**Section: A**

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| **Q1:** | a)   Evaluate 3 + 8 ÷ (4 – 2)      b)    Determine the value of *k* in the following equation:  *k* + 5 = 23 – 2*k*  *k* =    c)    Given that *x* is a variable, determine the value of *m* in the following equation:  *x*3*m* = *x*6  *m* = | **Mark (3)** |

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**Section: B**

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| **Q2:** | a)    Determine the value of *n*(*A*) for set *A* = {*x* : *x* is an integer divisible by 3 and 1 ≤ *x* ≤ 15}.  *n*(*A*)=      b)    Given that *ε* = {*x* : *x* is an integer and 4 < *x* < 10} and set *P* = {7, 8}, which **option** in Table B1 represents *P*′?  Table B1   |  |  | | --- | --- | | **Option** | **Answer** | | A | *P*′ = {4, 5, 6, 7, 8, 9, 10} | | B | *P*′ = {4, 5, 6, 9, 10} | | C | *P*′ = {5, 6, 7, 8, 9} | | D | *P*′ = {5, 6, 9} |     Option =      c)    A Truth table is given below in Table B2. Determine the truth value of *x*.  Table B2   |  |  |  | | --- | --- | --- | | *Q* | *R* | *Q*′ ∪ *R*′ | | F | F | *x* | | F | T | T | | T | F | *y* | | T | T | F |     *x* = | **Mark (3)** |

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**Section: C**

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| **Q3:** | a)    Convert 11012 to its decimal form.      b)    Convert 758 to its binary number form. Which **option** in Table C1 corresponds to the correct answer?  Table C1   |  |  | | --- | --- | | **Option** | **Answer** | | A | 1011112 | | B | 1111012 | | C | 10010112 | | D | 11101012 |     Option =        c)    Convert 51 to its base 6 number form. Which **option** in Table C2 corresponds to the correct answer?  Table C2   |  |  | | --- | --- | | **Option** | **Answer** | | A | 236 | | B | 316 | | C | 1236 | | D | 3216 |     Option = | **Mark (3)** |

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**Section: D**

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| **Q4:** | a)    Determine the gradient of the straight line that passes through points (6, 1) and (11, 3).  Gradient =    b)    Given that three points (12, *k*), (3, 8) and (4, 14) are collinear, find the value of *k*.  *k* =    c)    The equation of line AB is *y* = 6*x* + 7. Line AB is perpendicular to line CD. Determine the gradient of line CD.  Gradient = | **Mark (3)** |

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**Section: E**

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| **Q5:** | Figure E1 shows the graph of the equation: *y* = 2*x*2 – 13*x* + 15.  The graph intersects the *x*-axis at points (*a,* 0) and (*b,* 0). The graph intersects the *y*-axis at point (0, *c*). The graph has a line of symmetry that passes through (*d, e*).  *C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1438305997_1404519210.jpeg*    a) Determine the value of *a*.  *a* =    b) Determine the value of *c*.  *c*=    c) Determine the value of *d*.  *d*= | **Mark (3)** |

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**Section: F**

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| **Q6:** | The cost of four purchases involving four types of beverages from a cafe are summarised in Table F1 as shown below. It is known that the price for each type of drink is the same in each purchase.  Table F1   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Espresso** | **Latte** | **Cappuccino** | **Mocha** | **Total Price ($)** | | 4 | 4 | 2 | 2 | **43.40** | | 0 | 5 | 5 | 4 | **54.00** | | 7 | 6 | 3 | 2 | **64.30** | | 0 | 8 | 8 | 4 | **76.80** |     a)    By observing the rows, what is the total cost of purchasing 2 cups of espresso, 2 cups of latte, 1 cup of cappuccino and 1 cup of mocha?  $    b)    By observing the rows, what is the total cost of purchasing 3 cups of espresso, 2 cups of latte and 1 cup of cappuccino?  $      c)    By observing the rows, what is the total cost of purchasing 1 cup of latte and 1 cup of cappuccino?  $ | **Mark (3)** |

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**Section: G**Top of Form



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| **Q7:** | a)    A straight line passes through the points (7, -12) and (10, 6). Determine the value of the ***y*-intercept** of this straight line.  *y*-intercept =    b)    The quadratic equation *y* = 7*x*2 + 3*x* + 1 can be expressed in the form of a ‘completed square’ *y* = *p*(*x* – *q*)2 + *r*, where *p, q* and *r* are constants. Determine the value of *r*.  *r* =    c)    Consider the following three equations:  Equation 1: 3*x* + 5*z* = 9 + 11*y*  Equation 2: 6*x* + 10*z* = 18 + 22*y*  Equation 3: –2*x* + 11*y* – 6*z* = –7    The three equations can be expressed in tabular form as shown below in Table G1:  Table G1   |  |  |  |  | | --- | --- | --- | --- | | *x* | *y* | *z* | constant | | 3 | *a* | 5 | 9 | | 6 | *b* | 10 | 18 | | –2 | 11 | –6 | *c* |   Determine the value of *a*.  *a* =  d)    Suppose the population of a certain type of micro-organism increases by 3 times its quantity in every 30 seconds. The initial population of the micro-organism is 5. Find the population of the micro-organism at 2 minutes. | **Mark (8)** |

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**Section: H**

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| **Q8:** | a)    Consider the following equation:  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1325961452_1033397368.jpeg  If *a* = 4*k* and *b* = 2*k+8,* where *k* represents a value, what is the value of *k* ?  *k* =        b)    Subtract147 from the sum of 2007 and 37 and express your answer in its decimal form.      c)    *A, B, C* and *D* are four sets and C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1325961452_1459384367.jpegis the universal set. The number of elements in each set is shown in the Venn diagram in Figure H1, where *x* is a constant. Given that the number of elements in ( *A’* ∩ *B* ∩ *C’* ) ∪( *B’* ∩ *D’* ) is 47, determine the value of *x*. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1325961452_902143949.jpeg  *x* = | **Mark (9)** |

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**Section: I**

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| **Q9:** | In Figure I1, ABCD is a parallelogram. The equation of line BC is 2*y* = -5*x* + 100. Line AD intersects the *y*-axis at point A (0, 18). The coordinates of point D are (*t*, 2*t*).  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1297735092_-1238700439.jpeg    a)    Determine the value of *t*.  *t* =    b)    The line BC 2*y* = -5*x* + 100 intersects with another line 10*x* + 16*y* = 53 at the point (*p*, *q*). Determine the value of *q*.  *q* = | **Mark (6)** |

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**Section: J**

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| **Q10:** | a)    In a class of 40 students, 23 drink coffee, 28 drink tea and 10 drink milo. Students who drink milo do not drink tea. Find the largest possible number of students who drink tea but not coffee or milo.      b)    Given that the conversion of 2AB*b* (number with base *b*) to the hexadecimal form is 39B16, determine the value of *b*.  *b* =      c)    Figure J1 shows the dimensions of a certain grass patch, made up of two rectangles. If the total area is 133.25 m2, find the total perimeter of the grass patch in meters.  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1846428982_-1883777559.jpeg  Total perimeter = m | **Mark (9)** |

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