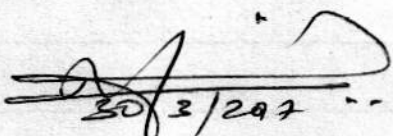

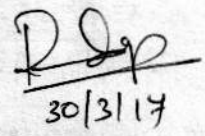
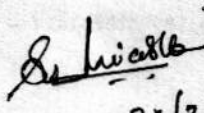
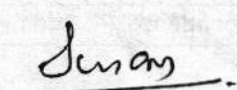
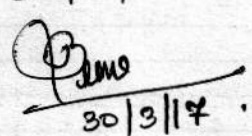
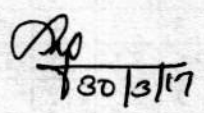
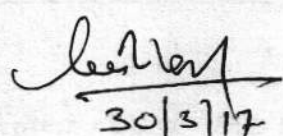
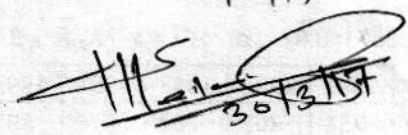
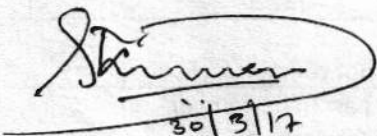
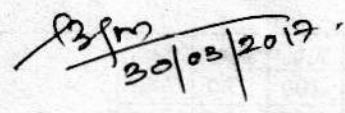


No	Scoring Indicators	Split Score	Total Score																																								
1(a)	(c)4	1	4																																								
1(b)	Required area = $\int_x f(x)dx = \int_2^4 (2x^2 + 1)dx$ Or identifying as an application of definite integral $= (2 \frac{x^3}{3} + x)_2^4$ $= \frac{112}{3} + 2 = \frac{118}{3} = 39.33 \text{sq.unit}$	1 1 1																																									
2	(b) Positive correlation	1																																									
3	<table border="1" style="margin-left: 20px;"> <tr> <td>Rank X</td> <td>1</td> <td>5</td> <td>7</td> <td>8</td> <td>3</td> <td>4</td> <td>2</td> <td>6</td> <td></td> </tr> <tr> <td>Rank Y</td> <td>2</td> <td>4</td> <td>8</td> <td>6</td> <td>3</td> <td>5</td> <td>1</td> <td>7</td> <td></td> </tr> <tr> <td>d=Rank X- Rank Y</td> <td>-1</td> <td>1</td> <td>-1</td> <td>2</td> <td>0</td> <td>-1</td> <td>1</td> <td>-1</td> <td></td> </tr> <tr> <td>d<sup>2</sup></td> <td>1</td> <td>1</td> <td>1</td> <td>4</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>10</td> </tr> </table> Rank correlation coefficient, $\rho = 1 - \left[ \frac{6 \sum d^2}{n(n^2-1)} \right]$ $= 1 - \left[ \frac{6 \times 10}{8(64-1)} \right] = 1 - \left[ \frac{60}{504} \right] = 1 - 0.119 = 0.881$ Correlation is high positive	Rank X	1	5	7	8	3	4	2	6		Rank Y	2	4	8	6	3	5	1	7		d=Rank X- Rank Y	-1	1	-1	2	0	-1	1	-1		d <sup>2</sup>	1	1	1	4	0	1	1	1	10	2 1 1	4
Rank X	1	5	7	8	3	4	2	6																																			
Rank Y	2	4	8	6	3	5	1	7																																			
d=Rank X- Rank Y	-1	1	-1	2	0	-1	1	-1																																			
d <sup>2</sup>	1	1	1	4	0	1	1	1	10																																		
4	Any option give one score ( translation error)	1	1																																								
5	Regression equation x on y is given by $(x - \bar{x}) = r \frac{\sigma_x}{\sigma_y} (y - \bar{y})$ (any form of regression equation of X on Y give 1 score) $(x - 50) = 0.7 \times \frac{5}{2} (y - 30)$ $(x - 50) = 1.75(y - 30)$ or $x = 1.75y - 2.5$	1 1 1	3																																								
6	(c) Discrete random variable	1	1																																								
7	Given n=10 and p=0.25 q = 1-p=0.75 $P(X = x) = nC_x p^x q^{n-x}; X = 0, 1, 2, 3, \dots, n$ $P(X = x) = 10C_x (0.25)^x (0.75)^{10-x}; X = 0, 1, 2, 3, \dots, 10$ Mean=np=2.5 Variance=npq=1.875	½ ½ 1 ½ ½	3																																								
<b>OR</b>																																											
8	<table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>15</td> </tr> <tr> <td>f</td> <td>25</td> <td>8</td> <td>5</td> <td>1</td> <td>1</td> <td>0</td> <td>40</td> </tr> <tr> <td>fx</td> <td>0</td> <td>8</td> <td>10</td> <td>3</td> <td>4</td> <td>0</td> <td>25</td> </tr> </table> $\lambda = \frac{\sum fx}{\sum f} = \frac{25}{40} = 0.625$ $P(x) = \frac{e^{-\lambda} \times \lambda^x}{x!}$ where $x = 0, 1, 2, \dots$ $P(3 \text{ defective}) = P(x=3) = \frac{e^{-0.625} \times (0.625)^3}{3!} = 0.02178$ Or Writing pdf of poisson distribution. ( 3 Score)	x	0	1	2	3	4	5	15	f	25	8	5	1	1	0	40	fx	0	8	10	3	4	0	25	1 1 1	3																
x	0	1	2	3	4	5	15																																				
f	25	8	5	1	1	0	40																																				
fx	0	8	10	3	4	0	25																																				
9	(d)0	1	1																																								
10	If f(x) is a pdf, we have $\int_0^2 f(x)dx = 1$ ie, $\int_0^2 (kx - 2)dx = 1$ ie, $(k \frac{x^2}{2} + 2x)_0^2 = 1$ $(2k+4)-(0+0) = 1$ $k = 2.5$	½ ½ 1 ½ ½	3																																								

No	Scoring Indicators	Split Score	Total Score																		
11	(a) Ten students are writing an exam and X is the number of students passing it or (b) X is the number of occurrences of brain cancer in a district per year	1	1																		
12	Any option give one score (representation of bracket is confusing)	.1	1																		
13	Given $\mu = 8$ and $\sigma = 3$ Let x represents life of television set $P(\text{television sets having life} < 6) = P(x < 6)$ $= P\left(\frac{x-\mu}{\sigma} < \frac{6-8}{3}\right)$ $= P(Z < -0.67)$ $= 0.5 - 0.2486 = 0.2514$  Expected number of television sets having life less than 6 = $10 \times 0.2514 = 2.514 \approx 3$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$	3																		
14	Any option give 1 score	1	1																		
15(a)	Any measurable function of population values is known as parameter. Any two examples ( $\frac{1}{2}$ score each)	1 1	2																		
15(b)	(a) Chi square distribution -- (1) mean equal to degrees of freedom (b) Normal distribution -- (3) symmetric about mean (c) F distribution -- (4) Used to test three or more means (d) Students 't' distribution -- (2) mean always zero or (3) symmetric about mean	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2																		
16	<table border="1" style="margin-left: 20px;"> <tr> <td>NO</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>Samples</td> <td>(2,3)</td> <td>(2,4)</td> <td>(3,4)</td> </tr> <tr> <td><math>\bar{x}</math></td> <td>2.5</td> <td>3</td> <td>3.5</td> </tr> </table> <p>Mean of sample means = <math>E(\bar{x}) = 9/3 = 3</math></p> <p>Population mean, <math>\mu = 9/3 = 3</math></p> <p>Since <math>E(\bar{x}) = \mu</math>, sample mean is an unbiased estimator of population mean</p>	NO	1	2	3	Samples	(2,3)	(2,4)	(3,4)	$\bar{x}$	2.5	3	3.5	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2						
NO	1	2	3																		
Samples	(2,3)	(2,4)	(3,4)																		
$\bar{x}$	2.5	3	3.5																		
17(a)	Sample mean	1	2																		
17(b)	Any option give one score	1																			
18	0.96	1	1																		
19	<p>We set up, <math>H_0</math>: Interest shown by students to the two subjects are independent. <math>H_1</math>: Interest shown by students to the two subjects are dependent.</p> <p>Expected Frequencies 55.44, 28.56, 10.56, 5.44</p> <table border="1" style="margin-left: 20px;"> <tr> <td>O</td> <td>56</td> <td>28</td> <td>10</td> <td>6</td> <td></td> </tr> <tr> <td>E</td> <td>55.44</td> <td>28.56</td> <td>10.56</td> <td>5.44</td> <td></td> </tr> <tr> <td><math>(O-E)^2/E</math></td> <td>0.01</td> <td>0.01</td> <td>0.03</td> <td>0.06</td> <td>0.11</td> </tr> </table> <p>Calculated value of chi square = 0.11</p> <p>Table value of Chi-square = <math>\chi^2_{[(2-1)(2-1), 0.05]} = \chi^2_{[1, 0.05]} = 3.84</math></p> <p>We accept <math>H_0</math>, since calculated value of chi square &lt; Table value of Chi-square. Or If second column total is taken as 37, Then Expected frequencies are 55.44, 31.08, 10.56, 5.92 Calculated value of chi square = 0.3416 We accept <math>H_0</math>, since calculated value of chi square &lt; Table value of Chi-square.</p>	O	56	28	10	6		E	55.44	28.56	10.56	5.44		$(O-E)^2/E$	0.01	0.01	0.03	0.06	0.11	$\frac{1}{2}$ 1 1 $\frac{1}{2}$ $\frac{1}{2}$	4
O	56	28	10	6																	
E	55.44	28.56	10.56	5.44																	
$(O-E)^2/E$	0.01	0.01	0.03	0.06	0.11																

No	Scoring Indicators	Split Score	Total Score																																																
<b>OR</b>																																																			
20	<p>We set up <math>H_0 : \mu = 4</math> against <math>H_1 : \mu \neq 4</math></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>2</td> <td>5</td> <td>4</td> <td>3</td> <td>4</td> <td>3</td> <td>3</td> <td>5</td> <td>3</td> <td>4</td> <td>36</td> </tr> <tr> <td><math>x^2</math></td> <td>4</td> <td>25</td> <td>16</td> <td>9</td> <td>16</td> <td>9</td> <td>9</td> <td>25</td> <td>9</td> <td>16</td> <td>138</td> </tr> </table> <p style="text-align: center;"><math>\bar{x} = \frac{36}{10} = 3.6,</math></p> <p style="text-align: center;"><math>s = \sqrt{\frac{138}{10} - (3.6)^2} = \sqrt{13.8 - 12.96} = \sqrt{0.84} = 0.92</math></p> <p style="text-align: center;">Since size small and <math>\sigma</math> unknown, test statistic <math>t = \frac{\bar{x} - \mu}{s/\sqrt{n-1}} = \frac{3.6 - 4}{0.92/\sqrt{10-1}} = -3.91</math></p> <p>Table value, <math>t_{(n-1, \alpha/2)} = 2.262</math>                      since <math> t  &gt;</math> table value of t, we reject <math>H_0</math>. Hence the belief is not correct</p>	x	2	5	4	3	4	3	3	5	3	4	36	$x^2$	4	25	16	9	16	9	9	25	9	16	138	<p>½</p> <p>½</p> <p>1</p> <p>½+½</p> <p>½</p> <p>½</p>	4																								
x	2	5	4	3	4	3	3	5	3	4	36																																								
$x^2$	4	25	16	9	16	9	9	25	9	16	138																																								
21	Any option give one score ( translation error)	1	1																																																
22(a)	(1) Normality (2) Homogeneity (3) Independence (4) Additivity (½ each)	2	4																																																
22(b)	Assignable causes -- Treatment variation Chance causes -- Random variation ANOVA -- Several means or Treatment variation or Random variation Test for variance -- Chi-square	½ ½ ½ ½																																																	
23	Any suitable definition.	1	1																																																
24	(b) Variability	1	1																																																
25	(d) Seasonal variation	1	1																																																
26	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>2</td> <td>3</td> <td>1</td> <td>5</td> <td>2</td> <td>4</td> <td>6</td> <td>1</td> <td>1</td> <td>2</td> <td></td> </tr> <tr> <td></td> <td>4</td> <td>2</td> <td>1</td> <td>4</td> <td>3</td> <td>3</td> <td>4</td> <td>2</td> <td>2</td> <td>2</td> <td></td> </tr> <tr> <td>mean</td> <td>3</td> <td>2.5</td> <td>1</td> <td>4.5</td> <td>2.5</td> <td>3.5</td> <td>5</td> <td>1.5</td> <td>1.5</td> <td>2</td> <td>27</td> </tr> <tr> <td>Range</td> <td>2</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> <td>0</td> <td>10</td> </tr> </table> <p><math>CL = \bar{x} = 27/10 = 2.7</math>  <math>\bar{R} = 10/10 = 1</math>  <math>UCL = \bar{x} + A_2 \bar{R} = 2.7 + 1.88 \times 1 = 4.58</math> or <math>UCL = \bar{x} + A_2 \bar{R} = 2.7 + 0.308 \times 1 = 3.008</math>  <math>LCL = \bar{x} - A_2 \bar{R} = 2.7 - 1.88 \times 1 = 0.82</math> or <math>LCL = \bar{x} - A_2 \bar{R} = 2.7 - 0.308 \times 1 = 2.392</math></p>		2	3	1	5	2	4	6	1	1	2			4	2	1	4	3	3	4	2	2	2		mean	3	2.5	1	4.5	2.5	3.5	5	1.5	1.5	2	27	Range	2	1	0	1	1	1	2	1	1	0	10	<p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p> <p>½</p>	3
	2	3	1	5	2	4	6	1	1	2																																									
	4	2	1	4	3	3	4	2	2	2																																									
mean	3	2.5	1	4.5	2.5	3.5	5	1.5	1.5	2	27																																								
Range	2	1	0	1	1	1	2	1	1	0	10																																								
27	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Year</td> <td>1990</td> <td>1991</td> <td>1992</td> <td>1993</td> <td>1994</td> <td>1995</td> <td>1996</td> <td>1997</td> <td>1998</td> </tr> <tr> <td>Sales</td> <td>170</td> <td>231</td> <td>261</td> <td>267</td> <td>678</td> <td>302</td> <td>299</td> <td>298</td> <td>340</td> </tr> <tr> <td>Semi average</td> <td colspan="4">232.3</td> <td colspan="5">309.8</td> </tr> </table> <p>Graph ( Using graph paper is not compulsory)</p>	Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	Sales	170	231	261	267	678	302	299	298	340	Semi average	232.3				309.8					<p>2</p> <p>2</p>	4																		
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998																																										
Sales	170	231	261	267	678	302	299	298	340																																										
Semi average	232.3				309.8																																														
28	(a) Understanding the past behaviour or (b) Predicting future behaviour or (c) Both (a) and (b)	1	1																																																
29	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>p_1</math></td> <td><math>p_0</math></td> <td><math>q_1</math></td> <td><math>q_0</math></td> <td><math>p_1 q_1</math></td> <td><math>p_1 q_0</math></td> <td><math>p_0 q_1</math></td> <td><math>p_0 q_0</math></td> </tr> <tr> <td>5</td> <td>2</td> <td>15</td> <td>20</td> <td>75</td> <td>100</td> <td>30</td> <td>40</td> </tr> <tr> <td>8</td> <td>4</td> <td>5</td> <td>4</td> <td>40</td> <td>32</td> <td>20</td> <td>16</td> </tr> <tr> <td>2</td> <td>1</td> <td>12</td> <td>10</td> <td>24</td> <td>20</td> <td>12</td> <td>10</td> </tr> <tr> <td>10</td> <td>5</td> <td>6</td> <td>5</td> <td>60</td> <td>50</td> <td>30</td> <td>25</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>199</td> <td>202</td> <td>92</td> <td>91</td> </tr> </table> <p style="text-align: center;">Fishers Index Number = <math>\sqrt{\frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100 \cdot \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100} = \sqrt{\frac{199}{92} \times 100 \times \frac{202}{91} \times 100}</math>  <math>= \sqrt{2.163 \times 100 \times 2.22 \times 100} = 100 \sqrt{4.80} = 219</math></p>	$p_1$	$p_0$	$q_1$	$q_0$	$p_1 q_1$	$p_1 q_0$	$p_0 q_1$	$p_0 q_0$	5	2	15	20	75	100	30	40	8	4	5	4	40	32	20	16	2	1	12	10	24	20	12	10	10	5	6	5	60	50	30	25					199	202	92	91	<p>2</p> <p>1</p> <p>1</p>	4
$p_1$	$p_0$	$q_1$	$q_0$	$p_1 q_1$	$p_1 q_0$	$p_0 q_1$	$p_0 q_0$																																												
5	2	15	20	75	100	30	40																																												
8	4	5	4	40	32	20	16																																												
2	1	12	10	24	20	12	10																																												
10	5	6	5	60	50	30	25																																												
				199	202	92	91																																												

1. MANOJ.K  30/3/2017 9447235515
2. LEKSHMI PAUITHRAN  30.03.17
3. Vidya Ramachandran  30/3/17
4. SR. JISHA VARGHESE  30/3/17
5. Susan David  30/3/17.
6. Beena Abraham  30/3/17.
7. Leena - P.V.  30/3/17
8. Mohamed Aslam.k.  30/3/17
9. Sakkeer.m  30/3/17
10. Sreejithkumar.m  30/3/17 9447380150
11. Bijm. G.V  30/03/2017 9447584301