Student Name: Solutions

Date: _____2016

Special Instructions: No Calculators

Time Allowed: 30 mins

Marks: / 16

For each of the following tables of time series data:

Complete the table by calculating the moving average, with centring to smooth the data, if required, and rounded to one decimal place where appropriate.

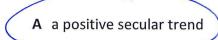**Question 1** (5 marks)

Unemployment in the town of Bargon, 2012

Month	No. of unemployed	Three-point moving average
January	678	✓ blank
February	645	$\frac{678+645+672}{3}$ ✓ 665
March	672	652.7
April	641	647
May	628	635.7
June	638	627 ✓ all values correct
July	615	623.7
August	618	608.7
September	593	597.3
October	581	591
November	599	584.3
December	573	✓ blank

Question 2 (8 marks)

Number of houses sold each year by a real-estate business

Year	No. of houses sold	Four-point moving average	Four-point moving average with centring
2000	28		✓ blank
2001	35		
		$\dfrac{28+35+41+21}{4}$ ✓ = 31.3	
2002	41		$\dfrac{31.3+31.5}{2}$ ✓ = 31.4
		31.5	
2003	21		29.8
		28	
2004	29		24.9
		21.8	
2005	21		23.2
		24.5	
2006	16		22.3 ✓ all correct values
		20	
2007	32		19.8
		19.5 ✓ all values correct	
2008	11		19.3
		19	
2009	19		18.7
		18.3	
2010	14		19.6
		20.8	
2011	29		22.6
		24.3	
2012	21		✓ blank
2013	33		

Question 3 (1 mark)

A time series for the weight of a baby is most likely to have:

A a positive secular trend   **D** a seasonal variation

B a negative secular trend   **E** a random variation

C a cyclic pattern

Question 4 (1 mark)

If a three-point moving average is used to smooth the data in the table below, calculate the smoothed value for the year 2010. If necessary, round to the nearest whole number of births.

Year	2008	2009	2010	2011	2012	2013
Births	261	264	278	308	320	324

A 276   **D** 283

B 278   **E** 286

C 280

Question 5 (1 mark)

If a four-point moving average is used to smooth the data in the table below, calculate the smoothed value for the year 2002. If necessary, round to the nearest whole number of births.

Year	2000	2001	2002	2003	2004	2005	2006	2007
Births	185	190	208	236	264	275	304	340

264.75   224.5

A 208   **D** 217

B 211   **E** 250

C 215