

**FINAL EXAMINATION**  
**MAR-2022**

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<b>COURSE TITLE</b>	<b>BASIC MATHEMATICS</b>
<b>COURSE CODE</b>	<b>FMAT0114</b>
<b>DATE/DAY</b>	<b>15 JUNE 2022 / WEDNESDAY</b>
<b>TIME/DURATION</b>	<b>09:00 AM - 10:30 AM / 1.5 Hours</b>

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**INSTRUCTIONS TO CANDIDATES :**

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of **3** Printed Pages including front page)

There are SIX (6) questions in this paper. Answer ALL questions in the answer booklet. (100 Marks)

1. Solve the system of equation below using matrices operation.

$$\begin{aligned}4x + 8y - 4z &= 4 \\3x + 6y + 5z &= -13 \\-2x + y + 12z &= -17\end{aligned}$$

(20 marks)

2. Find the minimum or maximum value of  $f(x)$  and sketch the graph of  $f$  given the following quadratic equation.

a)  $f(x) = -4x^2 + 4x - 1$  (10 marks)

b)  $f(x) = -x^2 - 2x + 8$  (10 marks)

(20 marks)

3. Find the partial decomposition for

$$\frac{x^2 + 2x - 8}{x^2 + x - 6}$$

(10 marks)

4. The polynomial  $f(x) = x^4 + 4x^3 + px^2 + qx - 12$  has a factor of  $(x + 2)$  and a remainder of 120 when  $f(x)$  is divided by  $(x - 3)$ . Find the value of  $p$  and  $q$ .

(10 marks)

5. Find the radian measure of  $\theta$  and the area of the sector given the

a) central angle  $\theta$  is subtended by an arc of 20 cm long on a circle with 2m radius. (10 marks)

- b) central angle  $\theta$  is subtended by an arc of 9.15 cm long on a circle with 15 cm diameter. (10 marks)

**(20 marks)**

6. Determine whether the following function is continuous or not at  $x = 3$ .

- a)  $f(x) = \frac{4x+5}{9-3x}$  (10 marks)

- b)  $f(x) = \frac{3x-2}{4x+2}$  (10 marks)

**(20 marks)**

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\*\*\* END OF QUESTION PAPER \*\*\*