ACADEMIC YEAR 2023 – 2024

Program	Term	Semester	Paper
FOUNDATION	1	1	Midterm

MODULE NAME:	BASIC MATHEMATICS II		
MODULE CODE:	FMTH-004	EXAM DATE:	22/10/2023
TEACHER'S NAME:	Muhammad Javed	DURATION:	1 hour

Questions to be answered on:	Allowed requirements	Number of pages
Space provided on the question paper	Pen Pencil (only for drawing)	(Incl. Cover Page): 07

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
20

Number of answer scripts: ……

Invigilator: …….....

Student's signature: ……

Time of receipt: …….....

Question 1 [5 Marks]

a. Solve the following equation for x **(2 marks)**

$$2x + 3 = 7 - 3x$$

b. Solve the following equation for radius r in term of V and h , where V is the volume of a cone with height h and radius r. **(3 marks)**

$$V = \frac{1}{3}\pi r^2 h \ ,$$

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Question 2 [4 Marks]

Find all real solutions of the equation.

$$\frac{1}{x+1} - \frac{2}{x^2} = 0$$

Question 3 [3 Marks]

A telecom company provide two schemes for the customers. First offer is \$7 per month and 3 *cent* per minute, while the second offer is \$5 per month and 8 cent per minute and this is less expensive offer. The following inequality is built for the situation.

$$7 + 0.03x \geq 5 + 0.08x$$, where x is the number of minutes.

Solve the inequality for the number of minutes. Express the solution using interval notation.

Question 4 [3 Marks]

Factorize the expression.

$x^3 + 4x^2 + x + 4$

Question 5 [5 Marks]

Helen earns \$7.50 an hour at her job, but if she works more than 35 hours in a week, she is paid $1\frac{1}{2}$ times her regular salary for the overtime hours worked. One week her gross pay was \$352.50. How many overtime hours did she work that week?

Formula Sheet

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$(a+b)^2 = a^2 + 2ab + b^2$
$(a-b)^2 = a^2 - 2ab + b^2$
$a^2 - b^2 = (a+b)(a-b)$
$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$
$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

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.