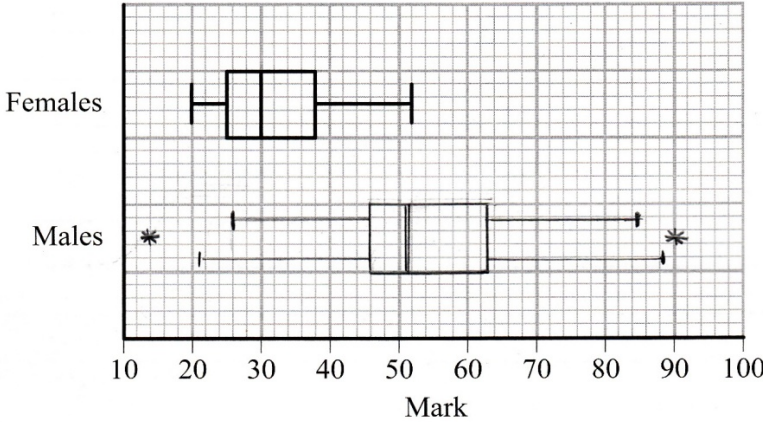
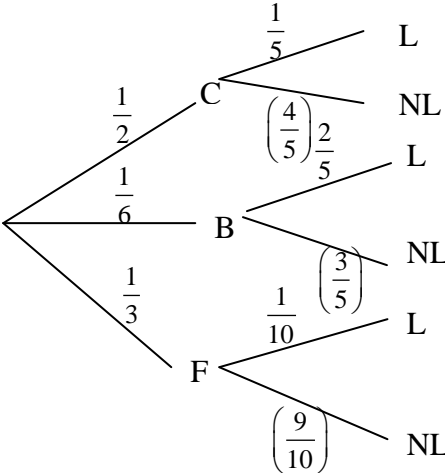


**Edexcel GCE**  
**Statistics S1**  
**Silver Level S1**  
**(Mark Scheme)**

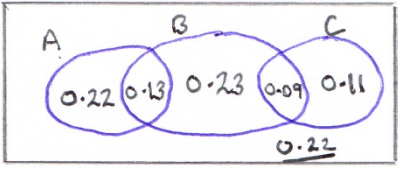
**All exam papers are issued free to students for education purpose only.  
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Question Number	Scheme	Marks
<p>1. (a)</p>	<p><math>\Sigma x = 773, \Sigma y = 724</math></p> $r = \frac{10 \times 56076 - 773 \times 724}{\sqrt{(10 \times 60475 - 773^2)(10 \times 53122 - 724^2)}} \quad \text{o.e.}$ <p><math>r = 0.155357 \dots</math></p> <p>(b) Both weak correlation</p> <p>Neither score is a good indication of future performance</p> <p>Interview test is slightly better since correlation is positive</p>	<p>B1, B1</p> <p>M1 A1ft</p> <p>A1</p> <p>(5)</p> <p>B1g B1h</p> <p>(2)</p> <p>[7]</p>
<p>2. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>25 (allow any <math>x</math> where <math>24 &lt; x &lt; 26</math>)</p> <p><b>Q<sub>2</sub></b> ( or median or <math>m</math> ) = <b>51</b></p> <p><b>IQR</b> = <math>63 - 46</math> , = <b>17</b> (or <math>Q_3 - Q_1 = 17</math>)</p> <p>Outliers given by <math>46 - 1.5 \times 17 = 20.5</math> <u>or</u> <math>63 + 1.5 \times 17 = 88.5</math></p> <p>Outliers limits are <b>20.5</b> <u>and</u> <b>88.5</b></p>  <p>Allow lower whisker to 20.5 and upper whisker to 88.5</p> <p>Do <b>not</b> allow a mix of whiskers e.g 20.5 and 85</p> <p>Do <b>not</b> allow both sets of whiskers</p> <p><b>Medians:</b> Median for females lower than males</p> <p><b>IQR:</b> IQR for females smaller than males. Allow “lower/higher” but not “wider”</p> <p><b>Range:</b> Range of females is less than males</p> <p><b>Skewness:</b> Male and female marks are both positively skew</p>	<p>B1</p> <p>(1)</p> <p>B1</p> <p>M1, A1</p> <p>(3)</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1ft</p> <p>B1</p> <p>(5)</p> <p>B1ft</p> <p>B1ft</p> <p>(2)</p> <p>[11]</p>

Question Number	Scheme	Marks
3. (a)	 <p style="text-align: right; margin-right: 100px;">Correct tree All labels Probabilities on correct branches</p>	<p style="text-align: right;">B1 B1 B1</p>
		(3)
(b)(i)	$\frac{1}{3} \times \frac{1}{10} = \frac{1}{30}$ or equivalent	M1 A1
		(2)
(ii)	$\frac{1}{3} \times \frac{1}{10} = \frac{1}{30}$ or equivalent	M1
	$CNL + BNL + FNL = \frac{1}{2} \times \frac{4}{5} + \frac{1}{6} \times \frac{3}{5} + \frac{1}{3} \times \frac{9}{10}$	A1
		(2)
(c)	$P(F'/L) = \frac{P(F' \cap L)}{P(L)}$ Attempt correct conditional probability	M1
	$= \frac{\frac{1}{6} \times \frac{2}{5} + \frac{1}{2} \times \frac{1}{5}}{1 - (ii)}$	$\frac{\text{numerator}}{\text{denominator}}$ A1 A1ft
	$= \frac{5}{30} = \frac{5}{6}$ or equivalent	cao
		A1
		(4)
		<b>[11]</b>

Question Number	Scheme	Marks
<p>4. (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p> <p>(e)</p>	<p>60</p> <p><math>Q_1 = 46</math> <math>Q_2 = 56</math> <math>Q_3 = 64</math></p> <p>mean = 55.48... or <math>\frac{2497}{45}</math> awrt 55.5</p> <p>sd = <math>\sqrt{\frac{143369}{45} - \left(\frac{2497}{45}\right)^2}</math> = 10.342... (s = 10.459..)</p> <p>Mean &lt; median &lt; mode or <math>Q_2 - Q_1 &gt; Q_3 - Q_2</math> with or without their numbers or median closer to upper quartile (than lower quartile) or (mean-median)/sd &lt; 0; negative skew;</p> <p>mean = <math>(55 - 5) \times 0.9</math> = 45 sd = <math>10 \times 0.9</math> = 9</p>	<p>B1 (1)</p> <p>B1 B1 B1 (3)</p> <p>B1 M1 A1 (3)</p> <p>B1 B1dep (2)</p> <p>M1 A1 M1 A1 (4)</p> <p><b>[13]</b></p>
<p>5. (a)</p> <p>(b)</p> <p>(c)</p>	<p>Median = <math>32/2 = 16</math>th term (16.5)</p> <p><math>\frac{x - 39.5}{49.5 - 39.5} = \frac{16 - 14}{25 - 14}</math> or <math>x = 39.5 + \left(\frac{2}{11} \times 10\right)</math></p> <p>Median = 41.3 (use of <math>n + 1</math> gives 41.8) (awrt 41.3)</p> <p>Mean = <math>\frac{1414}{32} = 44.1875</math> (awrt 44.2)</p> <p>Standard deviation = <math>\sqrt{\frac{69378}{32} - \left(\frac{1414}{32}\right)^2}</math> = 14.7 (or s = 14.9)</p> <p>mean &gt; median therefore positive skew</p>	<p>M1 A1 (2)</p> <p>B1</p> <p>M1 A1 (3)</p> <p>B1ft B1ft (2)</p> <p><b>[7]</b></p>

Question Number	Scheme	Marks
6. (a)	See overlay	B1 B1 (2)
(b)	The <b>points</b> lie reasonably close to a straight <b>line</b> (o.e.)	B1 (1)
(c)	$\sum d = 27.7, \quad \sum f = 146$ (both, may be implied) $S_{dd} = 152.09 - \frac{(27.7)^2}{6} = 24.208\dots$ awrt <u>24.2</u> $S_{fd} = 723.1 - \frac{27.7 \times 146}{6} = 49.06\dots$ awrt <u>49.1</u>	B1 M1 A1 A1 (4)
(d)	$b = \frac{S_{fd}}{S_{dd}} = 2.026\dots$ awrt <u>2.03</u> $a = \frac{146}{6} - b \times \frac{27.7}{6} = 14.97\dots$ so <u><math>f = 15.0 + 2.03d</math></u>	M1 A1 M1 A1 (4)
(e)	A flight costs <b>£2.03 (or about £2)</b> for every extra <b>100km</b> or about <b>2p</b> per <b>km</b> .	B1ft (1)
(f)	$15.0 + 2.03d < 5d$ so $d > \frac{15.0}{(5 - 2.03)} = 5.00 \sim 5.05$ So $t > 500 \sim 505$	M1 A1 (2) <b>[14]</b>

Question Number	Scheme	Marks
7. (a)	$P(A \cup B) = 0.35 + 0.45 - 0.13 \quad \text{or} \quad 0.22 + 0.13 + 0.32$ $= \underline{\mathbf{0.67}}$	M1 A1 (2)
7. (b)	$P(A'   B') = \frac{P(A' \cap B')}{P(B')} \quad \text{or} \quad \frac{0.33}{0.55}$ $= \frac{3}{5} \quad \text{or} \quad 0.6$	M1 A1 (2)
7. (c)	$P(B \cap C) = 0.45 \times 0.2$ $= \underline{\mathbf{0.09}}$	M1 A1 (2)
7. (d)	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">  </div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> <p>Allow 1<sup>st</sup> B1 for 3 intersecting circles in a box with zeros in the regions for <math>A \cap C</math> Do not accept "blank" for zero</p> </div> </div>	B1 B1ft B1 B1 (4)
7. (e)	$P(B \cup C)' = 0.22 + \underline{\mathbf{0.22}} \quad \text{or} \quad 1 - [0.56] \quad \text{or} \quad 1 - [0.13 + 0.23 + 0.09 + 0.11]$ $= \underline{\mathbf{0.44}} \quad \text{o.e.}$	M1 A1 (2) <b>[12]</b>

## Statistics for S1 Practice Paper Silver Level S1

Qu	Max Score	Modal score	Mean %	Mean score for students achieving grade:							
				ALL	A*	A	B	C	D	E	U
1	7		79	5.53		5.99	5.57	5.24	4.83	4.38	3.29
2	11	10	74	8.10	10.09	9.85	9.06	8.38	7.69	7.00	5.27
3	11		73	8.03		9.89	8.68	7.87	7.13	6.50	5.15
4	13		70	9.12	11.49	10.65	9.31	8.54	7.74	7.09	5.22
5	7		66	4.60	6.35	5.89	4.93	4.21	3.35	2.64	1.66
6	14		62	8.65	11.47	10.33	9.25	8.64	8.13	7.48	5.58
7	12	12	66	7.96	11.35	10.49	8.65	6.80	5.37	4.52	3.36
	<b>75</b>		<b>69</b>	<b>51.99</b>		<b>63.09</b>	<b>55.45</b>	<b>49.68</b>	<b>44.24</b>	<b>39.61</b>	<b>29.53</b>