ACADEMIC YEAR 2023 – 2024

Program	Term	Semester	Paper
FOUNDATION	2	1	MAIN

MODULE NAME:	BASIC MATHEMATICS I		
MODULE CODE:	FMTH003	EXAM DATE:	04/02/2024
TEACHER'S NAME:	Dr. Taofeek	DURATION:	2 hrs.

Questions to be answered on:	Allowed requirements	Number of pages
Space provided on the question paper	Pen Pencil (only for drawing)	(Incl. Cover Page): 09

Points of Attention:

- For each question, the maximum earned points are mentioned between brackets at the end of each question.
- Write very clearly! Answers that are not readable are not marked and don't get points!
- Make sure your answers are written to the point.
- All answers must be written **in English**.
- Write all the answers **in blue or black pen only**.
- When finished, submit the question paper, together with the answer scripts and the signed cover page to the invigilator.
- Any cheating/copying may fail the examination.

STUDENT NAME:	
STUDENT ID:	
CLASS:	

FINAL MARKS
40

Number of answer scripts: ……

Invigilator: ……

Student's signature: ……

Time of receipt: ……

Question 1 [10 Marks]

Circle the correct option to fill in the blanks.

Example. 75 is a _____ digit number.			
a 1	**b** 2	**c** 3	**d** 4
1. If $B = [3,9]$, and $C = (-\infty, 5)$. Find $B \cap C$.			
a $\emptyset$	**b** $(-\infty, 5)$	**c** $[3, 5)$	**d** $[3, 9)$
2. The commutative property of addition to solve $x + 7 =$ _____.			
a $7 + x$	**b** $x + 7$	**c** $x7$	**d** $7x$
3. $0.052\ kg =$ _____ g			
a 0.000052	**b** 0.0052	**c** 52	**d** 5.2
4. 5π is _____ number.			
a a rational	**b** a whole	**c** a natural	**d** an irrational
5. The degree of the polynomial $x^3 - 3x^4 + 2$ is _____.			
a 0	**b** 5	**c** 3	**d** 4
6. The simplified form of the algebraic expression $(3x - 4)(3x + 4)$ is _____.			
a $9x - 16$	**b** $9x + 16$	**c** $9x^2 - 16$	**d** $9x^2 + 16$
7. The factors of trinomial $x^2 + 8x + 7$ are _____.			
a $(x + 7)(x + 1)$	**b** $(x + 7)(x - 1)$	**c** $(x - 7)(x + 1)$	**d** $(x - 7)(x - 1)$
8. $36\%\ of\ 150\ is$ _____.			
a 36	**b** 42	**c** 48	**d** 54
9. $x(y + z) = xy + xz$ follows the _____ property.			
a associative	**b** additive	**c** inverse	**d** distributive
10. The decimal form of 35% is _____.			
a 0.035	**b** 0.35	**c** 3.5	**d** 350

Question 2 [6 Marks]

Simplify the following algebraic expressions.

a. $(5x + 1)^2$ (3 marks)

b. $((x - 1) + x^2)((x - 1) - x^2)$ (3 marks)

Question 3 [5 Marks]

Find the quotient and remainder using synthetic division.

$$\frac{3x^3-12x^2-9x+1}{x-5}$$

Question 4 [4 Marks]

Simplify the below rational expression.

$$\frac{2x+1}{2x^2+x-15} \div \frac{6x^2-x-2}{x+3}$$

Question 5 [3 Marks]

If $A = \{x \mid x \geq -2\}$ and $B = \{x \mid x < 4\}$, then find the set $A \cap B$.

Question 6 [4 Marks]

Pure aspirin melts at 135℃. Find the melting point in degree Fahrenheit.

Question 7 [2 Marks]

A drop of water contains more than 53 billion molecules. Express this number in scientific notation.

Question 8 [3 Marks]

Solve the following equation.

$$2x - \frac{x}{2} + \frac{x+1}{4} = 6x$$

Question 9 [3 Marks]

Simplify the expression below and eliminate any negative exponents.

$$(8m^{-2}n^4)^3(\frac{1}{2}n^{-2})$$

Units Conversion Table

$1\ km = 1000\ m$	$1\ m = 100\ cm$
$1\ cm = 10\ mm$	$1\ kg = 1000\ g$
$1\ g = 1000\ mg$	$1\ l = 1000\ ml$
$1\ tonne = 1000kg$	$1\ cm^3 = 1\ ml$
$1\ foot = 12\ inches$	$1\ yard = 3\ feet$
$1\ mile = 1760\ yards$	$1\ gallon = 8\ pints$
$F = \frac{9}{5}\ C + 32$	$C = \frac{5}{9}(F - 32)$

Algebraic Formulas

$(A + B)(A - B) = A^2 - B^2$
$(A + B)^2 = A^2 + 2AB + B^2$
$(A - B)^2 = A^2 - 2AB + B^2$
$(A + B)^3 = A^3 + 3A^2B + 3AB^2 + B^3$
$(A - B)^3 = A^3 - 3A^2B + 3AB^2 - B^3$
$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$
$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$

MLO & Bloom's Level of Complexity

Q #	MLO Addressed	Complexity Level	Mark	Remark
1	**1,2,3,4,5,6,7**	Understanding	**10**	Expect 100% to solve
2	**5**	Understanding /Analyse	**6**	90% students can solve
3	**6**	Analyse	**5**	Expect 100% to solve
4	**2, 5**	Understanding /Analyse	**4**	Expect 80% to solve
5	**1**	Understanding	**3**	Expect 80% to solve
6	**4**	Application	**4**	Expect 100% to solve
7	**3**	Understanding /Analyse	**2**	Expect 100% to solve
8	**7**	Analyse	**3**	Expect 100% to solve
9	**3**	Analyse	**3**	Expect 100% to solve

References:

Larson, R. and Hostetler, R. (2007) *Precalculus*. 7th edn. Boston: Houghton Mifflin Company.

Stewart, J., Redlin, L. and Watson, S. (2017) *Precalculus Mathematics for Calculus*. 7th edn. Cengage.