determine the coefficient of rank correlation from the following data- x: 68, 64, 75, 50, 64, 80, 75, 40, 55, 64 y: 62, 58, 68, 45, 81, 60, 68, 48, 50, 70	5 marks
Q3		**Attempt any TWO out of THREE**	(5+5) marks
	A	In a certain college 4% of the boys and 1% of the girls are taller than 1.8 m. Furthermore 40% of the students are girls Now if a student is selected at random and taller than 1.8 m what is probability that the student is girl ?	
	B	In a distribution exactly normal 15% of items are under 45 & 79% are under 61.What are the mean & standard deviation.	
	C	A continuous random variable X has the probability density function $f(x) = ke^{-x}, x \geq 0$. Find k, mean and variance	