

FIRST YEAR HIGHER SECONDARY EXAMINATION MARCH 2017

SUBJECT : STATISTICS

CODE. NO: 620

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
1.	a.	June 29 - (b)	1	3
	b.	Any 4 points $\frac{1}{2}$ each.	2	
2.		(a) 100	1	1
3.	a.	(b) 5 times the original value.	1	4
	b.	$\bar{x} = \frac{\sum wx}{\sum w} \quad \text{or} \quad \bar{x} = \frac{\sum fx}{\sum f}$ $= \frac{3 \times 82 + 5 \times 86 + 3 \times 90 + 2 \times 88}{13} = \underline{86.30769}$ $= \frac{1122}{13}$	$\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	
4.		$H.M = \frac{n}{\sum (\frac{1}{x})}$ $= \frac{4}{\frac{1}{100} + \frac{1}{200} + \frac{1}{300} + \frac{1}{400}}$ $= \frac{4}{\frac{1}{48}} = \underline{192} \text{ (approximately)}$ OR <u>A</u> $0.01 + 0.005 + 0.003 + 0.0025$ (Give 1 score for finding A.M)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	2
5.	a.	$\text{Mode} = 3\text{Median} - 2\text{Mean}$ $64.2 = 3 \times 68.6 - 2 \times \text{mean}$ $2\text{mean} = 141.6$ $\text{mean} = 70.8$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	(2)
	b.	$\text{mode} = l + \left[\frac{c(f_1 - f_0)}{2f_1 - f_0 - f_2} \right]$ modal class, 25 35, $l = 25$, $c = 10$, $f_0 = 13$, $f_1 = 22$, $f_2 = 18$.	$\frac{1}{2}$	

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		$= 25 + \frac{10(22-13)}{2 \times 22 - 13 - 18} = 25 + 6.923$ ≈ 31.923 (OR use mode = $l + \frac{cf_2}{f_1 + f_2} = 30.9$)	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ (3)	5
6.	a.	any answer give full score.	1	4
	b.	explanation or example	3	
7.	a.	d, indirect-oral interview.	1	1
8.		a $\rightarrow$ 4, b $\rightarrow$ 1, c $\rightarrow$ 2, d $\rightarrow$ 3	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$	2.
9.		Any 4 points - $\frac{1}{2}$ each	2	2
10		c - 6 ⁸	1	1
11	a.	$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $\frac{1}{2} = \frac{1}{4} + \frac{2}{5} - P(A \cap B)$ $P(A \cap B) = \frac{3}{20}$ $P(A \cap B^c) = P(A) - P(A \cap B) = \frac{1}{4} - \frac{3}{20} = \frac{1}{10}$ OR $P(A^c \cup B^c) = 1 - P(A \cap B) \quad (\frac{1}{2})$ $= 1 - \frac{3}{20} = \frac{17}{20} \cdot (\frac{1}{2})$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	2.
	b.	anyone (a or b) give full score 2		
12	a.	Total cases = 10, favourable cases = 6 $P = \frac{6}{10} = \frac{3}{5}$	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$	3
	b.	Favourable cases = $4C_2$ Total cases = $10C_2$ $P = \frac{4C_2}{10C_2}$	$\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	

OR $P = \frac{4}{10} \times \frac{3}{9}$

$\frac{2}{5}$

Qn No	Sub Qns	Answer Key/Value Points	Score	Total
13.	a.	OR $2/52, b = 8/52, c = \frac{48}{52}$	1+1+1	3
14.		Proper explanation		2
15.	a.	Frequency polygon	1	4
	b.	Proper class formation 2.5-7.5 2.5-7.5, 7.5-12.5, 12.5-17.5, 17.5-22.5 2 4 3 7 22.5-27.5 27.5-32.5 32.5-37.5 6 3 1	1	
		give 2 score for correct frequency	2	
16.	a.	$P(A B) = \frac{P(A \cap B)}{P(B)} = \frac{2}{5} = 0.4$ OR $A = \{(1,5), (5,1), (2,4), (4,2), (3,3)\}$ favourable cases (4,2), (2,4) $\therefore P = 2/5$	2.	4
	b.	entry level give full score.	2	
17.		B_1 - selecting packet $\underline{I}$ B_2 - " $\underline{II}$ $P(B_1) = 1/2, P(B_2) = 1/2, P(A B_1) = 2/10$ $P(A B_2) = 1/12$ $P(B_1 A) = \frac{P(B_1) \times P(A B_1)}{P(B_1) \times P(A B_1) + P(B_2) \times P(A B_2)}$ $= \frac{1/10}{(1/10 + 1/24)} = \frac{12}{17} = 0.7059$	$1/2$ $1/2$ $1/2 + 1/2$ 1 $1/2 + 1/2$	4

Qn No	Sub Qns	Answer Key/Value Points	Score	Total																																																																
18.		quantitative	1	1																																																																
19.		<table><thead><tr><th>class</th><th>fre.</th><th>UL</th><th>LCF</th><th>LL</th><th>GCF</th><th>RF</th><th>%F</th></tr></thead><tbody><tr><td>0-10</td><td>5</td><td>10</td><td>5</td><td>0</td><td>55</td><td>5/55</td><td>9</td></tr><tr><td>10-20</td><td>7</td><td>20</td><td>12</td><td>10</td><td>50</td><td>7/55</td><td>13</td></tr><tr><td>20-30</td><td>17</td><td>30</td><td>29</td><td>20</td><td>43</td><td>17/55</td><td>31</td></tr><tr><td>30-40</td><td>12</td><td>40</td><td>41</td><td>30</td><td>26</td><td>12/55</td><td>22</td></tr><tr><td>40-50</td><td>5</td><td>50</td><td>46</td><td>40</td><td>14</td><td>5/55</td><td>9</td></tr><tr><td>50-60</td><td>2</td><td>60</td><td>48</td><td>50</td><td>9</td><td>2/55</td><td>3</td></tr><tr><td>60-70</td><td>7</td><td>70</td><td>55</td><td>60</td><td>7</td><td>7/55</td><td>13</td></tr></tbody></table> For any two correct tables give full score.	class	fre.	UL	LCF	LL	GCF	RF	%F	0-10	5	10	5	0	55	5/55	9	10-20	7	20	12	10	50	7/55	13	20-30	17	30	29	20	43	17/55	31	30-40	12	40	41	30	26	12/55	22	40-50	5	50	46	40	14	5/55	9	50-60	2	60	48	50	9	2/55	3	60-70	7	70	55	60	7	7/55	13		4
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20	a	15	1																																																																	
	b.	$\bar{x} = \frac{18.2}{7} = 2.6$ $M.D = \frac{\sum x - \bar{x} }{n}$ $= \frac{1}{7} [0.3 + 0.8 + 0.6 + 0.1 + 0.1 + 0.4 + 0.1]$ $= 2.4/7 = 0.341$	1 1 1/2 1 1/2	4																																																																
21.		b An average of Square of deviations from the mean	1	1																																																																
22.		<table><thead><tr><th>x</th><th>x²</th><th>y</th><th>y²</th></tr></thead><tbody><tr><td>55</td><td>3025</td><td>108</td><td>11664</td></tr><tr><td>54</td><td>2916</td><td>107</td><td>11449</td></tr><tr><td>52</td><td>2704</td><td>105</td><td>11025</td></tr><tr><td>53</td><td>2809</td><td>105</td><td>11025</td></tr><tr><td>56</td><td>3136</td><td>106</td><td>11236</td></tr><tr><td>58</td><td>3364</td><td>107</td><td>11449</td></tr><tr><td>52</td><td>2704</td><td>104</td><td>10816</td></tr><tr><td>50</td><td>2500</td><td>103</td><td>10609</td></tr><tr><td>51</td><td>2601</td><td>104</td><td>10816</td></tr><tr><td>49</td><td>2401</td><td>101</td><td>10201</td></tr><tr><td>530</td><td>28160</td><td>1050</td><td>110250</td></tr></tbody></table> $\bar{x} = 53 \quad \bar{y} = 105$ $\sigma_x = \sqrt{\frac{\sum x^2}{n} - (\bar{x})^2}$ $= \sqrt{7} = 2.646$ $\sigma_y = \sqrt{\frac{\sum y^2}{n} - (\bar{y})^2}$ $= \sqrt{4} = 2$ $C.V \text{ of } x = \frac{\sigma_x}{\bar{x}} \times 100$ $= \frac{2.646}{53} \times 100 = 4.99\%$ $C.V \text{ of } y = \frac{\sigma_y}{\bar{y}} \times 100$ $= \frac{2}{105} \times 100 = 1.90\%$ y is more consistent	x	x ²	y	y ²	55	3025	108	11664	54	2916	107	11449	52	2704	105	11025	53	2809	105	11025	56	3136	106	11236	58	3364	107	11449	52	2704	104	10816	50	2500	103	10609	51	2601	104	10816	49	2401	101	10201	530	28160	1050	110250	Table-2 1 1/2 1/2 1/2 1/2	5																
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Qm. No. Sub. Que.

Answer key / value Points

Score Total

23.

x	f	fx	fx^2
100	19	1900	190000
110	23	2530	278300
120	36	4320	518400
130	70	9100	1183000
140	52	7280	1019200
	200	25130	3188900

$$\bar{x} = \frac{\sum fx}{N} = \frac{25130}{200} = \underline{\underline{125.65}}$$

$$\sigma = \sqrt{\frac{\sum fx^2}{N} - \bar{x}^2}$$

$$= \underline{\underline{12.513}}$$

2

1

5

2

24. a. $i \rightarrow Q_1 + Q_3 = 2Q_2$.

1

b. Finding skewness or kurtosis by raw data or any other proper attempt

4

5

5/5