

## Sample Question Paper

Branch: SE Computer

Sub. : AM-III

Q1.	<p><i>For the following data</i></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tbody> <tr> <td style="padding: 2px 10px;"><i>X</i></td> <td style="padding: 2px 10px;">2</td> <td style="padding: 2px 10px;">4</td> <td style="padding: 2px 10px;">5</td> <td style="padding: 2px 10px;">6</td> <td style="padding: 2px 10px;">8</td> <td style="padding: 2px 10px;">11</td> <td style="padding: 2px 10px;"></td> <td style="padding: 2px 10px;"></td> </tr> <tr> <td style="padding: 2px 10px;"><i>y</i></td> <td style="padding: 2px 10px;">18</td> <td style="padding: 2px 10px;">12</td> <td style="padding: 2px 10px;">10</td> <td style="padding: 2px 10px;">8</td> <td style="padding: 2px 10px;">7</td> <td style="padding: 2px 10px;">5</td> <td style="padding: 2px 10px;"></td> <td style="padding: 2px 10px;"></td> </tr> </tbody> </table> <p><i>Obtain the rank correlation coefficient</i></p>	<i>X</i>	2	4	5	6	8	11			<i>y</i>	18	12	10	8	7	5		
<i>X</i>	2	4	5	6	8	11													
<i>y</i>	18	12	10	8	7	5													
Option A:	R=0.33																		
Option B:	R=-0.58																		
Option C:	R= -0.92																		
Option D:	R=0.12																		
Q2.	<i>The equations of lines of regressions are <math>6y = 5x + 90</math>, <math>15x = 8y + 130</math> then find means of <math>x</math> and <math>y</math>.</i>																		
Option A:	30, 40																		
Option B:	20, 30																		
Option C:	10, 40																		
Option D:	10, 20																		
Q3.	Find Harmonic conjugate of $u = e^x \cos y$																		
Option A:	$V = -e^x \sin y$																		
Option B:	$V = e^x \sin y$																		
Option C:	$V = -e^x \cos y$																		
Option D:	$V = e^x \cos y$																		
Q4.	Find analytic function whose real part is $u = x^2 - y^2 - 5x + y + 2$																		
Option A:	$F(z) = z^2 + 5z - iz + c$																		
Option B:	$F(z) = z^2 - 5z + iz + c$																		
Option C:	$F(z) = z^2 - 5z - iz + c$																		
Option D:	$F(z) = z^2 + 2z - iz + c$																		
Q5.	Verify given function analytic or not $f(z) = e^z$																		
Option A:	analytic																		
Option B:	Not analytic																		
Q6.	Find $L^{-1} \left[ \log \left( \frac{s+a}{s+b} \right) \right]$																		
Option A:	$\frac{1}{t} (e^{-at} - e^{-bt})$																		

Option B:	$\frac{-1}{t}(e^{-at} - e^{-bt})$																		
Option C:	$\frac{-1}{t}(e^{-at} + e^{-bt})$																		
Option D:	$\frac{-2}{t}(e^{-at} - e^{-bt})$																		
Q7.	Evaluate: $\int_0^{\infty} e^{-3t} \left[ \int_0^t \left( \frac{1-e^{-u}}{u} \right) du \right] dt.$																		
Option A:	log(4/3)																		
Option B:	log(3/2)																		
Option C:	2log(3/4)																		
Option D:	1/3 log(4/3)																		
Q8.	<p>The following data gives HDL and LDL cholesterol levels of 7 adults in a locality:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>HDL</td> <td>52</td> <td>63</td> <td>45</td> <td>36</td> <td>72</td> <td>65</td> <td>45</td> <td>25</td> </tr> <tr> <td>LDL</td> <td>62</td> <td>53</td> <td>51</td> <td>25</td> <td>79</td> <td>43</td> <td>60</td> <td>33</td> </tr> </table> <p>Obtain the rank correlation coefficient</p>	HDL	52	63	45	36	72	65	45	25	LDL	62	53	51	25	79	43	60	33
HDL	52	63	45	36	72	65	45	25											
LDL	62	53	51	25	79	43	60	33											
Option A:	-0.96																		
Option B:	0.95																		
Option C:	0.648																		
Option D:	0.223																		
Q9.	Find Laplace transform of $f(t) = \int_0^t \frac{\sin 2u}{u} du.$																		
Option A:	$\frac{1}{s} \left[ \frac{\pi}{2} - \tan^{-1} \left( \frac{s}{2} \right) \right]$																		
Option B:	$\left[ \frac{\pi}{2} - \tan^{-1} \left( \frac{s}{2} \right) \right]$																		
Option C:	$2 \left[ \frac{\pi}{2} - \tan^{-1} \left( \frac{s}{2} \right) \right]$																		
Option D:	$\frac{2}{s} \left[ \frac{\pi}{2} - \tan^{-1} \left( \frac{s}{2} \right) \right]$																		
Q10.	The equations of lines of regressions are $x + 2y = 5$ and $2x + 3y = -8$ then find means of $x$ and $y$ .																		
Option A:	31,18																		
Option B:	-31, 18																		
Option C:	18, 12																		
Option D:	-18, 12																		
Q11.	The following data find the line of regression and estimate the value of $y$ at $x = 15.5$																		

		X	10	12	13	16	17	20	25	
		Y	19	22	24	27	29	33	37	
Option A:	Y = 0.8x + 13.23; 25.63									
Option B:	Y = 8x + 10.23; 30.63									
Option C:	Y = 0.18x + 13.23; 20.23									
Option D:	Y = 0.8x + 10.23; 22.63									
Q12.	Find $L^{-1}\left(\frac{s^2}{(s^2+1)^2}\right)$ by convolution theorem									
Option A:	$1/2(\sin t - t \cos t)$									
Option B:	$1/2(\sin t + t \cos t)$									
Option C:	$(\sin t + t \cos t)$									
Option D:	$1/2(\sin t + \cos t)$									
Q13.	Find Fourier series for $f(x) = x^2, -\pi < x < \pi$									
Option A:	$x^2 = \frac{\pi^2}{3} + \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} \cos nx$									
Option B:	$x^2 = \frac{\pi}{3} + 4 \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} \cos nx$									
Option C:	$x^2 = \frac{\pi^2}{3} - 4 \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} \cos nx$									
Option D:	$x^2 = \frac{\pi^2}{3} + 4 \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} \cos nx$									
Q14.	Find $L^{-1}\left[\tan^{-1}\left(\frac{a}{s}\right)\right]$									
Option A:	$\sin at/t$									
Option B:	$-\sin at/t$									
Option C:	$\cos at/t$									
Option D:	$-\cos at/t$									
Q15.	Verify $v = e^x \sin y$ is harmonic or not									
Option A:	Harmonic									
Option B:	Not Harmonic									
Q16.	If $f(x) = 2x, 0 \leq x \leq 2\pi$ , then find $a_4$ .									
Option A:	-0.2									

Option B:	0.4														
Option C:	0														
Option D:	3														
Q17.	Find fixed point $w = \frac{3z-5i}{iz-1}$ .														
Option A:	5/i, i														
Option B:	2/i, -i														
Option C:	-1, 1														
Option D:	2i, i														
Q18.	Evaluate $\int_0^{\infty} e^{-3t} \cos^2 t dt$														
Option A:	11/56														
Option B:	12/63														
Option C:	-2/3														
Option D:	11/39														
Q19.	Obtain Fourier series for $f(x)$ , where $F(x) = x + \frac{\pi}{2} \quad \text{for } -\pi < x < 0$ $= \frac{\pi}{2} - x \quad \text{for } 0 < x < \pi.$														
Option A:	$F(x) = 9 + \frac{2}{\pi} \sum_{n=0}^{\infty} \frac{1-(-1)^n}{n^2} \cos nx$														
Option B:	$F(x) = 16 + \frac{2}{\pi} \sum_{n=0}^{\infty} \frac{1-(-1)^n}{n^2} \cos nx$														
Option C:	$F(x) = \frac{4}{\pi} \sum_{n=0}^{\infty} \frac{1-(-1)^n}{n^2} \cos nx$														
Option D:	$F(x) = \frac{2}{\pi} \sum_{n=0}^{\infty} \frac{1-(-1)^n}{n^2} \cos nx$														
Q20.	Fit the straight line to the following data <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>x</math></td> <td>2</td> <td>1</td> <td>3</td> <td>5</td> <td>4</td> <td>3</td> </tr> <tr> <td><math>y</math></td> <td>10</td> <td>12</td> <td>10</td> <td>9</td> <td>8</td> <td>11</td> </tr> </table>	$x$	2	1	3	5	4	3	$y$	10	12	10	9	8	11
$x$	2	1	3	5	4	3									
$y$	10	12	10	9	8	11									
Option A:	$Y = 12.4 + 0.8 x$														
Option B:	$Y = 12.4 - 1.8 x$														
Option C:	$Y = 12.4 - 0.8 x$														
Option D:	$Y = 22 - 0.8 x$														
Q21.	Obtain Half range cosine series for $f(x) = x(\pi-x)$ , in $(0, \pi)$														
Option A:	$X(\pi-x) = \frac{\pi^2}{2} - 4 \sum_{n=odd} \frac{\cos nx}{n^2}$														

Option B:	$\chi(\pi-x) = \frac{\pi^2}{6} - 4 \sum_{n=even} \frac{\cos nx}{n^2}$														
Option C:	$\chi(\pi-x) = \frac{\pi^2}{6} - 4 \sum_{n=odd} \frac{\cos nx}{n^2}$														
Option D:	$\chi(\pi-x) = \frac{\pi^2}{6} + 4 \sum_{n=odd} \frac{\cos nx}{n^2}$														
Q22.	Fit parabola to following data: <table border="1" style="margin-left: 40px;"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>y</td> <td>2</td> <td>3</td> <td>5</td> <td>6.5</td> <td>7</td> <td>8</td> </tr> </table>	x	1	2	3	4	5	6	y	2	3	5	6.5	7	8
x	1	2	3	4	5	6									
y	2	3	5	6.5	7	8									
Option A:	$Y = 0.1 + 1.99x - 0.107x^2$														
Option B:	$Y = -2 + 1.99x - 0.107x^2$														
Option C:	$Y = -0.1 + 1.99x - 0.107x^2$														
Option D:	$Y = -0.1 + 1.99x + 0.107x^2$														
Q23.	Solve by using Laplace transform: $3y' + 2y = e^{3t}$ , $y=1$ at $t=0$ .														
Option A:	$Y = 10/11 e^{-(2/3)t} - 1/11 e^{3t}$														
Option B:	$Y = 10/11 e^{-(2/3)t} + 1/10 e^{3t}$														
Option C:	$Y = 30 e^{-(2/3)t} + 1/11 e^{3t}$														
Option D:	$Y = 10/11 e^{-(2/3)t} + 1/11 e^{3t}$														
Q24.	Find orthogonal trajectory: $X^2 - y^2 + x = C$														
Option A:	$2xy + y = c$														
Option B:	$2xy - y = c$														
Option C:	$xy + y = c$														
Option D:	$xy - y = c$														
Q25.	For two lines of regression $3x + 2y = 26$ , $6x + y = 31$ , find correlation coefficient between x and y.														
Option A:	$r = 0.96$														
Option B:	$r = -0.63$														
Option C:	$r = -0.5$														
Option D:	$r = 0.22$														