Revision Test 20.6 Answers

1. (a) (i) There could be outliers that distort the range. B1

(ii) This could be influenced unduly by extreme data. B1

(b) $30 + 10 \times \frac{14}{16}$ M2 A1

$= 38.75$ A1

(c) (1) No effect (ii) No effect B1 B1

(iii) Increases range (iv) No effect B1 B1 *(10 marks)*

2. (a)

Time	18–	23–	26–	29–	32–	37–		
Frequency	18	25	27	19	8	3		
Class width	5	3	3	3	5	5		B1
Rel. frequ.	3.6	8.33	9	6.33	1.6	0.6	(one error B1)	B2

Histogram axes B1

correct heights and widths B2

(b) 26.3 B2

(c) As the new data is not symmetric, the median might be a better 'average' to use. B1 *(9 marks)*

3. (a) The pyramid has significant numbers in the 60+ ages (e.g. 60-70) B1

(b) $300 + 275 = 575$ M1 A1

(c) $400 \times \frac{(275 + 175 + 100)}{4000}$ M1 A1

$= 55$ A1 *(6 marks)*

4. (a) 11, 27, 56, 87, 108, 120 (one error B1) B2

(b) graph (one error B1) B2

(c) (i) 32 (ii) $41 - 22 = 19$ B1 M1 A1 A1

(d) In general, the marks in Maths are much more spread out. B1 *(9 marks)*

5. (a) (i) 51 (ii) 2.07 M1 A1 M2 M1

(b) The first machine is preferred, since, although the means are the same, the s.d. and hence variability is much lower. B2 *(7 marks)*

6. (a) Town A : total population $= 25000$ B1

no. of deaths $= 6.12 \times 25 = 153$ B1

$x = 153 - 131 = 22$ B1

(b) $(1 \times 0.2) + (2 \times 0.25) + (4 \times 0.30) + (4 \times 0.15) + (17 \times 0.1)$ M1 A1

$= 4.2$ A1

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(c) A : $\left(\frac{10}{3}\times 0.15\right)+\left(\frac{16}{5.5}\times 0.25\right)+\left(\frac{22}{5}\times 0.25\right)+\left(\frac{35}{5.5}\times 0.20\right)+\left(\frac{70}{6}\times 0.15\right)$ M1 A1

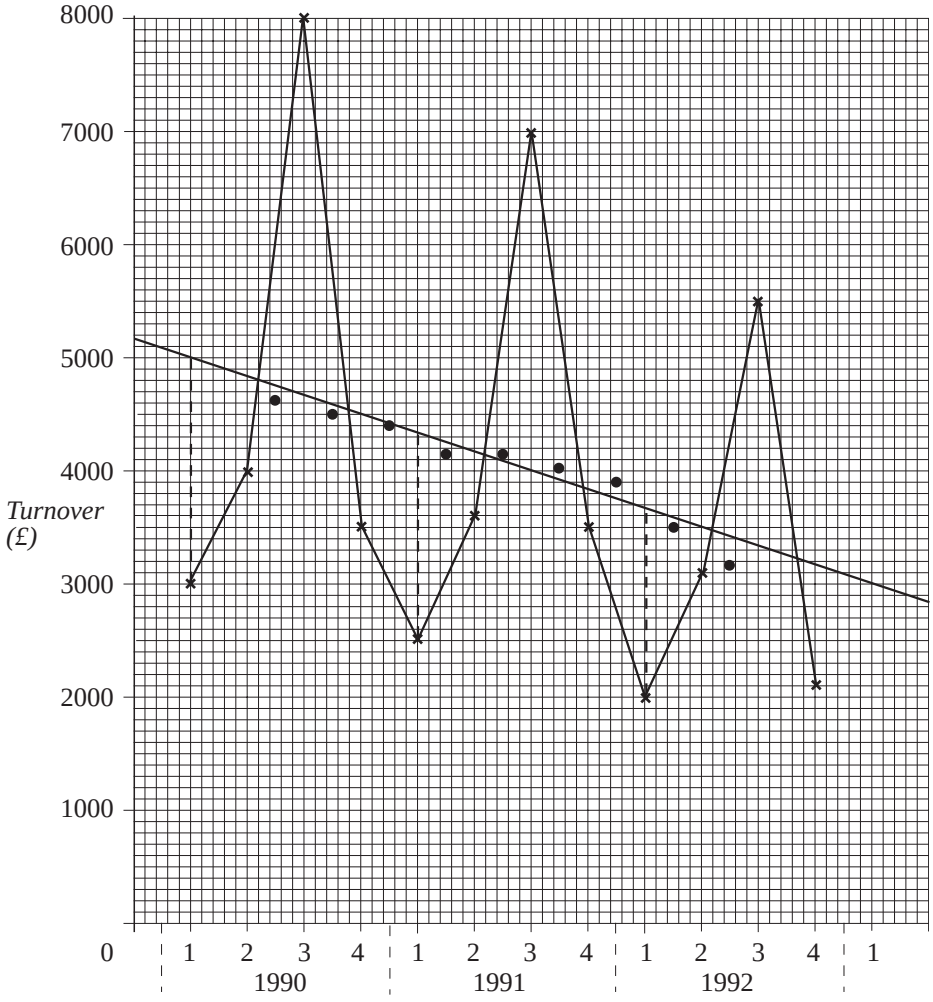
$= 5.35$ A1

B : $(1\times 0.15)+(2\times 0.25)+(4\times 0.25)+(4\times 0.20)+(17\times 0.15)$ M1 A1

$= 5$ A1

(d) B, since its standardised death rate is slightly less than A's. B2 *(14 marks)*

7.



(a) Plotting value axes B1

(–1 for each error) plots B3

(b) (i) 4.625, 4.5, 4.4, 4.15, 4.15, 4.025, 3.9, 3.525, 3.175

4 point B1

(–1 for each error) values B2

(ii) Plotting points (–1 for each error) B2

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(c) Trend line B1

Estimate $= 3000 - \frac{1}{3}(1900 + 1800 + 1700) = 1200$ M1 A1 *(12 marks)*

8. (a) $\frac{703}{646} \times 100$ M1 A1

≈ 109 A1

(b) $\frac{295}{306} \times 100$ M1

≈ 96 A1

(c) Totals : 2003, 2270 B1 B1

Index : $\frac{2270}{2003} \times 100$ M1 A1

≈ 113 A1 *(10 marks)*

9. (a) (i) Strongly positive correlation B1

(ii) Heating costs increase in proportion to floor area B1

(b) -1 B1

(c) (i)

DB	3	4	6	2	1	5	
BB	1	3	5	4	2	6	
$\lvert d \rvert$	2	1	1	2	1	1	
d^2	4	1	1	4	1	1	$\sum d^2 = 12$

B1 B1

B1

(ii) $r = 1 - \frac{6 \times 12}{6 \times 35} \approx 0.66$ M1 A1

(iii) There is some correlation. B1 *(9 marks)*

10. (a) Andrew got 1.5 s.d.s above the mean for both subjects. B1

Barbara got 0.5 s.d.s below mean for Maths, B1

and 2.5 s.d.s above the mean for Music. B1

(b) There is a very strong correlation between marks for Maths and Music. B2 *(5 marks)*

11. (a) $\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} = \frac{1}{216}$ M1 A1

(b) $648 \times \frac{1}{216} = 3$ M1 A1 *(4 marks)*

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12.	(a)	10	B1	
	(b)	$\frac{3}{4}$	B1	
	(c)	11	B1	
	(d)	$\frac{10}{11}$	B1	
	(e)	There are 39 people with brown eyes and not blond hair.	B1	*(5 marks)*
			TOTAL	**100 marks**