

|  |  |  |
| --- | --- | --- |
| **MATHEMATICS DEPARTMENT** | |  |
| **Course:** **ATMAA** | |
| **Topic Title**: **Skills Test 7** | |
| Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 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 |  |
| February | 645 |  |
| March | 672 |  |
| April | 641 |  |
| May | 628 |  |
| June | 638 |  |
| July | 615 |  |
| August | 618 |  |
| September | 593 |  |
| October | 581 |  |
| November | 599 |  |
| December | 573 |  |

**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 |  |  |
| 2001 | 35 |  |  |
|  |  |  |  |
| 2002 | 41 |  |  |
|  |  |  |  |
| 2003 | 21 |  |  |
|  |  |  |  |
| 2004 | 29 |  |  |
|  |  |  |  |
| 2005 | 21 |  |  |
|  |  |  |  |
| 2006 | 16 |  |  |
|  |  |  |  |
| 2007 | 32 |  |  |
|  |  |  |  |
| 2008 | 11 |  |  |
|  |  |  |  |
| 2009 | 19 |  |  |
|  |  |  |  |
| 2010 | 14 |  |  |
|  |  |  |  |
| 2011 | 29 |  |  |
|  |  |  |  |
| 2012 | 21 |  |  |
| 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 |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 208 | **D** | 217 |
| **B** | 211 | **E** | 250 |
| **C** | 215 |  |  |