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| AIC, MATHEMATICS LEARNING AREA**YEAR 11 MATHEMATICS APPLICATIONS – UNIT 1****Assessment type: Response****TASK 3 – TEST 2****Non – Calculator section 1** |

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID: \_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_

**TIME ALLOWED FOR THIS PAPER**

**Reading and Working time for this paper: 45 minutes in class under test conditions**

**MATERIAL REQUIRED FOR THIS PAPER**

*TO BE PROVIDED BY THE SUPERVISOR*

Question/answer booklet for sections one and two.

*TO BE PROVIDED BY THE CANDIDATE*

*Standard Items:* pens, pencils, pencil sharpener, highlighter, eraser, ruler, drawing templates

**IMPORTANT NOTE TO CANDIDATES**

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

**Structure of this paper**

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Number of questions available | Suggested working time (minutes) | Marks available |
| **1- Non-calculator** | **3** | **15** | **15** |
| **2- Calculator assumed** | **5** | **30** | **30** |
|  | **Marks available:** | 45 |
| **Task Weighting** | 7%  |

**Instructions to candidates**

* The rules for the conduct of this examination are detailed in the booklet *WACE* *Examinations Handbook*. Sitting this examination implies that you agree to abide by these rules.
* Answer the questions in the spaces provided.
* Spare answer pages can be used. If you need to use them, indicate in the original answer space where the answer is continued.

### SCSA Content – Topic 1.1: Consumer Arithmetic

### Applications of rates and percentages and use of spread sheets

* + 1. calculate weekly or monthly wage from an annual salary, wages from an hourly rate, including situations involving overtime and other allowances, and earnings based on commission or piecework
		2. calculate payments based on government allowances and pensions
		3. prepare a personal budget for a given income taking into account fixed and discretionary spending
		4. compare prices and values using the unit cost method
		5. use currency exchange rates to determine the cost in Australian dollars of purchasing a given amount of a foreign currency, or the value of a given amount of foreign currency, when converted to Australian dollars
		6. calculate the dividend paid on a portfolio of shares given the percentage dividend or dividend paid for each share, and compare share values by calculating a price-to-earnings ratio
		7. use a spreadsheet to display examples of the above computations when multiple or repeated computations are required; for example, preparing a wage-sheet displaying the weekly earnings of workers in a fast food store where hours of employment and hourly rates of pay may differ, preparing a budget, or investigating the potential cost of owning and operating a car over a year

### SCSA Content – Topic 1.2: Algebra and Matrices

**Matrices and matrix arithmetic**

1. Use matrices for storing and displaying information that can be presented in rows and columns, for example, databases, links in social or road networks. Recognises different types of matrices (row, column, square, zero, identity) and determine their size.
2. Perform matrix addition, subtraction, multiplication by a scalar, and matrix multiplication, including determining the power of a matrix using technology with matrix arithmetic capabilities when appropriate.
3. Use matrices, including matrix products and powers of matrices, to model and solve problems; for example, costing or pricing problems, squaring a matrix to determine the number of ways pairs of people in a communication network can communicate with each other via a third person.

**Question 1 [6 marks]**

Given the following matrices answer the questions below:

$A=\left[\begin{matrix}1&y&2\end{matrix}\right]$ $B=\left[\begin{matrix}4\\2\\ 0 \end{matrix}\right]$ $C=\left[ \begin{matrix}1&0\\0&1\end{matrix} \right]$

(a) What is the name given to matrix A? (1 marks)

(b) What is the name given to matrix C? (1 marks)

(c) Find matrix D, if matrix $D=4A × \frac{1}{\sqrt{4}} B$ (2 marks)

(d) What is the value of y if matrix D was given as $D=\left[ 8 \right]$? (2 marks)

**Question 2 [4 marks]**

The following table shows the amount 1 Australian dollar will buy for a number of foreign currencies.

|  |  |
| --- | --- |
|  | $1 Australian dollar will buy |
| Euro € | 0.70 Euros |
| Canadian dollars C$ | 1.1 Canadian dollars |

(a) A tourist wishes to visit Europe and Canada for the holidays. He has AU$7000 and wishes to convert AU$5000 to Euros € and AU$2000 to Canadian dollars C$. How much of each currency will he have? (2 marks)

(b) After the trip the tourist returns to Australia with 140€ and C$220. How many Australian dollars can he convert back to? (2 marks)

**Question 3 [5 marks]**

An accountant wishes to calculate the pay slip for the following employee:



|  |  |
| --- | --- |
| Day | Hours worked |
| Monday | 10 |
| Tuesday | 5 |
| Wednesday | 5 |
| Thursday | 12 |
| Friday | 4 |
| Saturday | 4 |
| Sunday | 5 |

The employees contract states that:

- The first 8 hours worked on a weekday is paid at normal hourly rate

- Any hours worked on a weekday after the 8 hours will be paid at the time and half rate for the first 2 hours and the double pay rate after that

- Any hours worked on Saturday will be paid at the time and a half rate

- Any hours worked on Sundays or public holidays will be paid at the double pay rate

If the employee’s standard pay rate is $20/hr calculate the weekly wage for this employee.

**EXTRA WORKING PAGE:**